Computer Based Technology (CBT) Assessment Implementation in a Nigerian Higher Institution and a Lecturer’s Work Stories: Implication for E-Counselling

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Abstract— Computer based Technology (CBT) assessment is a new practice in the conduct of examinations in Nigeria but it has its problems. Many societies have accepted information technology as the way the world is moving, therefore this study aimed at investigating Lecturers perception of innovative computer based assessment format in a Nigerian College of Education. Participants included 200 lecturers, 120 female and 80 male. The age range was between 30 and 64 years. They were randomly selected purposively from five schools in a college of Education in Nigeria. The design adopted was a cross-stage mixed-model design. Oral interview, structured questionnaire and focus group discussions were used to collect data. Measured accessibility variable showed that 98% of lecturers have access to computer. However results on the knowledge requirements and usage variable revealed that many lecturers do not have adequate ability level in the use of computer especially the chief lecturers and older lecturers. The most challenging aspect of CBT based assessment was found to be the Authoring Manager in transporting the questions to Qpack. The findings of this study has implications for E-Counselling with emphasis on CBT based assessment for optimal service delivery and international best practices in Nigerian higher institutions.

Index Terms— CBT assessment, lecturers, work stories, higher institutions.

I. INTRODUCTION

Orlich, Harder, Callahan and Gibson (2004) have described assessment as a range of activities including testing, performances, project ratings and observations. The traditional educational system is a setting whereby the teacher and the students are in the same room called classroom using board and other instructional materials to effect teaching and learning. In recent times, information and communication technology (ICT) through e-learning has made education to be more flexible. Many societies have accepted information technology as the way the world is going (Onuora-Ogunu and Nyuykonge, 2010). E-learning is the use of ICT to enhance and support teaching and learning process. Computer based technology (CBT) assessment is a new practice in the conduct of examinations and tests in Nigeria but it has its problems. It is the use of computers to administer tests and examinations in which student’s responses are electronically recorded and assessed.

Learner’s assessments are very critical in any instructional programme. To this end, assessment should be based on international best practices. Technology facilitates assessment and e-assessment has been identified as a best practice (Buzzetto-More, & Adade, 2006).

Some Nigerian higher institutions in the recent times have embraced CBT assessment for semester examinations and continuous assessment tests. This is partly because the paper and pencil test (PPT) as a method of writing examinations and tests which has been the usual practice for decades, seems to be phasing out in the international digital world and best practices. Also the attendant problems of the manual method of assessment which include examination venue-capacity, cost implication of printing examination materials, delay in the release of results, examination malpractice etc could also be the reason for the paradigm shift. Change is the only thing that is permanent and constant. But every change is expected to bring about a positive development to the society. Technology based assessment (CBT) provides opportunities to measure complex form of knowledge and reasoning that is not possible to engage and assess through the traditional PPT method (Onyibe, Nwachi-Ikpor & Abdulhakim, 2015).

However, despite the advantages embedded with the use of CBT and ICT in teaching and learning, and the introduction by higher institutions in Nigeria, it is still not well accepted by some Nigerian lecturers. There is no gainsaying that information communication technology offers new measures for assessing learning that will yield rich sources of data and expand the ways in which educators understand both learning mastery, and teaching effectiveness (Vendlinski & Stevens in Esere & Idowu, 2012). However some challenges confront implementation
of CBT assessment in most Nigerian institutions of higher learning. Baker-Eveleth et al in Onyibe, Nwachi & Abduhakim, (2015) 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. The use of ICT for test administration in Nigerian higher institutions is geared towards changing the state of test administration, but the integration has not yet been fully utilized in the nation’s higher institutions. Few authors have developed CBT applications to be used in examinations. Authors like Ayo, Akinyemi, Adebiyi and Ekon (2007) proposed a model for computer-based test in Nigeria which enforces all applicants for the Joint Admissions Matriculation Board (JAMB) examination to be subjected to online entrance examination. The model revealed that CBT has the potential to eliminate some of the problems that are associated with the paper-based test. Duruyaye and Omotehinwa, (2013) also developed computer based test application where tests in multiple choice formats could be taken online and graded immediately. These studies showed that CBT could help lecturers, instructors, teachers and others make examination an easy and less cumbersome task. However most of these applications are developed without getting the lecturers, teachers and even students intimated on how to go about it. This is in line with Olagunju (2003) who found out that secondary school teachers’ computer literacy is low.

In higher institutions in Nigeria, CBT assessment has been introduced but observations have shown that most lecturers are not quite disposed to it and this has added to other problems confronting the implementation of CBT assessment in higher institutions of Nigeria. To fully implement CBT assessment for students in the higher institutions, there is need to get the lecturers who are the facilitators of learning involved and equipped with the necessary skills and attitudes needed for the process of the new innovative CBT assessment. To this end, the present study is aimed at investigating lecturers work stories in accessibility, ability and usage of computer for CBT assessment in a Nigerian higher institution and its implication for E-counseling. To guide the study, the following research questions were raised:

1. Does Nigerian higher institution lecturers have ability to use computer?
2. To what extent does Nigerian higher institution lecturers have access to computer.
3. Does Nigerian higher institution lecturers employ ICT gadgets to enhance CBT assessment?
4. What is the lecturer’s perception of computer-based assessment in Nigerian higher institutions like?

II. METHODS

The study adopted mixed methods research approach. Mixed method is defined by Johnson & Onwuguzie, (2004) as the class of research where the researcher combines qualitative and quantitative techniques into a single study. The design is suitable for the study because of the research questions which have both qualitative and quantitative questions. In justifying their perceptions participants had to express their views, opinions as well as their feelings about CBT in higher institutions in Nigeria.

The population of this study comprised all the lecturers in higher institutions in Nigeria. However for ease of administration, one college of education was purposively selected as a case study. The participants were 200 randomly selected lecturers from the six academic schools of the institution. The sample was stratified on the basis of gender and age. There were 120 female and 80 male lecturers.

The instrument was the ‘CBT Assessment Questionnaire’ which consisted of two sections. It contained both the demographic information and the items/questions requiring respondent’s information on their accessibility to computer, their ability to use the computer, whether they employ CBT in assessment of their students and their perception to utilization of CBT and ICT gadgets in assessment. The instrument was validated by experts in Measurement and Evaluation to ensure validity. The reliability of the instrument was established through Cronbach alpha reliability technique with a co-efficient value of 0.75.

The method for data collection was a combination of administered questionnaire and focus Group Discussion (FGDs) exercise. The content of the questionnaire was a combination of close and open ended questions. Focus Group discussions produce descriptive data about people’s own written or spoken and observable behaviour.

The data were analyzed using both quantitative and qualitative format. Two main procedures were therefore applied in the analysis of the data so as to be in tandem with the mixed research approach adopted for the study. NCSS 2007 quantitative method of data analysis was used to analyze quantitative data collected from the closed-ended questions. (NCSS performs a variety of data analysis and presentation of functions, including statistical analysis and graphical presentation of data). Content analysis was used for the qualitative data collected. This involved sorting, categorizing and tallying the data which were mainly additional information to or justification of responses given to closed-ended questions in line with the mixed model design. Narrative presentation was done for some of the questions.

III. RESULTS

The biographical characteristics of the respondents are presented before the presentation of the findings related to the problem under study.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>120</td>
<td>60%</td>
</tr>
<tr>
<td>Female</td>
<td>80</td>
<td>40%</td>
</tr>
</tbody>
</table>

TABLE I.
DISTRIBUTION OF RESPONDENTS ON THE BASIS OF GENDER AND AGE.
Table 1 presents the demographic characteristics of the participants in frequency count and percentage. It shows that 60% of the study samples are males while 40% are females. Fig. 2 shows the respondents who fall within 30 – 40 years age bracket to constitute 40% of the total sample. The bar and pie charts that follow describes the demographic characteristics of the study participants.

Research Question 1: Does Nigerian higher institution lecturers have access to computer?

<table>
<thead>
<tr>
<th>S/N</th>
<th>What is the nature of your access to computer?</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Personal computer (laptop)</td>
<td>100</td>
<td>50%</td>
</tr>
<tr>
<td>2.</td>
<td>Friends</td>
<td>16</td>
<td>8%</td>
</tr>
<tr>
<td>3.</td>
<td>College internet facility</td>
<td>44</td>
<td>22%</td>
</tr>
<tr>
<td>4.</td>
<td>Library</td>
<td>08</td>
<td>4%</td>
</tr>
<tr>
<td>5.</td>
<td>Office</td>
<td>12</td>
<td>6%</td>
</tr>
<tr>
<td>6.</td>
<td>Cyber café</td>
<td>16</td>
<td>8%</td>
</tr>
<tr>
<td>7.</td>
<td>None</td>
<td>04</td>
<td>2%</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>200</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Table 2 presents lecturer’s accessibility to computer. From the table most of the respondents had one access or the other to a computer. 50% of the respondents have access to personal computer, 8% has access to their friends’ computer, 22% has access to college internet facility, only 4% has access to computer in the library, 6% has access to computer in the office while 8% has access to computer in cyber cafes. Only 2% of the respondents said they have no access to computer at all. Fig. 3 below presents the pie chart of table 2 above.

Research Question 2: Does Nigerian higher institution lecturers have the required ability to use computer?

<table>
<thead>
<tr>
<th>S/N</th>
<th>What is your rating of your ability to use computer?</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Very high</td>
<td>10</td>
<td>5%</td>
</tr>
</tbody>
</table>

The International Conference on E-Learning in the Workplace 2019. www.icelw.org
Table 3 above shows the frequency of the responses by lecturers indicating their ability in the use of computer. Only 10 (5%) out of 200 respondents have high ability in the use of computer. 20 representing (10%) of the participants have high ability. Less than half of the total sample (45%) has moderate ability while 40% of the total sample has either low or very low ability. Below is fig. 4 depicting the result in table 3.

**Research Question 3:** Does Nigerian higher institution lecturers employ ICT gadgets to enhance CBT assessment.

**Lecturers’ Employment of ICT Gadgets in CBT Assessment**

<table>
<thead>
<tr>
<th>S/N</th>
<th>Do you normally employ ICT or engage in CBT assessment of your students?</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Yes</td>
<td>40</td>
<td>20%</td>
</tr>
<tr>
<td>2.</td>
<td>No</td>
<td>160</td>
<td>80%</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>200</td>
<td>100%</td>
</tr>
</tbody>
</table>

The table above shows that 80% of the lecturers do not make use of ICT gadgets which is used for CBT assessment. Only 40 participants representing (20%) of the sample agreed to using ICT gadgets in assessment. Fig 5 further demonstrates the above result.

**Research Question 4:** What is the lecturers’ perception in computer-based technology assessment in Nigerian higher institutions like?

Focus group discussions and interviews revealed diverse opinions concerning computer-based assessment in Nigeria higher institutions. Some of the lecturers especially those in the School of Arts and Social Sciences, Languages, and Early Childhood Care and Education and Chief lecturers were of the opinion that computer based technology assessment is not very relevant to their programmes of instruction while others are constrained due to their own personal challenges in ICT literacy. The following excerpts represent a summary of ideas and opinions of the respondents:

1. **A participant respondent remarked:**
   “CBT assessment does not encourage initiative, abstract thinking and creativity’, I do not believe in it and I have never subscribed to it”.

2. **Another respondent said:**
   “CBT promotes guess work among the students, thereby making them get away with unmerited marks”.

3. **The third respondent complained thus:**
   “Computer based technology assessment seems good but the difficulty in the use of authoring manager in exporting the questions to Qpack is my problem”.

4. **Yet another respondent added:**
   “I am already used to paper and pen assessment, computer based technology assessment is an unnecessary stress”.

5. **Other respondents has the following to say:**
   “To draw the questions poses a lot of challenges as it is time consuming and stressful”.
   “Computer based assessment limits practical knowledge of the subject matter”.
   “CBT assessment is fast and machine scored, thereby reducing lecturers’ stress in marketing”.
   “I am almost out of the system and we were not trained in CBT assessment, so I think the new breed lecturers should go ahead with computer based assessment”.

![Figure 4. Percentage Distribution of Respondents Computer Requirements and Usage Index](image)

![Figure 5. Percentage Distribution of Lecturers’ Employment Gadget in Assessment](image)
9. “Many of our students are not even computer literate, so e-assessment will disadvantage some of them”.

10. “I think it is good for quizzes but should not be used for full-scale examination which require comprehensive writing”. Also it is not very good way of testing courses involving calculations.

11. “Our epileptic power supply in Nigeria do not help matters while using e-assessment. CBT assessment encounters a lot of problems so I do not encourage it all. It is better we continue with paper and pencil test”.

12. “How can I support CBT assessment when after the results are collated, the officials at the college portal tampers with my result. Intact the system is fraught with many problems and should be scrapped”.

IV. DISCUSSION

The use of information and communication technology for registering and administering examinations helps in attaining efficiency and error-free results and computations. This study revealed that 98% of lecturers have access to computer. The results further showed that only 10 (5%) of the sample have very high ability in the use of computer including the use of Authoring manager in transporting questions to Qpack for the purpose of e-assessment. 10% have high ability, while 45% have moderate ability. 30% have low ability while the remaining 10% have very low ability in the use of computer. This finding is not encouraging bearing in mind the importance of computer literacy in a globalised world. This finding aligned with Terhemba, Umani & Bintu (2016) whose study revealed a general low use of ICT by senior secondary school teachers for instructional delivery.

This is not surprising as some of the respondent’s attitude and perception showed that they are not favourably disposed toward CBT assessment. To some of them, e-assessment is not necessary and should be discouraged, since to some of them it does not test knowledge in comprehensive and integrated form. To some of them it is not a true test of knowledge; since some students get unmerited scores due to guess work. The most challenging aspect of CBT assessment in Nigerian higher institutions was found to be the use of Authoring manager in transporting the questions to Qpack. The responses of male and female lecturers did not differ much on their ability and perceptions towards computer based technology assessment. This finding is in disagreement with findings of Ogazie, Aghadinuzu & Ajoku (2017) which revealed that male teachers are more ICT complaint than female teachers, older lecturers do not consider themselves capable of using the computer as responded by some of the participants. Ogazie et al (2017) also supports this finding with their earlier findings which indicated that age poses a barrier on the effective use of ICT devices by the teachers.

V. IMPLICATIONS FOR E-COUNSELLING

Assessment in schools is geared towards finding out how much the student has acquired in terms of learning skills. E-counselling is the use of technology such as the internet, telephone, e-mail, test messages, watsapp etc in delivering service to clients. Many societies have accepted information technology as the way the world is going (Onuora-Ogunu & Nyuykonge 2010).

As the practice of computer based technology assessment is becoming popular in Nigerian higher institutions, school counselling is also expected to go online so as to meet the demands of institutions’ communities especially the lecturers. To this end, the result of the present study has implications for e-counselling practice in the nations’ higher institutions. Assessment and evaluation of students using CBT by lecturers who are not ICT complaint may pose a significant danger both on the students’ performance and the lecturers’ job satisfaction and adjustment. The lecturers need at this time to be exposed to ICT and CBT assessment skills so that they can apply such skills when administering and scoring computer based technology examinations and tests.

The institution counsellor needs to work on the lecturers’ perception and attitude especially the older lecturers and chief lecturers who see CBT assessment as unnecessary and meant for the new breed lecturers if at all it will be considered in conducting examinations. The counsellor can do this by organizing a staff forum in the institution where an expert in computer technology and CBT assessment will be invited to train the lecturers on the skills of conducting CBT examinations for their students.

E-counselling is a viable option for reaching out to clients with stressful conditions. Since most of the respondents reported that CBT assessment is stressful and should be scraped, there is need to reach out to them for help. Abbot, Klein & Ciechoniski (2008) seemed confident about the efficacy of the modality of e-counselling when they wrote that it has been found to be effective in treating a range of psychological disorders and stressful conditions. There is need for attitude change and treatment of phobia towards CBT assessment and this condition requires cognitive restructuring which can only be achieved through e-cognitive behavioural therapy. The counsellor can set up free social networking accounts with social networking and social book marking sites such as Facebook, Linkedin, Twitter, Whatsapp and Digg as a great way to promote staff counselling in the school. These sites, which have now become central to net culture, will make it easy to post information that others might find interesting and equally easy for others to share what the counsellor posted. E-counselling seems to be the most functional since school programmes may not allow the lecturers the opportunity to go to the counsellor, secondly most of them rarely go for counselling. Therefore through e-counselling the counsellor will be able to inform lecturers about the advantages and ease of using CBT assessment on their students. To catch up with the new trend in assessment (CBT), lecturers in Nigeria need to be ICT complaint so that it will enhance their practices.
The current lack of policy framework for ICT and CBT implementation in higher education system in Nigeria shows that higher education is not equipped to keep up with the ICT revolution currently sweeping the world. For Africa, particularly Nigeria to take pride of place in the committee of nations and in the scheme of things, CBT assessment must be incorporated in the curricular of higher education in the region. Okonkwo (2010) submits that electronic supported assessment or e-assessment is a field of growing importance but has yet to make a significant impact in higher institutions in Nigeria education sector. However, with e-counselling on the advantages of CBT assessment and the ease of practice, Nigerian lecturers; negative stories on the practice will definitely change to positive.

VI. RECOMMENDATIONS

The following recommendations are hereby made based on the findings:

1. Adequate funding of educational institutions by the government of the day is necessary so that lecturers could be sent on vacation courses from time to time on computer usage and its application to CBT assessment. Therefore UNESCO’s 20% budget stipulation for education of the total annual budget should be implemented by Nigerian government.

2. Public private partnership imitative should be vigorously pursued by various higher educational institutions to boost CBT assessment and e-learning capacity in terms of human and material resources.

3. In the recruitment stage, higher institution management should make it mandatory to take staff with ICT knowledge so that the process of conducting CBT assessment will not be a problem to such lecturers in future.

4. The institution guidance counsellor in collaboration with computer science departments in higher institutions should be made to organize CBT workshop once a semester to get the students and staff ready for CBT assessments in both class tests and examinations.

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