Comparison Between computer Based Test (CBT) and paper Pencil Test (PPT) in Joint Admission Matriculation Board (JAMB): Case of Yola North Senatorial Zone of Adamawa State, Nigeria.

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Abstract: Paper Pencil Test (PPT) was used to administer UTME to students who choose to apply to Nigerian public and private mono-technics, colleges of education, polytechnics and universities by JAMB since its inauguration in 1978. Computer Based Test (CBT) was introduced in 2014/2015 session in UTME and sine then it has become a thing of concern to Nigerians as a result of very low computer literacy among students in senior secondary school. This study evaluated the comparability of PPT and CBT used by JAMB to administered UTME. The geographical scope is Adamawa south senatorial zone which includes Guyuk, Numan, Demsa, Lamurde, Mayo-belwa, Shalleng, Ganye, Jada and Tongo Local Government Areas Of Adamawa State. The questionnaire administered contained 20 items as designed by the researcher. The questionnaire was administered to one thousand seven hundred and seventy five (1775) respondents from seventy one (71) schools out of 96 schools in Adamawa South senatorial Zone. Simple average method was employed to evaluate responses on the likert scale. The results

revealed that there are no adequate facilities to teach and learn computer science in schools in the selected LGAs, there are problems associated with the implementation of CBT in UMTE. The results also revealed that CBT can hinder a brilliant student who is not computer literate to pass JAMB UTME and be admitted into tertiary institution in Nigeria from schools in the selected LGAs and finally the results recommended that JAMB should make UTME optional for candidates to choose CBT or PPT.

Keywords: Computer Based Test (CBT), Paper Pencil Test (PPT), JAMB, UTME, Computer Familiarity

1.1 Introduction:

The joint admission matriculation board (JAMB) is Nigerian entrance examination board for tertiary level institutions. The examinations being administered are available for most students who choose to apply to Nigerian public and private mono-technics, polytechnics and universities. Most of these candidates must already have concluded external   examinations administer either by West Africa Examination Council (WAEC) or the Nigerian National Examination Council (NECO).

Computer Based Testing is another platform JAMB uses to administer UTME, which is obviously different from the common paper and pencil method. The Computer Base Test (CBT) did not give option for the paper and pencil base test (PPT).

Chijioke Okoronkwo, (2015) pointed out that when the Joint Admission and Matriculation Board (JAMB) mulled the idea of migrating form paper pencil test to computer based test six years ago, the proposal then elicited some apprehension. This brings lots of questions in the minds of many Nigerians. In spite the wide spread reservation about the proposal, JAMB has consistently emphasized that CBT would engender a seamless conduct of the Unified Tertiary Education Matriculation Examination (UMTE).

According to the Registrar of JAMB, Prof. Dibu Ojerinde cited security challenges, high cost of producing writing materials for the paper pencil base test, high cost of transporting materials and cubing examination malpractice as some of the reasons behind the adaptation of the CBT.

Olatunde Yemi (2013) Observed that, those who argue in favour of CBT, insist that Nigerians cannot afford to lag behind in the digital world of 21st century, while critics argue that efforts to educate candidates who are yet not tech-savvy or computer literate have been inadequate .According to Goke Adeyinka, (2015) The 2014/2015 Joint Admission and Matriculation Board Examination placement of students into various tertiary institutions across the country has thrown up several inadequacies and challenges that have made it imperative for an urgent rethink of model that has been adopted for the exercise. About 1.8 million candidates who sat for the examination were made to write the test through the use of computer (CBT). This was not the case in 2013/2014, when candidates were given an option to choose between CBT and PPBT. The time for the CBT and PPBT option in the 2013/2014 gave room for more designated centres in which candidates could write the test. It was recorded that as at 2013/2014 when PPBT was allowed alongside CBT about 4000 centers in 400 towns were available to students to choose from. This made it possible for students to write the examination in centres close their area of abode. This was not the case in the 2014/2015 exercise where the centers reduce to considerable 250. The limitation of the examination centers was such that candidates had to travel from their location to centers far away from them. In some cases, they had to travel from one town to another.

In a latest development the House of Representatives moved the motion on the need for the Joint Admissions and Matriculation Board, JAMB, to revert to Paper Pencil Test, it is imperative as stakeholders to recapitulate the pains and gains of Computer Based Test, CBT and Paper Pencil Test, PPT.

Between 1978 to 2012, JAMB had conducted yearly, its national examinations on a single Saturday using paper pencil. Thus, for 34 years, the records were there for stakeholders to cross-check the good, the bad and the ugly of JAMB. However, in 2013, the Professor Dibu Ojerinde's administration introduced the computer based test, explaining that it will correct the deficiency of the paper pencil test. Having experimented the CBT for just four years. It would be recall that last Thursday, the House of Representatives urged the Federal Government to direct JAMB to suspend the computer based 2016 Unified Tertiary Matriculation Examination test. The lawmaker while moving the motion said there is need for JAMB to revert to the paper examination until the board is ready to conduct a hitch-free Computer Based Test (CBT). It was reported that while some candidates were getting

conflicting scores in the 2016 JAMB, others were complaining of malfunctioning computers, double-option answers and sudden short down of systems causing absurdities that placed some candidates at a disadvantaged position (Vanguard 2016).

1.2.1 JAMB UTME HISTORY, STRUCTURE AND ELIGIBILITY FOR THE EXAM

The Joint admissions and Matriculation Board was established by an Act of 1978, subsequently amended in 1989 and 1993. By the virtue of the Act, the Board is empowered to be responsible for the:

i.   general control over the conduct of matriculation examinations into all Universities, Mono- technics, Polytechnics and Colleges of Education;

ii. appointment of examiners, moderators, invigilators, members of the subject panels and committees and other persons with respect to matriculation examinations;

iii. placement of suitably qualified candidates in the tertiary institutions in collaboration with those institutions.

In the 2009 University Matriculation Exam, the grading system of the normally reputable examination body was subject to serious controversy when the overall performance was one of the poorest on records. Much to JAMB's embarrassment, it was later revealed that the machines which optically graded the papers had erroneous answers and the JAMB changed some students' scores by as much as 15%. These problems had assumed new dimensions when by 1976, the then federal military government, under the leadership of General Olusẹgun Ọbasanjọ, established six additional universities. Consequently, the government set up a national committee on university entrance under the chairmanship of Mr. M. S. Angulu. In December 2013, The management of Joint Admission and Matriculation (JAMB) introduce a new system for Candidates that are applying for an admission in the higher institutions, Jamb cancelled the option of choosing at least two university as a choice, The new system will only allow an applicant to can fill one University, one Polytechnic, one College of Education and one Computer Institutes unlike before during form registration.

On 17th April 2014, The Joint Admission and Matriculation Board released her 2014 Jamb result edition for those that registered for her Pencil and Paper examination type. The statistic showed

that over a total number of 990,179 candidates registered for Pencil and Paper examination type while 25,325 candidates registered for CBT which amounts to 1,015,504 applicants". And out 36,164 were taken as invalid results and 37,315 are for students who were absent on the exam date. 2,494 results were withheld due to various examination malpractices. The Joint Admission and Matriculation board stated the commencement of computer base test starting from the 17th of May 2014 to the 31st of May 2014.

1.2 .2 ELIGIBILITY FOR THE EXAMINATION

Those eligible to sit the UTME are holders of the following qualifications or their equivalents:

  i.   the West African School Certificate (WASC)
 ii.   the Senior Secondary School Certificate (SSCE)
iii.   the National Technical Certificate or the National Business Certificate (NTC/NBC)
 iv.   Teachers' Grade II Certificate

Candidates who have sat or are scheduled to sit for examinations in any of these qualifications in the year of application may also sit for the UTME. (JAMB,2016).

1.3 Statement of the Problem

The Computer Base Test (CBT) is a platform introduced by the board to the conducting UTME examination instead the normal Paper Pencil Test (PPT) as a way to reduce and curtail the nefarious activities in the aspect of looking for all possible ways of abating cheating, solving security problems and reducing cost.

However there are short comings such as server and power failure. Denials of right of choice of types of examination, limited CBT centers, problem of state of student's computer literacy and accessibility ,inadequate computers and internet facilities in public and private secondary schools, and inadequate preparation for proper implementation by JAMB. Comparative statistic results shows that in 2013/2014 over a total of number of 990,179 candidates registered for the paper and pencil test examination type while 25,325 candidates registered for computer base test which amounted to 1,1015,504 applicant Aja Anayo (2015). The registrar/chief executive of

JAMB prof. Dibu OJerinde in Abuja while announcing the release of the 2014 UTME results said that only 24 candidates scored 250 and above in the paper and pencil test (PPT) while 23 candidates scored 250 and above in the computer base test (CBT). In 2015/2016 JAMB forced all candidates writing the UMTE to take the CBT regardless of distance and level of computer literacy among many Nigerians students.

2. REVIEW OF RELATED STUDIES

Mazzeo and Harvey (1988) provided one of the earliest reviews, which included some 30 comparability studies about a range of tests such as ones focusing on intelligence, aptitude, personality, and achievement. Their study revealed mixed evidence concerning the comparability of CBTs and PPTs. They found test mode seemed to have no effect on power tests, but a considerable effect on speeded tests. In a related development Mead and Drasgow (1993), who used meta-analysis to examine the mode effect on timed power tests and speeded tests, arrived at a similar conclusion? However, in a meta-analysis of ability measure tests performed by Kim (1999), CBTs and PPTs were found to have comparable average scores. Although the majority of recent comparability studies have indicated that CBT and PPT are comparable across delivery medium, the results are not unanimous. The inconsistency in the findings is not surprising, given that these comparability studies involve a wide range of variations in content areas, participants, data collection designs, and item format. A comparative study by Yurdabakan (2012) revealed that even though computer accession opportunities increase student's computer competences and achievement. (Bennett, et al 2008) contributed that it is possible to evaluate that such approaches could be the reason of students limited accession opportunities. Leeson (2006) Identifies the factors that led to difficulties in CBT application under two titles, as factors originating from users and technology used. He pointed out 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. A similar study was conducted by Berner (2003) on the importance of computer competency in determining students and teachers attitude towards ICT. The results of his study revealed that computer competency was most significant predictor of students and teacher's interest in using computer in education. Isleem (2003) carried out a research on Ohian technology education teachers, the results revealed that computer competence and experience were the strongest predictors of attitudes towards computer use and taking CBT.

3 METHODS AND MATERIALS

Since the inauguration of JAMB in 1978, it has been administering UMTE through Paper Pencil Test (PPT) for students seeking for admission into Nigerian public and private mono-technic, colleges of education, polytechnics and Universities.. Comparison between the CBT and PPT in JAMB UMTE became necessary so as to ascertain whether the CBT is embraced by candidates in public senior secondary school, to ascertain the availability and adequacy of computer laboratories and internet facilities nationwide in administering Computer Based Test (CBT), to determine the availability of computer facilities and human resources in teaching and learning of computer science in senior secondary school and creates an awareness to students opinion on JAMB CBT and PPT.

The area of study include senior secondary schools in yola senatorial zone .These include, Tongo ,Ganye,Jada ,Mayo belwa ,Demsa ,Numan, Shelleng, Guyuk, and lamurde. The plopulation of the study includes all final students in senior secondary school, and JAMB Officials. A sample of 1775 respondents is selected with a design to have each of the 71 schools sampled to the respondent. A sample of 71 schools was selected out of total number 96 schools in the selected local Government Area. Sample allocation per school is done using proportion of schools in each of the selected Local Government Areas (LGAs).

TABLE: 1.Sample of schools per local government in Adamawa South Senatorial Zone.

S/N	Sampled local government area	Total No. of schools	School sampled based on proportion of the selected
1	Demsa	15	11
2	Guyuk	9	6
3	Ganye	11	8
4	Jada	15	11
5	Mayo belwa	14	10
6	Shelleng	9	6
7	Lamurde	9	6
8	Numan	15	11
9	Tango	3	2

Source: Adamawa State Post Primary Schools Management Board 2016

A sample average is used to interpret result and Microsoft excel would be used to bring out the and bar chart.

Key questions sampled.

1. We have adequate facilities to teach and learn computer science in my school.
2. This school makes computer science a compulsory subject to all students.
3. There are problems associated with the implementation of CBT in UTME exams.
4. CBT in UTME exams can hinder a brilliant candidate who is not computer literate to gain admission into tertiary institution in Nigeria.
5. JAMB should make UMTE exams optional to all candidates to choose CBT or PPT

4.1 Result and Discussion

Table 2 : Summary of the opinion by 1775 respondents in line with the key questions

Key Questions	SD	D	UD	A	SA
1	936	603	2	177	57
2	352	316	3	381	723
3	101	118	0	346	1210
4	80	79	0	692	924
5	53	82	1	528	1111

While SD, D, A, SA and UD stands for Strongly Disagree, Disagree, Agree, Strongly Agree and Undecided, 1 to 5 represents the following questions respectively.

Ranking:

5- SD=Number of response

4- D=Number of response

3- UD=Number of response

2- A- Number of response

1-SA= Number of response

Where N=1775

Average=   5(SD)+4(D)+3(UD)+2(A)+1(SA)

_____

                                    N

4. 2 Key questions and Discussion

1. **In response to the question: We have adequate facilities to teach and learn computer science in my school using a simple average method**

Table 3: Adequate facilities to teach and learn computer science

Key Questions	SD	D	UD	A	SA
1	936	603	2	177	57

5(936)+4(603)+3(2)+2(177)+1(57)

_____

              1775
              =4.23

Based on the ranking the likert scale from 5 to 1 for SD to SA respectively. Having computed their average responses we arrived at 4.23 which is close to 4 on the ranking and 4 signify Disagreement to the assertion. This affirmed that there are no adequate facilities to teach and learn computer science in schools in the selected LGAs

2. **In response to the question: This school makes computer science a compulsory subject to all students using a simple average method**

Table 4: Computer is a compulsory subject in the school

Key Questions	SD	D	UD	A	SA
2	352	316	3	381	723

5(325)+4(316)+3(3)+2(381)2(732)
_____

1775

= 2.55

Based on the ranking the likert scale from 5 to 1 for SD to SA respectively. Having computed their average responses we arrived at 2.55 which is close to 2 on the ranking. And 2 signify Agreement to the assertion. This affirmed that the schools make computer science a compulsory subject to all students in the selected LGAs.

3. **In response to the question: There are problems associated with the implementation of CBT in UTME exams. Using simple average method**

Table 5: Problems associated with the implementation of CBT in UTME

Key Questions	SD	D	UD	A	SA
3	101	118	0	346	1210

5(101)+4(118)+3(0)+2(346)+1(1210)
_____

1775

=1.62

Based on the ranking the likert scale from 5 to 1 for SD to SA respectively. Having computed their average responses, we arrived at 1.62 which is close to 1. And 1 signifies Strongly Agreed to the assertion. This affirmed that there are problems associated with the implementation of CBT in UTME in schools in the selected LGAs

4. **In response to the question: CBT in UTME can hinder a brilliant candidate who is not computer literate to gain admission into tertiary institution in Nigeria.**

Table 6: CBT can hinder a brilliant candidate who is not computer literate to gain admission.

Key Questions	SD	D	UD	A	SA
4	80	79	0	692	924

$$\frac{5(80)+4(79)+3(0)+2(692)+1(924)}{1775}$$
$$=1.70$$

Based on the ranking the likert scale from 5 to 1 for SD to SA respectively. Having computed their average responses we arrived at 1.70 which closes to 1 on the ranking. And 1 signifies Strongly Agreed to the assertion. This affirmed that CBT in UTME can hinder a brilliant candidate who is not computer literate to gain admission into tertiary institution in Nigeria in schools in the selected LGAs.

5. In response to the question: JAMB should make UMTE exams optional to all candidates to choose CBT or PPT

Table 7: CBT should be optional to students writing UTME

Key Questions	SD	D	UD	A	SA
5	53	82	1	528	1111

$$\frac{5(53)+4(82)+3(1)+2(528)+1(1111)}{1775}$$
$$=1.55$$

Based on the ranking the likert scale from 5 to 1 for SD to SA respectively. Having computed their average responses we arrived at 1.55 which is close to 1 on the ranking. And 1 signifies Strongly Agreed to the assertion. This affirmed that JAMB should make UMTE optional all candidates to CBT or PPT.
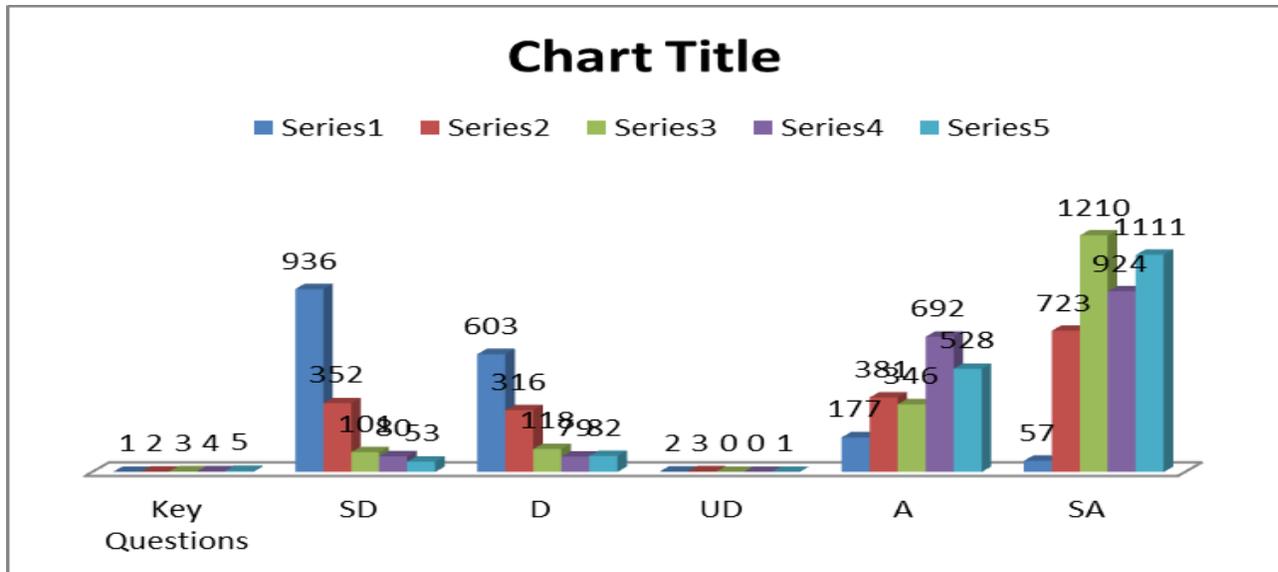
Figure 1: Summary of responses

Conclusion

The results revealed that there are no adequate facilities in the teaching and learning of computer science in schools in the selected Local Government Areas to enable students adequately prepare for CBT exams, the result also revealed that there are problems associated with the implementation of the CBT in UTME as experienced by candidates who took the CBT exams. The result also shows that CBT in UTME can hinder a brilliant candidate who is not computer literate to gain admission in Nigerian colleges of education, polytechnics and universities and finally the study revealed that students in schools in the selected Local Government Areas prefers Paper Pencil Test (PPT) and are at the opium that JAMB should make UTME optional to candidates to choose Computer Based Test (CBT) or Paper Pencil Test (PPT).

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