International Journal of Quantitative and Qualitative Research Methods
Vol.8, No.2, pp.25-33, May 2020
Published by ECRTD-UK
ISSN 2056-3620(Print), ISSN 2056-3639(Online)

FACTORS INFLUENCING STUDENTS' PERFORMANCE IN COMPUTER BASED TESTING IN CROSS RIVER STATE, NIGERIA (POWER SUPPLY & INADEQUATE COMPUTERS)

Bassey, Akaase Blossom N. Ph. D
Department of Educational Foundations and Childhood Education
Cross River University of Technology (CRUTECH)Calabar.
Cross River State, Nigeria.
blossomalltheway41@ gmail.com

ABSTRACT*: The main purpose of this study was to investigate Factors influencing students' performance in computer based testing in Cross River State, Nigeria. To achieve the purpose of this study, two hypotheses were formulated to guide the study. Literature related to the variables under this study is reviewed accordingly. Survey research design was adopted for the study. A sample of 200 students were randomly selected for the study. The selection was done through the simple random sampling technique. The questionnaire was the main instrument used for data collection. To test the hypotheses Pearson product moment correlation analysis statistical technique was adopted. The .05 level of significance was used for the statistical testing of each of the hypothesis. The result of the analysis revealed that, power supply and inadequate computers significantly relates with students' performance in computer based testing. Based on the findings of the study, it was recommended that there should be provision of more computers for UTME and enhancement of power supply by the Government, posting of candidates close to their homes and postponement of use of CBT for UTME by JAMB till the identified challenges have been curbed.*

KEYWORDS: computer based testing, power supply, inadequate, computers

INTRODUCTION

Examination and testing is an important part of the teaching/learning process of education which allows the teacher to evaluate students during and at the end of the courses. Tests determine the extent to which the educational objectives set by the teacher have been achieved. Tests can also help the teacher to evaluate students and assess them to find out whether they are learning what is expected of them. In most schools, the examination and testing method used to assess students' academic progress is paper-pencil based tests. Fortunately the rapid advancement of Information and Communication Technologies (ICTs) in teaching/learning has shifted the paradigm from paper-pencil based to computer-based test system of examination (Uysal&Kuzu, 2009).

Honey and Hilton (2011) affirmed that computer-based assessment has the ability to foster different kinds of skills such as scientific processing in the students and also the ability to design and execute scientific investigations. Among other advantages, computer testing is more efficient than paper-based tests because it also offers year-round testing, flexibility in scheduling and faster score reporting. Computer-based testing (CBT) has been found to have a lot of benefits with respect to the administration of test. Such benefits include improved security, access to interactive items formats and immediate scoring. The computer offers an

opportunity for flexible scheduling where the examinees can take tests individually at virtually any time. Examinees are given feedback on the correctness of the response to each question as they are taking the test. Despite the numerous advantages of the CBT potential problems also exist. The use of the response entry device, whether keyboard, touch screen or mouse can introduce errors. Examinees due to anxiety can press the wrong key in response to questions which can result in an error thereby compromising the validity of the examinee's result. The time lag between an individual's answer and the resulting response from the computer can also create some problems. According to Mills (2000), long time lags between responses can result in negative user attitudes, anxiety and poor performance. Examinees could supply correct answers that are not recognized by the computer which may result to lower reliability and poorer discrimination indices. In Nigeria, many candidates who sat for the 2015 Unified Tertiary Matriculation Examination (UTME) were faced with the challenge of abrupt shutting of computer systems and thumbprints that did not match what was filled, thus forcing them back home dejectedly without writing their tests. The issue of candidates not able to access the JAMB website and the due accreditation of candidates not done until few days to the exams cannot be in the interest of the candidates. Some of JAMB staff took money from the candidates and contributed in the chaotic situation that endangered the lives of many of the candidates who came to sit for the exam. According to Punch (20th March 2015), it is a nightmare for thousands of candidates taking this year's Unified Tertiary Matriculation Examination across the country, using the newly-introduced Computer-Based Test format. Reports of a dearth of computers, failure of internet servers, power failure, slow booting of computers, loss of time in the process, and offering candidates' subjects they never registered for are widespread. Worse still, JAMB exposed the candidates to extreme danger and unnecessary stress by fixing some of the tests at 6.00am. In Lagos, Nigeria where the difficulties were expected to be minimal, the shortages of CBT centers were well pronounced to the point that JAMB had to register some candidates in neighboring states of Ogun, Osun and Kwara. Many others from Lagos travelled to the border town of Badagry, a journey of about four hours in order to sit for the exam. Candidates that were to sit for the exam on March 12 at Command Secondary School, Ipaja, Lagos, learnt of the change of venue to the WAEC Agidingbi office, Ikeja, only when they had reported at the former.

Oduntan, Ojuawo and Odunntan (2015), define computer based tests as "assessment that are administered by computer in either standalone devices linked to the internet or world-wide web (www.), most of them using multiple choice questions." Abubakar and Adebayo (2014) opine that some major reasons for introducing CBT tests for UTME were to inhibit the rate of examination misconduct and also to speed up the release of results. The stance of this paper is that these reasons can be accepted as tangible if results produced using CBT forms are satisfactorily valid and reliable. Test validity is described as the extent to which a tests measures what it is designed to measure and nothing else. The purpose of organizing Unified Tertiary Matriculation Examination for candidates is to be able to select candidates who will be capable of coping with tertiary education scheme of work. Test credibility is the extent to which the test result is accepted as authentic by relevant authorities. Nwana (2007), further states that for a test to achieve the purpose for which it designed (test validity) there must be test civility. Test civility is the degree to which the conditions under which candidates are made to take an exam or test is devoid of challenges which can affect candidates' performance in the test. Some of such challenges are: insufficient, accommodation, facilities, equipment, materials and incompetence in use of equipment provided for taking the test. Exams taken

under conditions which lack test civility would measure psychological stresses encountered by the candidates during the examination, instead of measuring their ability in the objectives or skills the test is designed to measure. For instance, UTME will lack validity if a candidate who is not competent in use of computer fails the exam because of his incompetence in the use of computer rather than his/her inability in the objectives the test is designed to measure. Furthermore, a standardized test like UTME should be conducted with uniform administrative procedure. All candidates should be given uniform exam schedule.

According to Annastasi (1988:25), in Nkwocha (2015),"standardization implies uniformity of procedure in administering and scoring the test" Fixing the exam for some candidates in the morning and compelling some to take theirs in the night may give undue advantage to some candidates more than to others. It goes against the principle of standardization of a test. In 2012 when JAMB introduced CBT and DBT forms for UTME, candidates were given the opportunity to use paper /pencil, CBT or DBT forms of the exam. Similar opportunities were given in 2013 and 2014 sessions. In 2015 UTME, JAMB authority restricted every candidate to use of computer based test format. Introduction of CBT exams has attracted comments from researchers like Adebayo (n.d) Oduntan, Ojuawo and Oduntan (2015) and Abulakar and Adebayo (2014). Adebayo, (2015) noted that some candidate failed CBT form UTME exam because of incompetence in use of computer and also noted that the epileptic power supply and poor level of economic situation in Nigeria are challenges that hinder effective use of CBT for UTM examinations in the present Nigerian situation. JAMB 2015 UTME experience: Advantages and disadvantages, record that candidates who took UTME in UNIPORT using CBT complained that systems were 'doing off and on magic' and that the systems were insufficient. Some candidates got fatigued as they waited for their turn to use the computer and no JAMB official attended to people's complaints. Adebayo (2014) identified power failures as a problem encountered in computer based tests in Nigeria. The coordinator, JAMB office, Owerri also reported that in the recently concluded 2015 UTME , a faulty generator at a center in Owerri zone one, damaged the computer systems in the center, the candidates in the center were directed to transport themselves quickly to a center in Orlu where they took the exam. It is noteworthy that statistics obtained from the office of the Director, JAMB office Abuja, reveals that eighty-two thousand four hundred and forty-four candidates(82,445) took UTME in the whole of Imo state which is called Owerri JAMB zone one. Only twenty-two (22) computer centers were made available for the 82,445 candidates. In Owerri senatorial zone which consists of five local governments, forty-five thousand five (45,005) candidates took JAMB in 2015. Only twelve computer centers were provided for them. Majority of the centers did not have more than 150 computers.

As narrated by the coordinators, JAMB office Owerri, to forestall some anticipated problems during the 2015 exam, JAMB engaged the services of supervisors, technical staff, proctors, centre managers, centre technical staff, generator maintenance staff, computer engineers and security personnel. The examination was run for two weeks, and conducted daily in three sessions. The first session commenced at 6am while the last session ended in the evening. CBT tapes which could be used for practice were made available for purchase to candidates before the exam date. Nonetheless, for JAMB Management, the arrangements made so far was sufficient to make 2015 CBT, UTME in Owerri hitch free and capable of producing valid results. No wonder only CBT computer based tests were made available to candidates for 2015 UTME in Owerri zone one. The problem of this study therefore is: Were challenges

capable of inhibiting test validity still encountered by candidates during the 2015 CBT UTME in Owerri Senatorial Zone one? Based on this backdrops, the purpose of this study was to investigate the challenges encountered by candidates who used CBT for 2015 UTME in Owerri Senatorial zone one and explain the implications of any challenge encountered on test validity. The study specifically investigated the extent to which the following challenges were encountered during the 2015 UTME exam in Owerri zone one: Power failure, problems posed by insufficient supply of computers, candidates‟ lack of competence in use of computer, lack of adequate assistance for candidates who had technical hitches, non- functional computers, problems caused by posting candidates far from their residences, provision of more favourable exam sessions for some candidates more than others. If the recommendations made by this study to curb the challenges encountered during the 2015 UTME examination in Owerri Zone one are implemented, the study would be beneficial to candidates who take UTME because conducive environment which will ensure test civility will be provided for them. It would be too relevant to university authorities because the result of UTME would be more valid and enable them select appropriate candidates for admission. It would be relevant to the society at large as more efficient graduates would be produced. Considering the purpose of the study the following research questions guided the study.

Other challenges militating against the full adoption of CBT in Nigeria and other developing countries are: Inadequate ICT infrastructure including hardware, software and bandwidth accessibility. Obioma et al. (2013) observed that much of the infrastructures for automated examinations are either obsolete or overstretched in terms of capacity, accessibility, reliability and security. Again, the absence of internet facilities in our rural areas requires students travelling long distances to urban centres to have access to internet. Broadband penetration needs to be fast-tracked to reduce the cost of internet bandwidth access in Nigeria.

Students/candidates inadequate skills in ICT: Many school leavers in the country are not computer literate. Even many teachers in the primary and secondary schools cannot boot a computer not to talk of using any application. With these ‘analogue’ teachers to impart ICT skills to students, definitely the students cannot be adequately equipped for CBT. And this anxiety explains why the resistance to JAMB’s full use of CBT in 2015 UTME by students, parents and even teachers. Nigeria does not only lack ICT infrastructure, it also lacked the human skills and knowledge to fully integrate ICT into secondary school education (Ilesanmi & Lasisi, 2015).

Integrity of examination managers: Outside tertiary institutions ICT centres, other CBT centres in Nigeria are privately owned cyber-café. One of the key reasons advanced for migrating from PPT to CBT is to curb the rampant cases of examination malpractices in the country, the integrity of these businessmen in adhering to the laid down procedure for biometric data capturing during registration and verification during examination cannot be guaranteed. Experience in SSCE examination has shown that most of the privately owned schools are for pure economic gains leading to all sorts of examination malpractices.

These exam ‘miracle’ centres syndrome may be transferred to CBT centres if urgent measures is not taken. All tiers of government in collaboration with corporate organization through public-private partnership (PPP) should build, equip and maintain standard CBT centres at

least four in each of the 774 local government areas in the country. This will facilitate e-examination in the country and ensure fairness and equity to the examinees.

Acceptability: There are series of reasons different stakeholders are kicking against automation of examination in Nigeria. Aduwa-Ogiegbaen and Iyamu (2005) cited in Obioma et al. (2013) observed that for teachers and educators, job-roles and control are major reasons for resisting automated assessment. They argued that since automated assessments are likely to facilitate a more independent approach to learning for students, teachers who see themselves as "expert that translate knowledge in the classroom" are challenged and consequently resist its uptake in their classroom practices. For school proprietors and other education services providers, economic factor may be the reason for resisting the uptake of CBT. Ilesanmi & Lasisi (2015) noted that ICT has remained a low financial priority in most educational systems in Africa. To conserve fund that would be used to acquire computers, internet facilities and other needed infrastructure, some school proprietors may want to evade the positive change CBT has brought to our educational system. For candidates and students, poor ICT skills could be the only genuine reason for not embracing CBT in this era.

School curriculum and education standard differ from one country to the other. Alokan (2010) observed that assessment of student knowledge and skills within a web browser window or delivered by bespoke assessment software (specifically crafted for a particular set of questions) provides a restricted environment which prevents the demonstration of abilities associated with the use of specialist software or a combination of applications. Again, a corrupt software or network failure can cause rescheduling of the examinations.

Despite the efforts by various authorities above, there is still a gap that is left unfilled that bothered this study. This includes how power supply and inadequate computers significantly relates with students' performance in computer based testing in Cross River State, Nigeria hence, the necessity of this study.

The following hypotheses were formulated to guide the study.
There is no significant relationship between power supply and students' performance in computer based testing.
There is no significant relationship between inadequate computers and students' performance in computer based testing.

RESEARCH METHODOLOGY

The research design used for this study is survey research design. Survey research is very useful for opinion and attitude studies. It depends basically on questionnaires and interviews as means of data collection. The survey research design is economical in the sense that a study of representing samples will permit inferences from generalization to populations that could be too expensive to study as a whole. As the topic indicated, the research area for this study is Cross River State – Nigeria. Cross River State is one of the thirty-six (36) states of the Federal Republic of Nigeria, and it has 18 Local Government Areas. The state was divided into one hundred and ninety six (196) electoral wards by the National Electoral Commission (INEC). The state is situated in the south-south geopolitical region of Nigeria. The state lies between latitudes $5^0$32' and $4^0$27' North of the Equator and longitudes $7^0$50' and $9^0$28' East

of the Greenwich meridian. It is bounded in the North by Benue State, in the south by Bight of Bonny and Atlantic Ocean, in the East by the Cameroon and in the West by Abia, Akwa Ibom, and Ebonyi States. The sampling technique adopted for this study was the simple random sampling technique. Simple random sampling technique is a means by which researchers give every member of population equal and independent opportunity of being selected. The sample size for this study was (200) two hundred secondary school students in the study area. The questionnaire was the instrument used for data collection. The instrument was divided into two sections A and B. Section A is for respondents' personal data. Section B consists of 24 items four point likert type ranging from: Strongly Agree (SA) to Strongly Disagree (SD) to measure the variables under study. The validity of the instrument were examined by two experts in test and measurement assessed the items and certified that the instrument is capable of measuring the variables in the study. To determine the reliability of the instrument (questionnaire) a trial testing was done using twenty (20) students draw from the population area who were not part of the real study. Test retest method of reliability was used to determine the reliability estimate of the instrument. The reliability coefficient is ranges from 0.79 to 0.82.

Presentation of results

In this section each hypothesis is re-stated, and the result of data analysis carried out to test it is presented. Each hypothesis of the study was tested at .05 level of significance.

Hypothesis one.

There is no significant relationship between power supply and students' performance in computer based testing. The independent variable in this hypothesis is power supply; while the dependent variable is students' performance in computer based testing. To test this hypothesis, Power supply and students' performance in computer based testing was correlated using Pearson Product Moment Correlation Analysis. The result of the analysis is presented in Table 1.

TABLE 1

Pearson Product Moment Correlation Analysis of the relationship between Power supply and Students' performance in computer based testing (N=200)

Variables	$\bar{X}$	**SD**	$\sum X$ $\sum Y$	$\sum X^2$ $\sum Y^2$	$\sum XY$	**r-value**
Power supply	21.93	1.12	4386	5342	130761	0.43*
Students' performance in computer based testing	21.23	1.85	4246	5161		

* Significant at .05, critical r = .138, df = 198

The result of the analysis as presented in Table 1 revealed that the calculated r-value of 0.43 is higher than the critical r-value of .138 at .05 level of significance with 198 degree of freedom. With the result of this analysis, the null hypothesis which stated that there is no significant relationship between power supply and students' performance in computer based testing was rejected. This result implies that, power supply has a significant positive relationship with students' performance in computer based testing.

Hypothesis two

There is no significant relationship between inadequate computers and students' performance in computer based testing. The independent variable in this hypothesis is inadequate computers; while the dependent variable is students' performance in computer based testing. To test this hypothesis, students' performance in computer based testing was correlated with their inadequate computers using Pearson Product Moment Correlation Analysis. The result of the analysis is presented in Table 2.

TABLE 2

Pearson Product Moment Correlation Analysis of the relationship between inadequate computers and Students' performance in computer based testing (N=200)

Variables	$\overline{X}$	**SD**	$\sum X$ $\sum Y$	$\sum X^2$ $\sum Y^2$	$\sum XY$	**r-value**
Inadequate computers	21.07	1.89	4214	5089	163233	0.87*
Students' performance in computer based testing	21.23	1.85	4246	5161		

* Significant at .05, critical r = .138, df = 198

The result of the analysis as presented in Table 2 revealed that the calculated r-value of 0.87 is higher than the critical r-value of .138 at .05 level of significance with 198 degree of freedom. With this result, the null hypothesis which stated that there is no significant relationship between inadequate computers and students' performance in computer based testing was rejected. This result indicated that, inadequate computers has a significant positive relationship with students' performance in computer based testing.

DISCUSSION OF FINDINGS

The result of the first hypothesis revealed that there is a significant positive relationship between power supply and students' performance in computer based testing. The finding of this hypothesis is in line with the view of Adebayo, (2015) noted that some candidate failed CBT form UTME exam because of incompetence in use of computer and also noted that the epileptic power supply and poor level of economic situation in Nigeria are challenges that hinder effective use of CBT for UTM examinations in the present Nigerian situation. JAMB 2015 UTME experience: Advantages and disadvantages, record that candidates who took UTME in UNIPORT using CBT complained that systems were 'doing off and on magic' and that the systems were insufficient. Some candidates got fatigued as they waited for their turn to use the computer and no JAMB official attended to people's complaints. Adebayo (2014) identified power failures as a problem encountered in computer based tests in Nigeria. The coordinator, JAMB office, Owerri also reported that in the recently concluded 2015 UTME , a faulty generator at a center in Owerri zone one, damaged the computer systems in the center, the candidates in the center were directed to transport themselves quickly to a center in Orlu where they took the exam. It is noteworthy that statistics obtained from the office of the Director, JAMB office Abuja, reveals that eighty-two thousand four hundred and forty-four candidates(82,445) took UTME in the whole of Imo state which is called Owerri JAMB zone one. Only twenty-two (22) computer centers were made available for the 82,445 candidates. In Owerri senatorial zone which consists of five local governments, forty-five thousand five

(45,005) candidates took JAMB in 2015. Only twelve computer centers were provided for them. Majority of the centers did not have more than 150 computers. As narrated by the coordinators, JAMB office Owerri, to forestall some anticipated problems during the 2015 exam, JAMB engaged the services of supervisors, technical staff, proctors, centre managers, centre technical staff, generator maintenance staff, computer engineers and security personnel.

Power failure, problems posed by insufficient supply of computers, candidates‟ lack of competence in use of computer, lack of adequate assistance for candidates who had technical hitches, non- functional computers, problems caused by posting candidates far from their residences, provision of more favourable exam sessions for some candidates more than others. The result of the second hypothesis revealed that there is a significant positive relationship between inadequate computers and students' performance in computer based testing. The finding of this hypothesis is in line with view Obioma et al. (2013) observed that much of the infrastructures for automated examinations are either obsolete or overstretched in terms of capacity, accessibility, reliability and security. Again, the absence of internet facilities in our rural areas requires students travelling long distances to urban centres to have access to internet. Broadband penetration needs to be fast-tracked to reduce the cost of internet bandwidth access in Nigeria. Inadequate ICT infrastructure including hardware, software and bandwidth accessibility.

CONCLUSION

There are also a lot of challenges which affect the validity of the tests. Based on the findings of the study it was concluded that power supply and inadequate computers significantly relates with students' performance in computer based testing. For CBT to be valid, these challenges must be overcome in order for computer-based testing to be effective for large-scale state assessments.

Recommendations

Based on the findings, the following recommendations were made.

1. Efforts should be made by the Government to supply functional computers in secondary schools and ensure that both teachers and students are adequately trained to be computer literate.
2. The Government should also ensure constant power supply.
3. Faulty computers should be repaired before the exam.
4. JAMB officials should be trained for high expertise computer knowledge.
5. Service providers should ensure high level of internet connectivity by providing multiple servers.
6. Examinations should not be scheduled as early as 6a.m.
7. Construction of more computer centers, provision of more computers for UTME and enhancement of power supply by the Government, posting of candidates close to their homes and postponement of use of CBT for UTME by JAMB till the identified challenges have been curbed.

REFERENCES

Abubakar, A.S. & Adebayo O, F.O. (2014). Using computer based test method for the conduct of examination in Nigeria: Prospects, challenges and strategies. Mediterranean journal of Social Sciences, 5(2) 47 ISSN 2039-2117 retrieved http://www.nuhafoundationorg/home/biog/bioggingentries/2013/adultchangingthemode07.conductingexaminationsinNigeriabuazie.

Adebayo, F.(n.d). Candidates list out the advantage and disadvantages for computer-Based UTME Retrieved May, 2015 from www.google.com

Aduwa-Ogiegbaen, S. E., & Iyamu, E. O. S. (2005). Using Information & Communication Technology in Secondary Schools in Nigeria: Problems and Prospects. *Educational Technology and Society*, 8(1), 104-112.

Alokan, F.B. (2010). Influence of Sex and Location on Relationship between student problems and Academic Performance. *The Social Sciences (TSS)*, 5(4), 340 – 345.

Annastasi (1988:25) Identifying Reading Problems with Computer- Adaptive Assessments. Journal of Computer Assisted Learning, 23 (1), 27-35.

Honey, M. A. & Hilton, M. (2011). Learning science through computer games and simulations. Washington, DC. The National Academic Press.

Ilesanmi & Lasisi, 2015) Speed and Performance Differences among Computer- Based and Paper- Pencil Tests. Journal of Educational Computing Research, 31 (1), 51- 60.

Mills R. A. (2000), "The Use of Computer Based Testing Method for the Conduct of Examinations at the University of Ilorin", *International Journal of Learning & Development*, ISSN 2164-4063 2012, 2(3), 56- 3.

Nkwocha, P.C. (2015). Basic educational measurement and evaluation: Revised edition. Owerri: Mercy Divine Publishers.

Nwana,O.C.(2007).Text book on Educational Measurement and Evaluation, Owerri:BomaWay Publishers.

Obioma, S. M. & Robinson, D. H. (2013). Speed and Performance Differences among Computer- Based and Paper- Pencil Tests. Journal of Educational Computing Research, 31 (1), 51- 60.

Oduntan, O.E, Ojuawo O.O. & Odutan E.A (2015). A comparative analysis of students' performance in paper/pencil test (PPT) and computer based test (CBT) Examination system. Research Journal of Education studies and Review, (I) 24-29. Retrieved May 2015 from www.google.com.

Oye, C. & Tymms, P. (2011). Identifying Reading Problems with Computer- Adaptive Assessments. Journal of Computer Assisted Learning, 23 (1), 27-35.

Uysal, O. & Kuzu, A. (2009). A Thesis Proposal. Quality Standard of Online Higher Education in Turkey. Internationalization and the Role of University Networks. Proceedings of the 2009 EMUNI Conference of Higher Education and Research, Potoroz, Slovenia, 25- 26September. Retrieved December 25, 2010 from http://www.emuni.si/Files//Denis/Conference/EMUNI_HE-R/Proceedings/Papers/48.pdf