

Assessment of Senior Secondary School Students Problems in the use of Computer –Based Test (CBT) in Delta Central Senatorial District of Delta State

Isaac D.T^a, Yobolo A.S^b, Aghegho. I^c

a, b, c Department of Guidance and Counseling (Measurement and Evaluation Unit), Delta State University, Abraka, Nigeria

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Abstract: This study focused on the assessment of senior secondary school students' problems in the use of CBT in Delta Central Senatorial District of Delta State. The study investigated CBT problems encountered by senior secondary school students. To achieve this purpose, three (3) research questions and three (3) hypotheses were formulated to guide the study. Theoretical and empirical findings of related literature were reviewed. Ex-post facto research design was adopted in the study. The sample consisted of one thousand nine hundred and twenty (1,920) senior secondary school students drawn from thirty-two (32) selected schools in Delta Central Senatorial district of Delta State. A stratified random sampling and simple random sampling technique were used to select 1,920 students (960 males and 960 females) of public and private schools. Face and content validity of the instrument used was established. The reliability of the instrument was determined using Cronbach Alpha to obtain the reliability co-efficient of 0.94, 0.75 for questions on network problem, 0.77 for questions on facilities' problem, 0.81 for questions on skills/manpower problem and 0.51 for questions on power problem. The scores obtained from the questionnaire were analyzed using t-test Mean was used to answer research questions. A mean of 2.50 was adopted as a bench-mark for acceptance of items. While, t-values from t-table were used to test the hypotheses at 0.05 alpha level of significance. The findings revealed that senior secondary school students from rural areas, public senior secondary students encountered more of CBT problems. Based on the findings, the researcher recommends that secondary schools (public and private) in the rural areas, public secondary schools (Rural and Urban) should be equipped for computer-based test. Also, that network providers and electricity companies should extend their services to rural areas. Finally, that computer education (theory and practical) should be made compulsory for all students from JSSI to SSS3.

Keywords: ASSESSMENT- value judgment pass on students respond on the problems encountered in computer -based test with respect to a standard parameter or bench- Mark.

INTRODUCTION

Assessment is an integral part of teaching and learning. It is the most appropriate way of determining learning outcomes. It is the process of finding how much learner has acquired learning skills and his personal social development (Idowu & Esere, 2009). Haken (2006), opines that assessment is an integral piece to ensuring that an educational institution achieves its learning goals, as well as a crucial means of providing the essential evidence necessary for seeking and maintaining accreditation. According to Odili (1995), assessment is the act of gathering qualitative and quantitative data about attributes, subjecting such data to statistical analysis and then using the result to examine the various elements in an instructional system with the aim of bringing about improvement in the individual or in the system. Furthermore, for teachers and administrators, assessment is used to perform individual diagnosis and prescription, monitor student's progress, carry out curriculum evaluation and refinement, provide information on mastering, promotion and grading, motivate students and determines grades (Uvah, 2005). Assessment is a systematic approach to collecting, analyzing, and reviewing data to improve learning. It is important because it tells us what and how much students are learning and where they are learning it, and it gives us insight into how we might refine our programmes to help them learn more. The best assessment activities supply us with meaningful information that can be used as the basis for improving educational programmes. It has to be noted, that accrediting agencies such as NUC and Ministry of Education are also interested in assessment because it is one measure of post-secondary institutions ability to achieve their goals. Assessment is important because it helps to achieve the purpose of a course, programmes or academic institution (Ismail, 2012). It helps to understand causal relationship between Action (teaching) and Outcomes (learning) (Wang & Wang, 2013). It

explicitly establishes what is of importance (i.e. Programmes, goals and objectives), and it set standard for student's achievements. It is pertinent to note at this juncture, that assessment cut across all facets of life and that teaching and learning is incomplete without assessment. Based on this, Love and Cooper (2004), highlighted objectives of assessment to include: improvement of students learning, identification of student's strengths and weakness, reviewing, assessing and improving teaching effectiveness, providing curricular programmes, providing useful administrative data that will expedite decision making in order to communicate with stakeholders, improving teaching effectiveness among others.

The most dominant form of assessment in Nigeria, over the years is the manual means of assessment which has its origin from the arrival of missionary in Nigeria. It involves handwritten form of assessment which is done by hand, answers by hands and reported by hands (Oladayo, 2012). It is very cumbersome and requires a lot of human resources most especially when large number of students is involved. It takes a long time to conduct, score as well as to report. Due to the problems inherent in the manual form of assessment as highlighted above, and the need to cope with technological advancement, another form of assessment known as computer-based test (CBT) has emerged as a means of assessing learning outcomes.

Computer-based test is the process in which computer is used in assessing, scoring, and reporting of students' learning outcomes. This implies that teachers and students who are active participants are expected to be exposed to the use of computer and information, communication technology (ICT) facilities like computer system, Uninterrupted Power Supply (UPS), printer, internet which are basic necessities for the computer-based testing. Computer-Based Assessment (CBA) is becoming more popular in Nigeria, as a result of its advantages such as faster administration, processing and delivery of examination results, error free marking of test items, enhanced interactivity and items which are composed of multimedia objects, allowing for the measurement of skills not easily measurable by traditional tests and radical cuts in waste paper as it is generated by paper-and-pencil test (Chapman, 2005, Katerina & Kollias, 2008).

Despite the numerous advantages of computer – based test, still there is reservation about its viability in Nigeria. Foremost amongst the reasons for doubting the viability of computer based test in Nigeria is dearth of infrastructure required for its successful uptake. Much of the infrastructures for computer –based test is either obsolete or overstretched in terms of capacity, accessibility, reliability and security. Still associated with infrastructure for the computer-based test is the absence of internet facilities in rural areas requiring candidates' travel long distance to get internet access; and the challenge of erratic power supply. There is also the issue of resistance to changes by stakeholders that could constitute stumbling block to computer – based test in Nigeria. Perhaps, self-interest and fear of loss of current status are learned conjunctive responsible for stakeholders resistance to computer-based assessment. Dreher, Reiners & Dreher (2011), observed that for teachers and educators, job-roles and control are the major reasons for resisting computer based assessments.

They argue that since computer-based assessment are likely to facilitate a more independent approach to learning for students, teachers who see themselves as experts that transmit knowledge in the classroom are challenged and consequently resist its take off in their classroom practices. For school proprietors and other education service providers, expressed resistance could be as a result of the implicit cost of preparing schools for the uptake of computer-based test. Parents and other stakeholders express apprehension that students' performance in computer-based test and examination is likely to be influenced by individual computer competencies or any other systematic differences than a true expression of knowledge of subject matter being measured by the examination.

Furthermore, the low level of e-education among students may also be a problem of computer-based test. It has been noted that many school leavers in Nigeria are not computer literate. Neither is computer education compulsory in the schools.

In Nigeria, there is a general perception that computer and science oriented courses are meant for male children. This explains why there is a gap between male and female students studying computer and other science oriented courses (Adomi & Kpangban, 2010). According to them, this has prompted government to embrace gender equity programmes in education. Osei (2007), stated that disparity still exists between male and female in the rural and urban. Especially, in the northern areas.

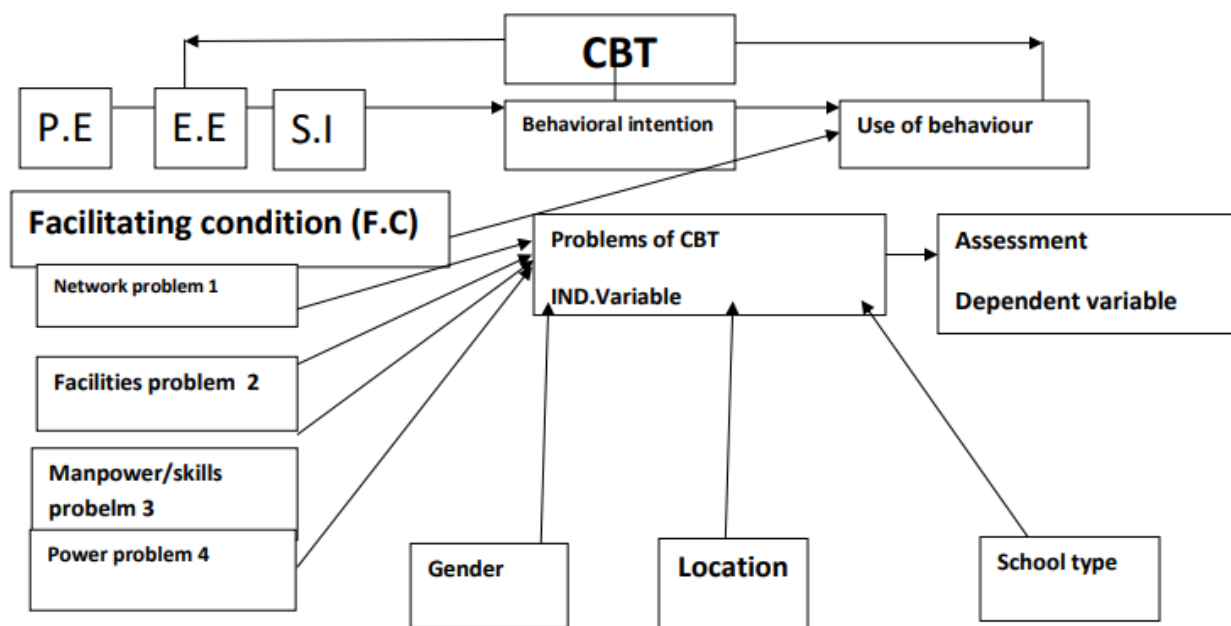
A child's location may play an important role in his/her education, and in particular computer education. According to Aduwa-Ogiegbaen and Iyamu (2005), secondary schools in the rural areas lack access to internet facilities due to inadequate power supply. And that most internet service providers are based in urban areas where people can afford to pay for their services. Despite the introduction of computer education in Nigeria, schools in the rural areas lack qualified computer teachers and this may affect students from rural areas negatively in CBT.

The type of school a child attends, whether public or private, may likely play a significant role in his/her computer education. According to Aduwa-Ogiegbaen & Iyamu (2005), public schools in Nigeria are not given adequate funds to provide furniture, requisite books, laboratories, high tech equipment (computers) and internet connectivity. According to them, teachers and lecturers in these public institutions have to go to commercial cyber cafes before they can have access to computers, while private secondary schools and universities make provisions for their students. For example, the ABTI-American University of Nigeria (AAUN) has 24-hour internet connectivity. According to Osei (2007), most private schools provide laptops for each of their students with the cost been factored into their fee.

Unified Theory of Acceptance and Use of Technology (UTAUT)

Venkatesh, Morris, Davis and Davis (2003) developed UTAUT as a comprehensive synthesis of prior technology acceptance research. The UTAUT has four key constructs. (I.e. performance expectancy, effort expectancy, social influence, and facilitating conditions) that influence behavioral intention to use a technology and/or technology use. The researcher adapts these constructs and definitions from UTAUT to the problems of computer-based testing. Venkatesh et al-(2003), defined **Performance expectancy (P.E)**: as the degree to which individual believes that using the system will help him/her to attain gains in job performance.

UNIFIED THEORY OF ACCEPTANCE AND USE OF TECHNOLOGY MODEL



Source: Venkatesh, V., Morris, M. G., Davis, F.D., and Davis. G.B. (2003)

From the UTAUT model above, before an individual, organization, state or country can adopt a technology for assessment or related activities, four (4) major constructs must be considered. They are performance expectancy, effort expectancy, social influence and facilitating conditions. According to Venkatesh et-al (2003) performance expectancy, effort expectancy, and social influence determine behavioural intention. While facilitating conditions and behavioural intention determine use of behavior.

Effort Expectancy (E.E); the degree of ease associated with the use of the system.

Social Influence (S.I); the degree to which an individual perceives that important others (e.g. family and friends) believe they should use a particular technology.

Facilitating Condition (F.C); the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system.

According to UTAUT, performance expectancy, effort expectancy and social influence are theorized to influence behavioral intention to use a technology, while behavioral intention and facilitating condition determine technology use. Also, individual difference variables, namely age, gender, school type, and class level of student are theorized to moderate various UTAUT relationships.

Behavioral Intention; the degree of fear, when he or she is faced with the possibility of using computers.

This study investigates problems encountered by SSS students' in the use of Computer- Based Test.

Research Questions

The following research questions were asked to guide the study

1. Do male and female senior secondary school students differ in problems encountered in CBT?
2. Is there any significant difference in CBT problems encountered by rural and urban secondary school students?
3. Do public and private senior secondary school students differ in problems encountered in CBT?

Hypotheses

The following null hypotheses were formulated to guide the study

H₀₁: There is no significant difference in the mean of CBT problems between male and female students.

H₀₂: There is no significant difference in the mean of CBT between urban and rural senior secondary school students.

H₀₃: There is no significant difference in the mean of CBT between public and private school students.

This study adopted an *ex-post facto* design. The researcher investigated the problems of computer based test (CBT) in the assessment of senior secondary school students in Delta Central Senatorial District, as related to School type, Gender and Location of students. This type of research design gives no chance for manipulation of variables involved (Okorodudu, 2013). The population of this study comprises of senior secondary school students (public and private) in Delta Central Senatorial District. The estimated population of students is 20,364 (Ministry of Education, Isiokolo, 2013). This includes 12,243 Public schools and 8,121 private school students. Four (4) Secondary schools were sampled from each local government area using a simple stratified random sample. The strata used were school types: Public/private, Location: Urban and Rural, and Gender: male and female. A total of 32 schools were sampled from the eight Local Government Area under consideration. Thereafter, the simple random sampling technique was used to sample sixty (60) SSS1, SSS2 and SSS3 students from each of the thirty two selected schools. This was to ensure that all students have equal opportunity of being selected. Thus, a total of 1,920 senior secondary school students' represented the sample size.

Presentation of Results.

Research question one

Do Male and Female senior secondary school students differs in problems encountered in CBT?

Table 1.1 The mean and standard deviation of CBT problems among male and female SSS students

Gender	Number of students	mean($\bar{x}$)	Standard deviation(SD)	Cutoff point	Judgment
Male	960	2.78	0.89	0.13	Reject
Female	960	2.77	0.89		

From table 1.1 above, the male students with the mean ($\bar{x}$) value of 2.78, SD = 0.89, has a mean difference of 0.01 over their female counterparts that has a mean ($\bar{x}$) of 2.77, and SD = 0.89. Thus, male and female senior secondary school students do not differ in problems encountered in CBT because the mean difference of 0.01 is lesser than the cutoff point of 0.13.

Research Question Two

Is there any significant difference in CBT problems encountered by rural and urban senior secondary school students?

Table 1.2 The mean and standard deviation of CBT problems among rural and urban SSS students

Location	Number of students	mean($\bar{x}$)	Standard deviation(SD)	Cutoff point	Judgement
Urban	960	2.98	0.84	0.13	Accept
Rural	960	2.57	0.89		

From table 1.2 above, the urban senior secondary students with the mean ($\bar{x}$) value of 2.98, SD=0.84 has a mean difference of 0.41 over their rural counterparts that has a mean ($\bar{x}$) of 2.57 and SD = 0.89. thus, urban and rural senior secondary school students differ in problems encountered in CBT because the mean difference of 0.41 is higher than the cutoff point of 0.13.

Research Question Three

Do public and private senior secondary school students differ in problems encountered in CBT?

Table 1.3 The mean and standard deviation of CBT problems among public and private SSS students

School type	Number of students	mean($\bar{x}$)	Standard deviation(SD)	Cutoff point	Judgment
Private	960	2.84	0.95		Reject

Public	960	2.72	0.83	0.13	
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From table 1.3 above, private senior secondary school students with the mean ($\bar{x}$) of 2.84, SD=0.95 has a mean difference of 0.12 over their public school counterparts that has a mean of 2.72 and SD=0.83. Thus, public and private senior secondary school students do not differ in problems encountered in CBT because the mean difference of 0.12 is lesser than the cutoff point of 0.13

Presentation of Results.

The following null-hypotheses were tested at $P \leq 0.05$ alpha level of significance

Hypothesis 1

There is no significant difference in the mean of CBT problems between male and female senior secondary school students.

Table 4.8: The t-test of CBT problems among male and female SSS students.

Gender	N	Mean difference	SD	df	t-cal	t-crit	p-value	Judgement
Male	960	2.78	0.89	1,918	0.25	1.96	0.05	Accept
Female	960	2.77	0.88					

As shown in table 4.8 above, the calculated t-value of 0.25 was found not to be significant at $df = 1,918$ $p \leq 0.05$ level. Therefore, the null hypothesis which states that there is no significant difference in the mean of CBT problems between male and female senior secondary school students was retained. The conclusion was drawn that both male and female senior secondary school students in Delta Central experience similar CBT problems.

Furthermore, as shown in table 4.8 above, the male students with a mean value of 2.78, SD=0.89, has a mean difference of 0.01 over their female counterparts that has a mean of 2.77, SD=0.89. The mean difference of 0.01 was not found significant at $p \leq 0.05$ significance level. The conclusion was drawn that the effect size of 0.01 which was in the favour of the male students did not indicate that they encountered less of CBT problems than their female counterparts involved in this study.

Hypothesis 2

HO₂: there is no significant difference in the mean of CBT problems between urban and rural senior secondary school students.

Table 4.9: A The t-test of CBT problems among urban and rural SSS students.

Location	N	Mean	SD	df	t-cal	t-crit	P	Judgement
Urban	960	2.98	0.84	1,918	3.2	1.96	0.05	Reject
Rural	960	2.57	0.89					

As shown in Table 4.9 above, the calculated t-value of 3.2 was found significant at $df = 1,918$, $p \leq 0.05$ level. Therefore, the null-hypotheses which states that there is no significant difference in the mean of CBT problems between urban and rural senior secondary school students was rejected. The conclusion was drawn that urban and rural senior secondary school students encountered CBT problems differently in Delta Central Senatorial District of Delta State.

Furthermore as shown in Table 4.9 above, the urban students with the mean of 2.98, $SD = 0.84$ has a mean difference of 0.41 over their rural counterparts that has a mean of 2.57, $SD = 0.89$. The mean difference of 0.41, was found to be significant at $p \leq 0.05$ level of significance. The conclusion was drawn that the effect size of 0.41 which was in favour of urban senior secondary school students indicates that they encountered less of CBT problems than their rural counterparts involved in this study.

Hypothesis 3

H_{O3} : there is no significant difference in the mean of CBT problems between public and private school students.

Table 4.10 The t-test of CBT problems public and private SSS students.

School type	N	Mean	SD	df	t-cal	t-crit	P	Judgement
Public	960	2.72	0.83	1,918	2.94	1.96	0.05	Reject
Private	960	2.84	0.95					

As shown in table 4.10 above, the calculated t-value of 2.94 was found to be significant at $df = 1,918$, $p \leq 0.05$ level. Therefore, the null-hypothesis which states that there is no significant difference in the mean of CBT problems between public and private senior secondary school students was rejected.

The conclusion was drawn that public and private school students encountered CBT problems differently in Delta senatorial districts of Delta state.

Furthermore, as shown in table 4.10 above, the private school students with the mean value of 2.84, $SD = 0.95$ has a mean difference of 0.12 over their public school counterparts with the mean of 2.72, $SD = 0.83$. The mean difference of 0.12 was found to be significant at $p \leq 0.05$ level. The conclusion was drawn that the effect size of 0.12 which was in favour of private school students indicates that they encountered less of CBT problems than their public school counterparts involved in this study.

Discussion of findings

This study was carried out on the assessment of senior secondary school students' problems in the use of CBT in Delta Central Senatorial District of Delta State.

It was also revealed in table 1, that rural senior secondary school students in Delta Central encountered more of CBT problems than their urban counterparts. This finding supports Aduwa – Ogiegbaen and Iyamu (2005) that schools in the rural areas lack access to internet facilities due to inadequate power supply. And that most internet service providers are based in the urban areas where people can afford to pay for their services. Result from table 2, revealed that public senior secondary school students in Delta Central encountered more of CBT problems than their private school counterparts. This finding supports Osei (2007) that most private school in Nigeria have computers and internet connectivity. While such is lacking in the public schools.

Summary

This study is aimed at the assessment of senior secondary school students' problems in the use of CBT in Delta Central Senatorial Districts of Delta State. The CBT problems investigated includes network problem, facilities problem, skills/manpower problem, and power problem as related to students' sex, location and school type. In carrying out the study, seven research questions were raised and answered, from these research questions, six null-hypothesis were tested at 0.05 alpha level of significance. The researcher made use of one thousand nine hundred and twenty (1,920) SSS students (960 males and 960 females) in Delta Central Senatorial Districts of Delta State. A valid and reliable questionnaire was administered through stratified random and simple random sample techniques respectively. The reliability of the entire instrument and the subsections were established using Cronbach alpha. The scores of the sampled students in the questionnaire was used in data analysis. T-test for testing difference between two independent variables was used to analyze the data. Mean was also used to answer the research questions while t-values from t-tables was used in testing the hypothesis at 0.05 alpha level of significance.

The results obtained from the study showed that;

1. The null hypothesis of no significant difference between male and female students in CBT problems was obtained
2. The null hypothesis of no significant difference between urban and rural students in CBT problems was rejected.
3. The null hypothesis of no significant difference between public and private school students in CBT problems was rejected

Conclusion

The following conclusions were made based on the findings of the study.

1. The analysis of CBT problems of urban and rural students in the study revealed that rural SSS students encountered more of CBT problems than their urban counterparts.
2. The analysis of CBT problems of public and private school students revealed that public school students encountered more of CBT problems than their counterparts in private schools.
3. The analysis of CBT problems of public and private school students revealed that public school students encountered more of CBT problems than their counterparts in private schools.

Recommendations

In view of the above summary of research findings and conclusions the researcher hereby recommends:

1. Government should equip public schools with computers and other peripheral devices for effective CBT like their private school counterparts.
2. Network providers and electricity companies should extend their services to the rural areas. Also, competent computer teachers should be transferred to schools in the rural areas for effective computer education.

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