

AN INVESTIGATION OF SENIOR SECONDARY SCHOOLS STUDENTS ATTITUDE TOWARDS PAPER PENCIL AND COMPUTER BASED TEST IN NIGER STATE, NIGERIA BY

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ABSTRACT

The study centered on investigating senior secondary school students attitude towards paper pencil and computer based test in Niger State, Nigeria. Two research questions and hypotheses were formulated to guide the study. The design adopted for the study was descriptive survey design. A descriptive survey is a design in which a large number of respondents opinion are sampled on a particular issue. The target population of this study consists all the senior secondary school students in Niger State who are eligible to partake in the 2018 JAMB screening exercise which stood at 29,578. Stratified and Simple random samplings were adopted to draw 876 students from Zone A, B and C of Niger State, Nigeria. The instrument for data collection was a structured questionnaire tagged "Student attitude to CBT and PPT Questionnaire (SACPQ)" which was designed by the researchers' to elicit information on the students' attitude towards CBT and PTT examination. The instrument was given to three experts in Test and Measurement for scrutiny after which the reliability of the instrument was obtained with Cronbach alpha reliability which ranged from 0.79 to 0.96. Descriptive and inferential statistics were adopted for analyzing the data with mean and standard deviation while the stated null hypotheses were tested with independent t-test and One-way ANOVA. Findings revealed that the Attitude of students towards CBT and PPT is significant negative. This implies that most students feel that jamb should be abolished due to their negative perception and stressful nature of the examination. It was also found that gender does not have any significant influence on students' attitude towards PPT and CBT examination in the study area.

Keywords: Investigation, Students Attitude Paper Pencil, Computer Based Test

BACKGROUND TO THE STUDY

Education is a veritable tool for human empowerment and national development in the society. For effective achievement of the aims, goals and objectives of education there is need for dependent on qualitative execution of quality examination. This is because education is a significant tool that determines the extent to which a learner has achieved academically. To achieve academically there is need for a qualitative form of examination. Ali (2006) defined examination as an assessment used to measure a test-takers knowledge, skills, aptitude, physical fitness or classification. Examination plays a vital role in determining what

goes on in the classroom in terms of what and how the teacher teaches and the students learn, and how it can impact on both teaching and learning.

Examination techniques used in evaluation and assessment progress and placement purposes are of different kinds, they include paper-pencil examinations, assignments, presentations, etc. they are techniques used in educational setting for educational purposes. With the rapid advancement of information and communication technology (ICT) in teaching and learning Usal and Kuzu (2009) has stipulated the paradigm shift from paper-pencil based system of examination which is general term is Computer Assisted Testing, Computerized Assessment or Computer Based Testing (CBT).

JAMB is an examination body saddled with the responsibility to conduct entry into tertiary institutions in Nigeria through the Unified Tertiary Matriculation Board (UMTE). During the past few decades, examinations in Nigeria are conducted in a paper-pencil form. (PPT) Paper-Pencil Test is an assessment procedure in which students are presented with questionnaires or inventories which ask or give simple statements requesting them (students) to provide responses. The rapid growth and enrollment of students in schools led to the advancement in the use of information and Communication Technology in teaching and learning process, coupled with population of intending undergraduate students, high rate of examination malpractice among others in Nigeria, Computer Based Testing (CBT) has been an alternative means of assessment to paper-pencil based system which JAMB has stipulated to be a compulsory mode of UTME assessment with effect from 2015.

Jimoh, Abduljaleel and Kawu (2007) defined CBT as tests or assessment that are administered by computer in either stand-alone or dedicated network or by other technological device linked to the internet or Worldwide Web, using multiple choice questions (MCQS). They observed further that since 1960's; this form of test has been in use to test knowledge and problem solving skills. With the integration of ICT in the process of learning, educationists demand a more effective, interactive and unified assessment system. Research exploring the role of ICT in teaching and learning and assessment process conclude that online learning and alone assessment are imparting pedagogical development in high education (Hricko, & Kowell, 2005). CBT's are forms of assessment in which the computer is an integral part of question papers delivery, response, storage, marking, and reporting responses from a test or exercise (Whittington, Bull & Danson, 2001).

This form of assessment has minimized the involvement of students in unethical behavior in examination; reduce the burden of invigilators and supervisors. With the current

trend in the world, computer or ICT provide a great tool in meeting the demand of the society. Bodman and Robinson (2004) explained that CBT offers several advantages over the traditional paper-pencil based tests. It provides opportunities to measure complex form of knowledge and reasoning that is not possible to engage and assess through traditional method. It is also possible to score and interpret multiple aspects of student's performance on a wide range of tests. Summarily, the advantages of CBT over the paper-pencil based test have been explained in several researches conducted. According to Peter, Bull and David (2004) CBT is not just an alternative method of delivering examination, it represents an important qualitative shift away from traditional method such as paper-pencil system. These advantages notwithstanding, does not imply that CBT's are inartistically better than paper-pencil test system.

Despite the relative newness of CBT in Nigeria the study intends to investigate the awareness level and perception of the students towards CBT and PPT. This research also intends to find out and analyze the perception of students based on the type of school attended and geographical location of the students.

Students' awareness to testing is very important on the basis of assessing their performance. This method has been faced with several problems in Nigeria testing system (Isa, Alabi & Oyekunle, 2010). Though these limitations exist; it is also pertinent to assess the awareness of students who are the test takers. Several researchers have assessed these with diverse views Ricketts and Wilkis (2001) suggested that the introduction of computer assisted assessment without consideration of the interface design could lead to a drop in performance. It was revealed that only 55% of students preferred computer based assessment in Geography, 72% preferred computer based assessment in Biology and 90% preferred computer based assessment in Business. These findings showed that the acceptability of computer based test can be said to be dependent on the course type. Bertolo and Lambert (2007) carried out a study in Chemistry and found that computer based assessment had a positive effect on student learning experience.

Researchers have had different findings as relates to the international guidelines of computer testing. Chua (2012) found that there was no testing effect on test performance in computer testing method. It was also discovered that the computer based testing method increased motivation. This finding is also corroborated by Doolan and Banker (2005) in an evaluation of computing students' performance using the computer based testing method, it

was discovered that students had a positive awareness towards the system. Calarina and Wallace (2002) also found that the CBT group out-performed the PPT group. However, Ricketts and Wilks (2001) findings negated these findings. It was discovered that students had poor performance using the online assessment method in a numeracy and statistics testing method.

There are numerous variables that impact on students performance when questions are presented on a computer, such as the quality of the monitor (Schenkman, Fukuda, & Persson, 1999) and others. Attitude is one of the most prominent variables that have not been so much considered in various related studies particularly from the African context and Nigeria particularly. Attitude by definition is an inner psychic state influencing behaviour. We can understand an inner state from actions and words. For instance, we may presume that a person actively avoiding a computer has a negative attitude towards it. Attitude is not an inborn, instinct phenomenon; it mainly depends upon person's experience and its impact in a new situation (Saparniene, Merkys, & Saparnis, 2002).

Consequently, attitudes are formed in the process of experience and their change is possible due to the internal and external factors. In other words, attitude towards computer based test in this study is defined as ways of thinking and feelings of the students towards taking computer-based test. Previous Studies In early studies, the main research focus was on whether computer-based tests were equivalent to paper-and-pencil tests when computers gave exactly the same tests as those given in paper-and-pencil formats. In order to define score equivalence, the American Psychological Association (APA) in 1986 published the Guidelines for Computer-Based Tests and Interpretations. The guidelines define the score equivalent of computerised tests and conventional paper-and-pencil test in two ways. First, as the rank order of scores of individuals tested in alternative modes closely appropriating each other. Secondly, as the means, dispersions and shapes of the score distributions being approximately the same by re-scaling the scores from the computer tests versions (APA, 1986). The guidelines also require that any effects due to computer administration be either eliminated or accounted for in interpreting scores. In their empirical study, Olsen (1986) compared paper-administered, computer-administered, and computer-adaptive tests by giving third- and sixth-grade students Mathematics applications achievement tests.

This study found no significant differences between paper-administered and computer administered tests, and equivalences among the three test administrations in terms of score rank order, means, dispersions, and distribution shapes. Mazzeo and Harvey (1988)

(Envisage International Cooperation, 2010) pointed out that computer-based test may affect test scores and consequently their equivalence with paper-and-pencil versions, and that test with reading passages may be more difficult when given on computers. Summarising all the mentioned studies, Bugbee (1996) concluded that the use of computers really affects testing; however, computer-based and paper-and-pencil tests can be equivalent provided the test developers take responsibility by showing how the equivalent can come by. Bugbee (1996) stated that the barriers to the use of computer-based testing are inadequate test preparation and failure to grasp the unique requirements for implementing and maintaining computer tests. In other words, Bugbee reminded us that some factors such as the design, development, administration and user characteristics must be taken into consideration when computers are used.

Afrifa, Hassan Yuguda and Ishaya (2016) conducted a study on the relative effectiveness of Paper Pencil Test (PPT) which was used to administer UTME to students who choose to apply to Nigerian public and private monotechnics, 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 since 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.

Oduntan, Ojuawo and Oduntan (2016) carried a study on Assessment is a means by which the knowledge of students on lessons taught are measured. Computer Based Test

(CBT) is assessments that are administered by computer in either stand-alone or dedicated network or by other technology devices linked to the internet or World Wide Web (WWW) most of them using multiple choice questions. The Paper Pencil Test (PPT) is the conventional method of writing exams. This paper focuses on the comparative analysis of student performance in CBT and PPT. A correlational analysis of CBT and PPT assessment method was used. This involves the use of questionnaire to collect data on the scores of students who wrote both CBT and PPT UTME exams in 2013 and 2014. Pearson Correlation was used for the analysis. Result showed a positive correlation in the scores of student, it is therefore concluded that, if students are well prepared for the CBT exams, their performance will be enhanced. It is recommended that government improve the technological awareness and utilization of computer based test at the primary and secondary school level for both the teachers and the students.

Mostafa (2016) study aims at examining the score comparability of institutional multiple-choice reading comprehension tests in two testing methods, i.e. paper-based and computer-based tests taken by Iranian first-year English students in Azad University of Tehran, Iran. In order to find the results, the researcher required examining the impact of computer-based testing (henceforth CBT) on the test score results, and exploring the relationship between particular test takers' characteristics such as prior computer familiarity and computer attitudes as well as test performance with their test scores. Two equivalent tests were administered to participants on two different occasions. Utilizing matched t-test to compare the means of two test modes, the results of the study show the priority of PPT over CBT with .01 degree of difference at $p < .05$. Using ANOVA, the findings revealed that computer familiarity and attitude towards computer had no significant influence on the students' performance in computerized test. Additionally, participants showed more preference on test features presented on the computer test.

Hosseini, Mohamad, Kamarzarrin and Mohamad (2014) study to examine the score comparability of institutional English reading tests in two testing methods, i.e. paper-based and computer-based tests taken by Iranian EFL learners in four language institutes and their branches in Iran. In the present study, the researcher tried to examine whether there is any difference between computer-based test results (henceforth CBT) and paper-based test (PPT) results of a reading comprehension test as well as exploring the relationship between students' prior computer experience and their test performance in CBT. Two equivalent tests were administered to one group of EFL learners in two different occasions, one in paper-based

format and the other in computer-based test. Utilizing t-test, the means of two modes have been compared and the results showed the priority of PPT over CBT with .01 degree of difference at $p < 0.05$. Using ANOVA, the findings revealed that computer experience had no significant influence on the students' performance in computerized test.

Garas and Mostafa (2018) study examined whether gender has any significant influence on PPT and CBT. The study utilised two research questions and hypotheses. The design was a descriptive survey design with a researcher's developed instrument tagged attitude and gender checklist. The study, therefore, ascertains whether the mode of student testing (computer-based or paper-based) differs based on gender. The sample consists of 78 students undertaking financial accounting courses at Zayed University during the summer semester. A simple difference in means statistics test shows that there is no statistical significant difference between the students' paper-based and computer-based scores on the basis of gender. Also, benchmark regression analysis showed that males have similar preference to females on PPT and CBT. The paper provides evidence from the Gulf region as to how technology-based assessment is affected by the gender.

Also, Adeyinka and Bashorun, (2012) study examined the attitude of the students towards computer-based test CBT and PPT at the University of Ilorin, Nigeria. A case study research design was adopted to carry out the study. The sample consists of 2209 undergraduate students based on gender selected from seven out of the ten Faculties that make up the population of students in the area. Data were collected through a computer-based test attitudinal survey CBTAS and a focus group discussion. The results demonstrated that; generally, respondents have positive attitude towards CBT. 50% of male and 50% of female students in the study area prefer PPT to CBT. Respondents also demonstrate strong perception of increase in their learning performance as a result of taking CBT. On the other hand, problems such as shortage of computers, lack of skills, loss of data in the process of writing CBT, slow network and hazard of reading on the screen were identified.

STATEMENT OF THE PROBLEM

The problem of choice among students between Paper-Pen Test (PPT) and Computer Based Test (CBT) has been a major issue to most test takers in Nigeria. This is due to the attitude portrayed by most students taking the examination. As most students complained of over familiarity with the paper pen test as they feel it is easier than the paper-pen-test. Others feel that the lack of computer literacy skills coupled with inaccessibility to computer systems

in the rural areas has led to the dislike of the Computer Based Testing (CBT) examinations. However, it is not yet clear, to what extent these changes will be fruitful to teachers, and students in the academia without high level of awareness or experience on the use of computer or CBT most especially Nigeria. The management of Joint Admission and Matriculation Board (JAMB) as a body saddled with the responsibility to conduct entrance examination into tertiary institutions in Nigeria through Unified Tertiary Matriculation Examination (UTME) has in recent times been criticized by test takers due to the harsh nature of most teachers (invigilators) during the conduct of the examination. Personal interaction revealed that most invigilators find it difficult to direct the students when in difficulty with the computers. Also, power interruption has been a common issue raised by most students as they are denied to continue their examination when disrupted by power failure. This has resulted to negative attitude of students towards CBT examination. Hence, most of them prefer to stick to the Paper-pencil Test (PPT). The government on its part has considered the relative importance in lowered administrative cost, time, saving, less demand on teachers/ invigilators, reduction on the incidence of examination malpractice among others as the major reason for the introduction of CBT over PPT. however, these effort has not yielded the desired results. Therefore, the problem of the study put in a question form is: What is the attitude of senior secondary school students towards paper pencil test and computer based test in Niger State, Nigeria?

RESEARCH QUESTIONS

The following research questions were formulated to guide the study

1. What is the attitude of students towards CBT and PPT test?
2. To what extent does gender influence students response on CBT and PPT?

RESEARCH HYPOTHESES

The following null hypotheses were formulated to guide the study which were tested at 0.05 alpha level of significance

1. Attitude of students towards CBT and PPT is not significant positive
2. Male students do not differ significantly from female students in terms of their CBT and PPT.

RESEARCH METHODOLOGY

The design adopted for the study was descriptive survey design. A descriptive survey is a design in which variables are manipulated and the researcher has no control over the research variables. The design was therefore be preferable as the study is only interested in describing and interpreting certain variables in relation to the population through the use of questionnaire in order to ascertain the opinion and perception of participants on a particular concept.

The target population of this study consisted all the senior secondary school students in Niger State who are eligible to partake in the 2018 JAMB screening exercise which stood at 29, 578. The instrument for data collection was a structured questionnaire tagged “Student attitude to CBT and PPT Questionnaire (SACPQ)” which was designed by the researchers to elicit information on the students’ attitude towards CBT and PTT examination. The *SACPQ* consists two namely sections A&B respectively. Section A seek to elicit information on the demography aspect of the respondents such as sex, type of school, location of school and Local Government Area, while section B elicited information on students’ attitude towards CBT and PPT. The survey questionnaire was given to three experts in Test and Measurement for scrutiny. Based on the suggestions, comments and observations of these experts, some of the items in the instrument were removed and substituted while others were modified. The results obtained were subjected to a Cronbach alpha and the overall reliability of the questionnaire ranged from 0.79 to 0.96 accordingly. Descriptive and inferential statistics were adopted for analyzing the data for the study, descriptive and inferential statistical analyses were used.

PRESENTATION OF RESULTS

The results of the data collected are presented hypothesis-by-hypothesis as shown below.

Hypothesis one: Attitude of students towards CBT and PPT is not significantly negative

Table 1: One-Sample t-test Statistics with attitude of students towards CBT

Variable	N	Mean	Std. Deviation	Std. Error Mean	p-value
Attitude of students towards CBT	748	37.5842	9.15300	.33467	.000

*p<.05

Table 2: One-Sample t-test Statistics with attitude of students towards PPT

Variable	N	Mean	Std. Deviation	Std. Error Mean	p-value
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Attitude of students towards PPT	748	32.0021	7.2201	.37100	.062
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p>.05

Table 1 of the result with the hypotheses that states attitude of students towards CBT is not significantly negative revealed that the p-value of .000 was less than the chosen alpha of .05 thus the null hypothesis is rejected. This implies that most students in the study area showed negative attitude towards CBT. On the other hand, the result of the hypotheses that states attitude of students towards PPT is not significantly negative revealed that the p-value of .062 was greater than the chosen alpha of .05 thus the null hypothesis is accepted. This results implies that student prefer the traditional PPT than the CBT in the study area.

Hypothesis two: Male students do not differ significantly from female students in terms of their attitude towards PPT and CBT. The independent variable in this hypothesis is gender categorized as male and female, while the dependent variable is attitude towards PPT and CBT.

Table 2: Gender and students' attitude towards PPT

Variable	N	Mean	SD	p-value
Male	401	38.42	9.73	.084
Female	347	39.29	9.72	

p <.05

Table 3: Gender and students' attitude towards CBT

Variable	N	Mean	SD	p-value
Male	401	31.17	7.52	.078
Female	347	35.07	8.43	

It is evident from Table 2 that the null hypothesis of the influence of male students do no differ significantly from female students on their attitude towards CBT and PPT shows

that the p-value of .224 was greater than the chosen alpha of .05 thus the null hypothesis is not rejected.

DISCUSSIONS OF RESULTS

The result of hypothesis one revealed that the attitude towards PPT and CBT was significantly negative. This is because most student prefer PPT to CBT. This is attributed to the fact that most student do not prefer CBT due to some inherent weakness of the test and it inability to meet with students demands. The present finding is agreement with Afrifa, Hassan Yuguda and Ishaya (2016) results which revealed that there are no adequate facilities to teach and learn computer science in schools in the selected LGAs. 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. Also, Mostafa (2016) findings revealed that computer familiarity and attitude towards computer had a significant influence on the students' performance in computerized test. Additionally, participants showed less preference on test features presented on the computer test.

There was no significant influence of gender on PPT and CBT in the study area. The result indicates that test takers do not differ irrespective of their sex stereotype. The result agrees with Garas and Mostafa (2018) mean statistical test shows that there was no statistical significant difference between the students' paper-based and computerbased scores on the basis of gender. Also, benchmark regression analysis showed that males have similar preference to females on PPT and CBT. The paper provides evidence from the Gulf region as of how technology-based assessment is affected by the gender.

Also, Adeyinka and Bashorun, (2012) results demonstrated that; generally, respondents have positive attitude towards CBT. 50% of male and 50% of female students in the study area prefer PPT to CBT. Respondents also demonstrate strong perception of increase in their learning performance as a result of taking CBT.

Implications of the Finding on Education

Clearly the results of this study have implications for learning and education generally, as well as for further research. Given the positive attitudes towards CBT and PPT demonstrated by the respondents in this study, it implies that respondents in the study are suited for a full range of technology courses. This is assumed will fast-track the process of transforming delivery of courses at the university to complete online. The positive attitude of

student towards the PPT and CBT examinations and availability of adequate facilities are major areas that the government should focus on. The most important implication resulting from this study involves recognizing the magnitude of the perceived impact of CBT and PPT and its effect on attitude of test takers. It is believed that early identification of learners who are not skilful in taking CBT and PPT test is hoped to give instructor, teaching assistants, and/ or cooperative learning teams an opportunity to provide additional assistance for students who find taking CBT an academic challenge.

CONCLUSION

This study has examined the attitude of the students towards computer-based test CBT and PPT. And so far, the results have demonstrated that; generally, respondents have positive attitude towards PPT and CBT. More than the average respondents prefer PPT to CBT. The results also demonstrate strong attitude that CBT reduced students' grades. On the other hand, problems such as shortage of computers, lack of skills, loss of data in the process of writing CBT, slow network and hazard of reading on the screen were identified as issues surrounding the conduct of CBT by the respondents. From personal development and utilization experiences of PPT and CBT in selected school in Nigeria, the study concludes that computer-based testing (CBT) has now taken over the assessment process and it is becoming a major testing alternative. It is expected that further research study be conducted on computer based testing in terms of facilities such as computers, power supply, mode of administration and credibility of results obtained by test takers.

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