ASSESSMENT OF STUDENTS ATTITUDE AND CHALLENGES OF COMPUTER BASED TESTING AMONG STUDENTS OF JIGAWA STATE COLLEGE OF EDUCATION GUMEL

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DECLARATION

I Usman Abdulkadir, hereby declare that, this dissertation is the record of my independent investigation, except where I have indicated my indebtedness to other sources. I, hereby certify that to the best of my knowledge, this dissertation has not already been presented to any institution for the award of any degree.

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CERTIFICATION

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This dissertation entitled: "Assessment of Students Attitude and Challenges of Computer Based test among students of Jigawa state college of education Gumel" written by Usman Abdulkadir meet the regulation and requirement governing the award of M Ed. Tests and Measurement in the Department of Education Faculty of Education Bayero University, Kano and it is approved for it contribution to knowledge and literary presentation.

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ABSTRACT

The study investigated the Assessment of Students Attitude and Challenges of Computer Based test among students of Jigawa state college of education Gumel. The study has four objectives, two research questions were asked and two hypotheses were tested at 0.05 level of significant. Descriptive survey research design was adopted for the study. A population of four thousand five hundred and sixty seven (4,567) which comprised three thousand two hundred and fifty five (3,255) was male and one thousand three hundred and twelve (1,312) were female. Two hundred and fifty four (254) subjects were sampled for the study using cluster sampling technique. Data for the study were collected using Adopted Questionnaire. Titled "Assessment of student's attitude and challenges of computer based testing, with a reliability index of 0.7.The instrument was administered on students of Jigawa state college of education Gumel and data were obtained. The statistical techniques used for data analysis were simple percentage, t-test and ANOVA using SPSS. The results of the study revealed that, 80.7% of the students have positive attitude toward computer based test. The study also revealed that, the major challenges faced by students during the conduct of CBT were poor internet service; inadequate power supply, etc. The first hypothesis was revealed that there is no significant gender difference in the attitude of students of Jigawa State college of Education Gumel towards computer based testing CBT. The second hypothesis was also revealed that there is significant difference in the attitude of students towards CBT between Arts and social sciences, sciences and ECCE/PED among students of jigawa state college of education Gumel. It was recommended that to achieve effective conduct of computer based test, the issues of poor internet services and poor power supply should be adequately address by both public and private sectors, and the student positive attitude toward CBT should be promoted. This should be done through ensuring implementation of the relevant policy on education as it affect ICT in schools, therefore this would help the students to be familiar and acquainted with computer.

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OPERATIONAL DEFINITION OF TERMS

Assessments: The systematic procedure for determining the student's attitude and challenges towards the conducts of Computer Based Testing.

Attitude: The ways of thinking and feelings of the students towards taking Computer Based Test (CBT).

Challenges: Difficulties encountered by the students during the conduct of Computer Based Testing.

Computer Based Test (CBT): The assessment content is presented digitally using a form of technology such as computer.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Educational institutions are saddled with the responsibilities of teaching and learning, beside the moral upbringing of the learners. To ascertain that the learners have learned and therefore teaching has taken place, assessment is inevitable. Educational assessment serves several purposes including feedback to teachers, learners and even parents.

The centrality of educational assessment in ensuring effective teaching and learning cannot be over emphasized. The quality of assessment is a reflection of the quality of teaching and learning of the system. Quality assessment ensures that standard is sustained and that the certification from such assessment is not fulfill righteousness but that the certificate is worth the knowledge content of the holders. Where the contrary is the case, then public confidence on certificates from such system begins to wane. This is the case in Nigeria, where the public is losing confidence on the certificate of her educational system, showing that something is wrong with the assessment model. The public outcry on the falling standard of education is contingent on this premise (Nnadi and Badah, 1996).

In Nigeria, the traditional assessment model has been largely the paper and pencil test (PPT) or paper based test (PBT). The PPT has been largely characterized by different form of examination malpractices such as bringing in unauthorized material, writing on currency notes and identify card, spying of other candidates in examination hall, swapping of answer sheets and change of examination scores or grades. Others include, impersonation, leakage of questions to students before the examination, convenience with supervisors and school

authorities to cheat, body writing to tattoo in which student especially female write on hidden parts of their bodies (Ogunlade et. al,(2001); Abubakar & Adebayo, 2014).

Thus leading to poor quality assessment in the system the implication is the reduction in public confidence on the outcome of the assessment. To this end, a paradigum shift in the frontiers of educational assessment was needed to redeem the future of education in Nigeria. The computer based test (CBT) offers itself as a one alternative in the 21st century but not without implications, especially in the Nigeria case

But as a result of the development of information technology (ICT) has significantly transformed the method of assessment. In many academic domains, educational measurement has been moving from paper pencil test (PPT) to the use of computer based testing (CBT). CBT is defined as a tests or 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) (Sarana– Daniela and lorentz 2007).

Computer based tests have been used since 1960s to test knowledge and problem solving skills (Peter,Bill and Devid 2004). Computer based assessment system have enabled educators and trainers to schedule, deliver and report on survey, quizzes, tests and exam. There are two main types of computer based testing. The most familiar type is where candidates fill in their responses on a paper form, which is fed in to computer optical mark reader (OMR). This reads the form, scores the paper and may even report on the test reliability. The second type of computer based testing is where computer provide an assessment interface for student they input their answers and receive feedback in a computer. (Peter, Bill and Devid 2004).

In general, several areas appear worthy of investigation, including issues related to quality factors that may influence performance and students attitude towards computer based tests (CBT).

1.2 Statement of the Problem

Some institutions and professional examination bodies across the globe are migrating toward the use of computer based test (CBT) to test the student knowledge. The advantage of using computer technology for educational evaluation or assessment in a global sense have been recognized and these include lower administrative cost, time saving and less demand upon teachers, minimize examination malpractice among others (Johnson, 2004).

Individual's attitude is an important variable in the learning process, Gettuker and Hluaka (1992) observed that, research assessing the attitude of undergraduate to a computer based test is lacking, despite the fact that, there are many challenges faced by the students during the CBT administration such as server and problem of power supply, Lack of computer skills by the students, Lack of conducive CBT centre and computer in the CBT centre were faulty among others, which lead to the massive failure in UTME CBT.

This can be supported by the statistical analysis of UTME CBT results between 2015-2017. The results shows that, there are massive failure of students whose did not gets the minimum points to enter into the universities and other tertiary institutions as a cut off marks. The analysis shows that, in the year 2015, 1.4 million candidates sat for UTME CBT but only 392,427 candidates got a minimum point which represented by 28% of the whole candidates for that year, also in the year 2016, 1.5 million candidates also sat for UTME CBT, only 472,321 represented by 31.49% of the total candidates got the minimum cut off point, similarly in the

year 2017, 1.7 million candidates also sat but, only 567,395 candidates have the minimum cut off point, which represented by 33.49% of the total candidates in the year. Similarly such challenges was seriously causes this failure which mostly affected by students of college of education, because majority of the students whose admitted in to college of education are those with lower scores between (80 – 100) in their UTME CBT.

In view of this, the study therefore, set out to investigate on the assessment of student's attitude and challenges of computer based test among students of Jigawa state college of education Gumel.

1.3 Objectives of the Study

The objectives of this study were to determine:

i. The attitude of students of Jigawa state college of Education Gumel towards Computer Based Testing (CBT).
ii. The CBT challenges faced by students of Jigawa State college of Education Gumel.
iii. If differences exist in the attitude of students of Jigawa state college of education Gumel towards CBT with regard to gender.
iv. The differences in attitude of students towards CBT among Arts and Social Sciences, Sciences and ECCE/PED of Jigawa State College of Education Gumel.

1.4 Research Questions

This study answered the following questions:

i. What is the attitude of students of Jigawa state College of Education Gumel towards computer based testing (CBT)?

ii. What are the CBT challenges faced by students of Jigawa state college of Education Gumel?

1.5 Hypotheses

The following null hypotheses were tested at 0.05 level significant

i. There is no significant gender difference in the attitude of students of Jigawa State college of Education Gumel towards computer based testing CBT.

ii. There is no significant difference in the attitude of students' towards CBT among Arts and Social Sciences, Sciences and ECCE/ PED of Jigawa State College of Education Gumel.

1.6 Significance of the Study

This study added to the current research that focused on assessment of student's attitude and challenges of computer based test (CBT) among students of Jigawa state college of education Gumel. The outcome of this study would be of use to JAMB administrators, in order to help them to find out what has been the students constraint in the use of computer based testing (CBT). While the study is also significance to the students by assisting them to acquire ICT skills before taking computer based test, also is significant to Universities Management in such a way that, they can consider the lower scores of students which resulted by challenges encountered during the conduct of CBT through reducing their cut off marks for entering in to the university. However this study is significant to the lecturers of colleges of education and any other NCE awarding institution, researchers as well as the test experts. Extensively, this study may create awareness to even Jigawa State Examination Resources Department (JERD) to know the students attitude and challenges on CBT. Also to help the JERD to formulate policy

that would make e – assessment a way of assessing students. Furthermore, the finding of this research could eventually be a source of reference for all stakeholders in the area of educational process as products for planning, befitting educational programs for our state and nation at large in the nearest future.

The study may also provide the test–experts with many recommendations that help them to come with different ways of improving this new method of assessment, and the researchers in all areas of study with the opportunity to access empirical evidence in their quest for further studies on assessment of student's attitude and challenges of computer based tests. Finally the study will add to the present body of knowledge.

1.7 Scope and Delimitations of the Study

The scope of this study focused on students of Jigawa State College of Education Gumel who sat for UTME computer based testing (CBT), 2016/2017 session from six academic Department i.e ECCE, PED, Biology, Mathematics, Economics and Social Studies Department within three schools i.e ECCE/PED, Sciences and Arts and Social Sciences to assess their attitude and challenges on computer based testing CBT and not any other variables related to CBT. Therefore, the study was delimited to other tertiary institutions in Jigawa state, which include, Bilyaminu Usman Polytechnic Hadejia, Hussaini Adamu Federal Polytechnic Kazaure, Jigawa state Polytechnic Dutse, Jigawa state college of Islamic and legal studies Ringim, Federal University Dutse and Sule Lamido University Kafin Hausa. Furthermore even within the study areas, the study was delimited to other department such as: Arabic, English, Hausa, Business education, Agric Double Major, Home Economics, Fine & Applied Arts, Special need education and Adult and non-formal Education

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Introduction

This chapter contains an extensive review of up to date related materials to this study, that examined the attitude of students and challenges of computer based testing (CBT) among students of Jigawa State College of Education Gumel. All these were reviewed under the following headings: conceptual framework, theoretical review, empirical studies as well as summary and uniqueness of the study.

2.2 Conceptual Framework

2.2.1 Attitudes

An attitude is a tendency to react favorably or unfavorably towards a designated class of stimuli, such as a custom, a caste, an institution or a nation. As such, an attitude can be observed directly, it has to be inferred from overt behavior, in verbal as well as non-verbal forms. More specifically, an attitude stands for response consistency to certain categories of stimuli. Actually, attitude is frequently associated with social stimuli and emotionally toned responses (Sidhu, 2005).

Attitude is highly concerned with an individual way of thinking, acting and behaving. It has very serious implication for the learner, the teacher, and any social group. Attitudes could be formed as a result of some kind of learning experiences.

An attitude can be seen as a tendency to react positively or negatively towards a particular object, individual or situations. For example a student who has a negative attitude towards computer studies is likely to be absent during its lesson.

According to Gordon A. (1979) as cited in Anastasi & Urbina (1997), Attitude is the most distinctive and indispensable concept in contemporary social psychology. Meanwhile Jung (1999) as cited in Sidhu (2005) defined attitude as a readiness of the psyche to act or react in a certain way. Attitudes very often come in pairs on conscious and the other unconscious. Attitude is an enduring disposition to consistency respond in a given manner. Attitude components are:

- Affective: Feelings or emotions towards an object.
- Cognitive: knowledge
- Behavioral: Predisposition to action intentions, behavioral expectation.

2.2.2 Measures of Attitude

Several techniques of assessing attitudes have been developed, having certain level of limitations. However, attitude can be assessed using two basic categories direct measurement and indirect measurement.

- Direct Measurement: These include questionnaires administrations, as in Thurston type scale, likert type scale, Guttman type scale and semantic differential.
- Indirect Measurement: In this regard projective techniques has to be applied, the person shall be presented with ambiguous or incomplete stimulus (picture or words). The stimulus requires interpretation from the person so that his/her inner views, opinion or attitude could be identified willingly or unwillingly, while preparing tools for the

assessment of attitudes, it is helpful to think of attitudes as having various dimensions which are: Favorableness, Intensity, Salience, Generality, Public vs private attitudes, Common vs individual attitudes (Sidhu 2005).

2.2.3 Test

According to Anastasi (1997) .A test is essentially an objective and standardized measure of a sample of behavior". To Munn "Test is an examination to reveal the relative standing of an individual in a group with respect to intelligence, personality, aptitude or achievement". Cronbach (1960) "A test is a systematic procedure for comparing the behavior of two or more persons".

However, test is a process of measuring a sample behavior of an individual. In other word is a systematic procedure for observing persons and describing them with either a numerical scale or a category system. Also test is an assessment intended to measure a test-takers knowledge, skills, attitudes or classifications in many other topic.

2.2.3.1 Types of Test

The nature or types of test is determined by the particular purpose of measurement. Various authors have given different classifications of tests. A number of categories of these classifications may appear to overlap. But based on this study, the researcher will only explain the two related types, which are the teacher made test and standardized test.

1. Teacher Made Tests

These are types of test which are prepared by the teacher with regard to curriculum. Teacher made test may reveal specific area of instruction or to assess students learning every period of

time or after a particular unit of study. A group of teachers may also join to frame good objective type items. Oral and essay tests are also teacher made tests. These tests cannot be recommended for use outside a school to which the teacher belongs.

2. Standardized Tests

These are also another type of tests which are constructed or developed by experts and published for use in many different schools and classrooms. These assessments are used in various contexts and serve multiple purposes. However, when tests are standardized it means, that a particular group of students will take the same test that will be scored and analyzed the same way. Scored result for each is compared for the rest of the group to see how well the students performed. Also the technical responsibility of standardization of a test can be discharged only by a trained and competent expert. During preparation the test is administered to a large sample of the population for determining the reliability, validity and establishing the norms.

However, these tests are marked by three important features which are brevity of response, extensive sampling and absence of personal judgment in scoring.

Therefore based on these classifications of tests the standardized tests are related to this study, based on the purpose, develop, administration and scoring. This is because the area of study is computer based tests (CBT) which is only adopted by JAMB as one of the professional examination body that comprises many different experts and specialists of test development, administration and scoring.

2.2.4 - Computer Based Test

Computer is a general purpose device that can be programmed to carry out a finite set of arithmetic or logical operations. Since a sequence of operations can be readily changed the computer can be solve more than one kind of problem. (Imogie 2008).

Computer based test is the use of computer to administer tests. Other terminologies used to described computer – based test (CBT) include computer assisted testing (CAT) computerized assessment, computer Aided Assessment (CAA), computer Based Assessment (CBT). Online Assessment, web – based Assessment, Technology Enhanced Assessment, Automation Assessment, and E – Assessment or Test or examination.(Mubashrah et al, 2012; Obioma et al. 2013; Alabi et al; 2012). Computer based test means the candidate sits in front of a computer and the questions are presented on the computer monitor and the candidate submits the answers through the use of keyboard or mouse (Ogunlade et al, n.d) Automation of educational Assessment, be it school – based assessment or other public examinations, can be described as the application of technology for the assessment of learning out comes; using machines to perform those operations which hitherto was performed wholly or partly by teacher or employees (Obioma, et, al 2013). Alibi et al. (2012) described computer based testing as a method of administering tests in which responses are electronically recorded, assessed or both. As the name implies, computer based test makes use of computer or an equivalent electronic device such as cell phone.

2.2.4.1 Types of Computer Based Test (CBT)

Computer based test (CBT) is group in to two, the linear/ fixed CBT and Adaptive CBT.

1. **Linear and Fixed Computer Based Test**

The linear and fixed computer based test, most similarly to paper – based testing is the random method which can be used to administer a fixed set of items to provide a modest test security benefit. Alabi, et al. (2012) defined a linear CBT as a full – length examination in which the computer selects different questions for individuals without considering their performance level.

2. Adaptive Computer Based Test

In CBT Adaptive testing when an examinee answer a questions correctly, the next test item has a slightly higher level of difficulty. And the difficulty of the questions presented to the examinee continues to increase until a question is answered correctly. Then a slightly easier question is presented. Alibi, et al. (2012) further explained that in a computer adaptive test each test – taker receives questions that are at the level of difficulty for his or her ability. After each question is answered, the computer uses the answer and all previous answers to determine which question will be presented next. This means that different test takers, even in the same hall on the same day will receive different questions. With this approach, collusion, giraffing, and many other forms of examination malpractices will be eliminated using CBT techniques.

2.2.4.2 Benefits of Computer Based Tests

Technology based Assessment or CBT provide opportunity to measure complex form of knowledge and reasoning that is not possible to engage and assess through the traditional PPT method. Abubakar and Adebayo (2014) observed that PPT Assess students only on cognitive abilities. They also noted that e – examination can be used to assess both cognitive and practical abilities. Cognitive abilities are assessed using e – testing software while practical abilities are assessed using e – portfolios or simulation software. Similarly, Obioma, et al (2013) opined that

automated assessment if carefully designed can comprehensively and reliable assess student in the three domain (cognitive, psychomotor, and affective) of learning.

According to Bodmann and Robinson (2004), computer based test offer several advantages over the traditional paper and pencil tests. Merrell &Tymms (2007) stressed the importance of using computer as assessment and instructional tools since they stimulate real world problems which are structured complex in nature. Explaining further, 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 or benefits of CBT to the education sector and the country in general include:-

1. Precision evaluation through adaptive testing, where the next question to the posed is determined by prior response(s).
2. Creation of digital records of student growth and development which can easily be passed along from grade to grade.
3. Greater flexibility with respect to location and timing of examinations.
4. Improved reliability because machine marking is much more reliable than human marking.
5. Impartial assessment – computerized marking does not "know" the students and so neither favour nor witch – hunt any candidate.
6. Greater storage efficiency – tens of the thousands of answer scripts can be stored on a portable hard disk of a server compared to the physical space required for paper scripts.
7. Enhanced question styles which incorporate interactively and multimedia.
8. Question banks and randomization of question and responses order to reduce cheating.
9. Immediate feedback can be given to the examinee.

10. Improved test security due to electronic transmission and encryption.
11. Saves time and manpower for the test administration.
12. Environment conservation as plants used for paper and pencil making will be preserved.
13. Lower long – term costs; CBT is going to be cheaper with time, once we have all the computer systems in the next 10 to 15 years, nobody will be complaining (Okoronkwo,2015).

2.2.4.3 An Overview of CBT Assessment Model in Nigeria Adopted by JAMB

Computer has been exerting a powerful and persuasive force on the lives of people. This force is felt on all aspect of human strata. The ever increasing ubiquity of information and communication technology (ICT) and its powerful influence even in the education sector is now being felt more in the 21stcentury. Nigeria's education sector cannot be left out, but has to leverage on the endless possibilities and opportunities offered by ICT for improving all aspects of teaching, learning and assessment especially in a constantly changing global world (Obioma, *et al*, 2013). The leveraging of ICT facilities to carry out quality assessment of learner is what is termed as computer based test (CBT).

Computer based test (CBT) is a technology based assessment model that provides opportunity to measure complex form of knowledge and reasoning that is not possible to engage and assess through traditional methods (Bodmann& Robinson, 2014). Computer Based test is also referred to as e – testing, e – examination, electronic examination or online assessment. The introduction of the CBT model in educational assessment and control is quite new in Nigeria educational system. The major proponent of CBT in Nigeria is JAMB (Ojerinde, 2014).

However, it is common place to see institutions in Nigeria adopt CBT as an assessment model to admit or screen student for entrance in to institution of learning (Sadiq&Oniawa, 2011).

JAMB, in 2013, introduced three sets of examinations, the paper pencil test (PPT), Dual Based Test (DBT) and Computer Based Test (CBT). This paradigm shift from the traditional PPT to an electronic edged test (CBT) was significant departure, an innovative drive and a conscious effort towards a widespread migration of educational assessment to another level. This was an unprecedented action towards bridging the digital divide between the analogue age and the computer age. Consequently, out of a total of one million, seven hundred and thirty five thousand, eight hundred and eight (1,735,808) candidates that sat for the 2013 UTME, One million six hundred and twenty nine thousand, one hundred and six (1,629,106) candidates used PPT, while fifteen thousand, five hundred and eight (15,508) candidates adopted the Dual Based test (DBT) model. The CBT on the other hand had a total of ninety one thousand, six hundred and ninety four (91,694) candidates (Ojerinde, 2014).

Whereas the result of CBT were released almost immediately after each day test, that of PPT took up to five days. The flexibility of the CBT with its attendant gains made JAMB to insist on CBT for all candidates writing the examination in the 2015 UTME (Ojerinde, 2014). According to him the introduction of CBT improved the efficiency of UTME, enhanced its credibility as well as reduced incidence of breaches of examination security.

The CBT administered by JAMB is an on screen presentation of multiple choice objective tests and the computer marks the responses provided by candidates (JAMB, 2015). As a candidate finishes the examination the system given him / her on the spot pictorial presentation his / her performance and the final result are made available to candidates on the

same day through short messages service (SMS), e- mail or by candidates checking JAMB examination result portal (JAMB 2013: Obioma, et al 2013).

Since JAMB is at the fore front of using CBT and had applied same in the conduct of her 2015 UTME, it is worth considering her CBT model in this chapter for a better understanding of its workability and implications. According to Ojerinde (2014), the JAMB CBT model is presented in figure 1 below.

JAMB CBT Model

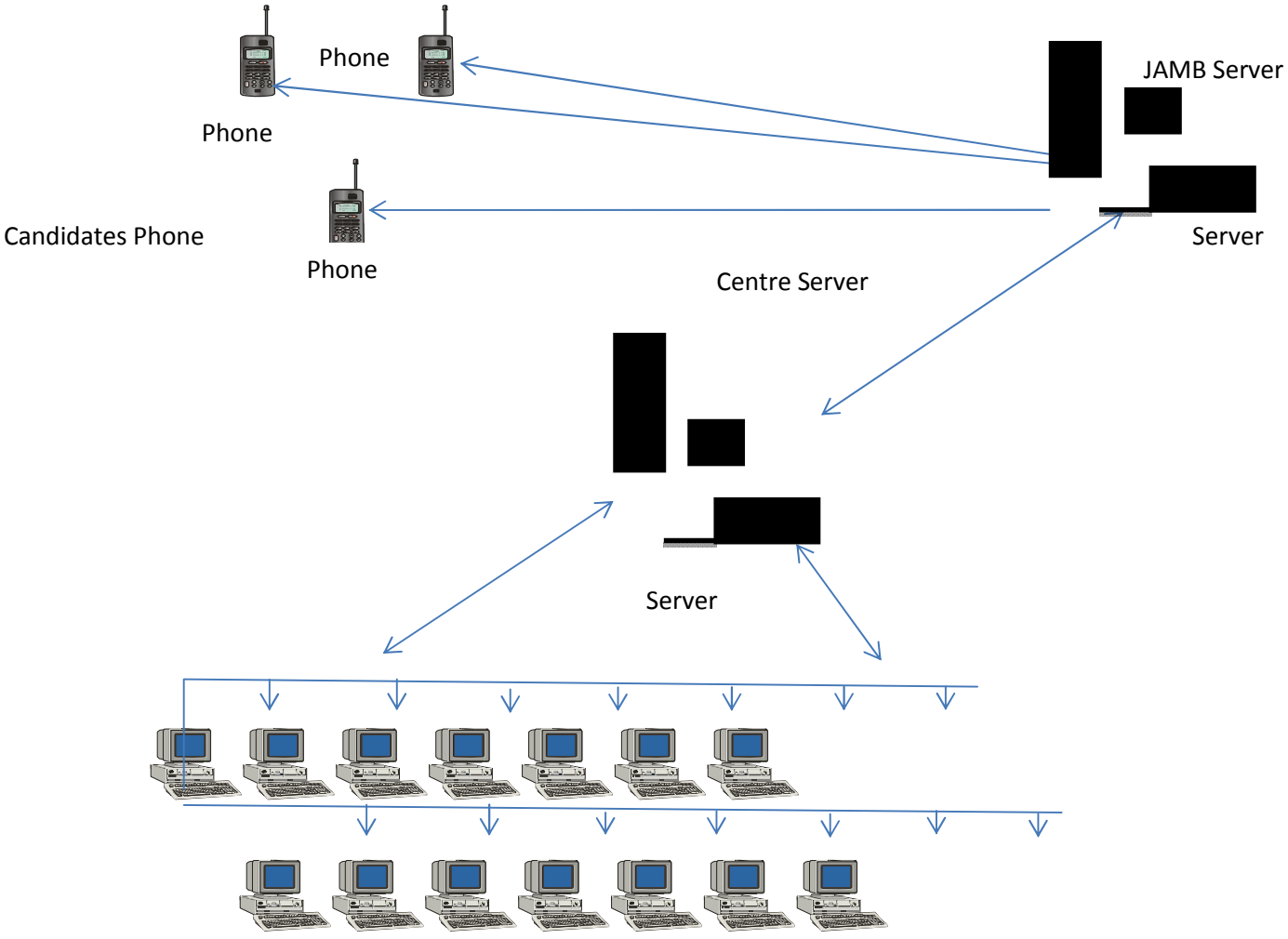

Figure 1: JAMB CBT Model.

From the JAMBs CBT model, it items for assessment are cloned, encrypted and stored in the examiners central servers after having passed through the necessary process of item preparation. The server is designed to keep track of the candidate by releasing information to their phones whenever needed. Thus the candidates have access to data via their phone e.gto obtain information about date of examination and scores obtained after examination.

Secondly the examiners central sever is linked to any of the base stations approved by JAMB as her test centers. The internal servers of these centers are linked to JAMBs central servers where operators can download candidates question types. The operators of these base stations have encrypted access codes to down – load these information and release them to the candidates. The candidate's computers are connected to the centre's server. Hence at the end of the examination, their solutions are up loaded via the centres to JAMB server electronically.

Using this assessment model, the process of transporting examination materials on the road or by air, there by posing risk to staff and increase cost of conduct of examination is eliminated. Again by this process leakage of examination questions is adequately controlled and indeed examination malpractice is drastically reduced to its lower level.

Furthermore, the CBT offers an environment for individualized testing, a situation where the individual is on his own writing his examination based on what he knows and not on shared knowledge as the PPT. Here, the candidates do not have time to ask each other questions or bother on what the other person is doing.

Moreover, the security control of the examination centre is enhancing. Such cases as impersonation other persons having access to question papers and therefore constituting a threat

to security agencies in an attempt to help their friends' brothers or wards do not exist. Hence the security agencies have less work at the examination centre.

In another dimension the CBT model offers a more flexible model in scheduling and rescheduling examination without the risk of leakage of questions which could result in extra cost of printing. It also offers other testee outsides the shores of Nigeria, the opportunity to write the examination anywhere, real time, online alongside with their colleaques in Nigeria.

Finally, one of the greatest benefits of CBT model is the quick release of results. Results are released almost within the same day based on the JAMBs experience in 2015. It is based on these gains over the PPT that prominent Nigerians and assessment experts have been the CBT as a ray of hope out of the present examination dilemma in which Nigeria education finds itself. For instance, the managing Director of Dragnet solution, Mr. Ikazoboh, opined that by now (21st Century), the country should be adopting CBT in virtually all of its educational institution especially at the secondary and tertiary levels (Nigerian Tribunes, June 12, 2013).

Also the Nigeria minister of education, Mallam Ibrahim Shekarau, in his reaction to the use of CBT in the 2015 JAMBs UTME stated that government was planning to construct eight (8) CBT centres for JAMB across the nation. (Premium times march 22, 2015). Whereas the voices of Nigerians applauding this paradigm shift in education assessment, giving the challenges faced by the PPT model, it is worth considering some of the anticipated challenges the CBT model is likely to face in Nigeria.

2.2.4.4 - Challenges of CBT Model

Baker – Eveleth et al, (2006) observed that implementing computer exams requires a sources testing environment, one that prevents students from seeking answers by scanning their

computer hard drives, instant messaging or e – mailing friends, or browsing the internet. To Fagbola et al, (2013). Lack of standardized/unified CBT development model alone undermines the success of the e- examination platform for real time adoption in practice. Fluck et al. (2009) is of ,the opinion that online assessment may not be effective for evaluating creativity, problem solving ability, critical thinking, reflection, or authentic learning, collectively the characteristic of deep and effective learning. Other challenges militating against the full adoption of CBT in educational assessment in Nigeria are quite enormous. These include:

1. Inadequate ICT infrastructure including hard ware, software and band width 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 need to be fast – tracked to reduce the cost of internet bandwidth access in Nigeria. However computer is a relatively new field in the Nigerian educational curriculum. Not many primary and secondary schools teach computer as a subject. Some that do at primary, secondary and tertiary level do so at theoretical level. The adoption of CBT model of assessment is a great challenge to those who do not have access to computer or ICT facilities. A part from the access to computer is the issues of computer phobia. Many persons are afraid of having to interact with the computer. It is worth noting that computer phobia alone could reasonably account for differences in performance especially for testees from the rural areas that may be using CBT for the first time, as was the case in the 2015 UTME examination (Ojerinde, 2015).

2. Power supply: - The challenge of erratic power supply in Nigeria has defied all attempts by various governments. Irregular and frequent interrupted power supply in Nigeria is a perennial problem affecting every aspect of the economy including education (Oye et al,2011). Most rural communities are not corrected to the national grid, the implication is that schools located there cannot undertake practical effectively. During JAMBs online UTME, cases of power failure interrupting the examination abound. This is because computers and other ICT facilities used in CBT are electrical / electronic gadgets. ICT facilities cannot function without electricity. Therefore the success of CBT is largely dependent on the availability and constant supply of electricity. Such scenario is not good and it is major drawback to a smooth implementation of CBT.
3. Students/ candidates in adequate 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 impact ICT skills to students, definitely the students cannot be adequately equipped for CBT. And this anxiety explains why the resistance to JAMBs full uses of CBT in 2015 UTME by student, parents and even teachers. Nigeria does not only lack ICT infrastructure, it also lacked the human skills and knowledge to fully integrate ICT in to secondary school education (Ilesanmi & Lasisi, 2015).
4. 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.

5. Acceptability:- There are series of reasons different stake holders are kicking against automation of examination in Nigeria. Dreher et al (2011) 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, teacher 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 and 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.
6. Software factors:- Currently, there is no software or multimedia that has universal application as far as CBT is concerned. School curriculum and education standard differ from one country to the other. Fluck et al. (2009) 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 application again, a corrupt software or network failure can cause rescheduling of the examinations.

7. Telecommunication services:- The transmission and reception of information between the servers and other computer in the network is on the basis of connectivity using internet access controlled by the telecommunication industry. According to Osei (2007), mobile telecommunication services covers about 60% of the territory of Nigeria. This implies that not all parts of Nigeria can be used for CBT assessment. The use of the CBT therefore is limited to areas with telecommunication and internet facilities. Sometimes even where these services exist, cases of networks failure are the other side of the story. In another related dimension, the internet bandwidth (MBPS) allocated to Nigeria is quite small compared to the population of users. The contracted internet connectivity capacity for Nigeria is low; Nigeria has not been granted the required hand width that launches her into the cheap, fast and reliable internet super high ways. These and many more is the dimension of internet services issues that may hinder the success of the CBT model of assessment in Nigeria.
8. Economic factor: In Nigeria, there is high rate of poverty. Most Nigerians cannot even afford three square meals. In most cases, students do not even have money to procure text books and other instructional materials. Schools are poorly equipped with relevant and modern textbooks let alone computers and other ICT facilities. For a successful CBT, the students are expected to be ICT complaint having laptops, printers, modern and other ICT materials with which they can interact and become conversant. To purchase these is a problem. With the economic situation in the country, such facilities are luxury to students and even institutions. The cost of servicing internet bills from internet services providers

(ISPs) is another dimension that places huge financial burdens on the users. In such a situation, CBT possesses a huge financial burden to the users.

9. ICT policy and Implementation:- According to the National policy on education (NPE) (Federal Republic of Nigeria, 2014), computer education is one of the core subjects from primary to tertiary level of education. Whereas these policy documents exist, their implementation is per from reality. The only way this policy was implemented was at tertiary institution level where computer education was introduced as a general studies courses with little or no practical experience attached. Government distributed computers to some federal College and tertiary institutions which were never used for the actual teaching of computer education to date. The sorry states is at the primary school level especially in public schools where these policies have not been fully effected.
10. Security: The use of CBT implies that the examiner sends the questions online to the e – examination centre, where the operator then sends the questions to the candidates' computer. Any information placed in the internet is vulnerable to hacking. Hacking of data places the data at high risk of manipulation. Candidates' information could be manipulated; items for examination could be manipulated and even stolen there by leading to a total loss of data. Olumorin, Fakomogbon, Fasasi, Olawole and Olafare (2013) contended that such situation may lead to e – cheating. This is possible as the hackers manipulate the data base to their advantage.
11. Technical know – how / man power:- The dearth of qualified computer engineers and software developers in Nigeria is another dimension to CBT. Nigeria has a gross shortage of experts in computer science. This is evident in the number of computer teachers across the country. Most of the people teaching computer in their school system have not been

adequately trained and in some instances operators of ICT facilities may not have received training at all (Kola, 1997).

2.2.4.5 - Possible Solutions of CBT

In order to ensure a successful transition from PPT to the CBT Assessment model the following suggestions are imperative for consideration. These are:-

1. Manpower development:- Conscious efforts should be put in place to develop the ICT manpower need of the country. Software developers and ICT engineers should be encouraged through patronage, training and retraining programmes. Technology is in response to man's wants (Opie, 2013). Hence indigenous experts who are acquainted with Nigerians problems and environment should be used as backbone for a successful transition to the CBT model.
2. Power supply:- The issue of power supply should be adequately addressed. Both the private and public sector should work consciously towards stabilizing power supply in the country.
3. Implementation of ICT and NPE policies:- Government should ensure the implementation of the relevant policy on education as it affects ICT in schools. The introduction of computer education at all levels of education should be urgently given attention. The relevant policy on ICT should take in to cognizance, the security implications of ICT and offenders should be made to face the wrath of the law.
4. ICT awareness:- Both the public and non-governmental organizations (NGOs) should intensify campaigns on ICT awareness and training. The cost of such training should be affordable to the public. Government can encourage this by building atleast one ICT training

centre in each Local Government Area and or using schools as pilot (pivot) schools for ICT training. Therefore this will facilitate e – examination in the country and ensure fairness and equity to the examinees.

5. CBT Tutorial:- Software developers should be encourages to design CBT tutorial guide. This will enable those who have not operated computer before or those who do not have an idea of CBT to become use to it before examination day.

2.3 Theoretical Framework

The theory reviewed which has practical implication to the study, was the classical test theory.

2.3.1 Classical Test Theory

The classical test theory (CTT) is a body of related psychometric theory that predicts outcomes of psychological testing such as the difficulty of items or the ability of test takers. It is a theory of testing based on the idea that a person's observed or obtained score on a test is the sum of a true score (error-free score) and an error score.

Classical test theory was born only after the following three achievements or ideas were conceptualized. One, a recognition of the presence of errors in measurements, two, a conception of that error as a random variable, and third, a conception of correlation and how to index it. In 1904, Charles Spearman was responsible for figuring out how to correct a correlation coefficient for attenuation due to measurement error and how to obtain the index of reliability needed in making the correction. Traub, R. (1997). Spearman's finding is thought to be the beginning of classical test theory by some Traub (1997).Others that had an influence in the CTT frame work includes: George Udny Yule, Truman Lee Kelley.

Classical test theory is regarded as the true score theory. The theory starts from the assumption that systematic effects between responses of examinees are due only to variation in ability of interest. All other potential sources of variation existing in the testing materials such as external condition or internal conditions of examinees are assumed either to be constant through rigorous standardization or to have an effect that is non-systematic or random by nature (Vander Linden &Humbleton, 2004). The central model of the classical test theory is that observed test scores are composed of a true score and an error score where the true and the error scores are independent.

2.3.1.1 Assumption of Classical Test Theory (CTT)

There are three main assumptions in the classical test theory (CTT). The first is that the error and the true scores from the same test have a correlation of zero. Hence, the variance of the observed score served as expected to be equal to the sum of the variance of the true and error scores.

The second assumption is that the errors terms have an expected means of zero. This mean that these random errors over many repeated measurement are expected to cancel out in the long term run leaving the expected mean of measurement error to be equal to zero. Once the error is zero, the observed score is equal to the true score.

The third assumption is that the error from parallel measurements is uncorrelated. Lord (1980) went further to posit that in the distinction of parallel measurement in CTT, two measure of x and x^1 are considered parallel if the expected value of the two observed scores x and x^1 are equal (i.e E [X]= E [x^1]) indicating that the two observed scores x and x^1 have the same true

score [$T=T^1$] and equal observed variance 0=2 [x] = 0-2 [x^1]. The error variance for the two parallel scores are usually equal for every population of examines $x = x^1$, if $x_i = x_2 = T_i + E_i$.

The classical theory assumes that each individual has a true score which would be obtained if there were no errors in measurement. However, because measuring instruments are imperfect, the scorer observed for each person may differ from an individual's true ability. The difference between the true score and the observed test score results from measurement error. The implication of the classical test theory for test takers is that tests are fallible imprecise tools. The score achieved by an individual is rarely, the individual true score. This means that the true score for an individual will not change with repeated applications of the same test .This observed score is almost always the true score influenced by same degree of error. This error influences the observed to be higher or lower.

Classical test theory utilizes traditional items and sample dependent statistics. These include item difficulty and item discrimination estimates, distracter analyzes, item test inter-correlations, and a variety of related statistics.

Most of psychometric analyzes have focused on examinee assessment at the test score level, rather than at the item level. Classical test theory also typically includes a measure for reliability of scores (i.e Cronbanch Alpha) and difficulty of the test (Randall 2010).

2.4 Review of Empirical Studies

After examining literature related to computer based testing, the researcher reviewed the related empirical studies to this study, where different researchers have been conducted to assess the student's attitudes and challenges towards computer based test, based on their positive and negative attitude, such as Adeyinka & Bashorun (2012) conducted a study on the

attitude of the students towards CBT at the university of Ilorin, Kwara state, Nigeria. In which the major objective of the study is to examine the students' attitude towards CBT. A case study research design was adopted to carry out the study. They used the whole students of the University of Ilorin as a population; the sample consists of 2209 undergraduate students selected from seven out of the ten faculties that made up the university. Data were collected through a computer based test attitudinal survey (CBTAS) and a focus group discussion. The result demonstrated that, generally respondents have positive attitude towards CBT. Moreover, it was suggested that alternative should be provided in form of a paper and pencil test for students who finds it difficult to read on the screen.

Dammas (2016) conducted a study on student's attitude towards computer based test (CBT) on chemistry courses. The study seeks to examine the attitude of students towards CBT at the kan-Saudi Arabia, Jeddah. Quantitative approach using survey questionnaire was adapted to carry out study using convenience sampling technique. The sample size consist of (60) undergraduate students who had taken the exam on CBT which are selected from college of science chemistry department to examine their attitude towards CBT. The research finding shows that, majority of the respondents have positive attitude towards (CBT), (83.7%) of the students said they were competent with the use of computer due to their experience. Lastly one major recommendation offered by this study is that, given students adequate training (demo exam) will push them for more confidants, and will eliminate computer anxiety and enhance performance and attitudes towards the CBT.

Abedalaziz, Jamuluddin & Leng (2013) investigated a study on measuring attitudes towards computer based test among post graduate students in Malaysia. The major objectives of this study is to find the over roll profile of postgraduate students attitude towards CBT, and to

determine the gender differences in terms of attitudes towards CBT among the students. Also this study is considered as a quantitative study with multi variant design. The sample size of the study was 289 postgraduate students enrolled in four educational master degree programs at the University of Malaysia. Computer attitude scales (CAS) were used and the survey questionnaires were distributed to the students. However, the major finding shows that participants have a high level of attitude towards computer based testing and also no significant differences were found between participants attitude towards CBT with regard to gender and the major recommendation was that; the lecturers in various department should plan more for training of ICT skills which will lead to the positive attitude of students towards computer based test.

However, another study conducted by Sanni & Muhammad (2015) to investigate on students' attitude towards UTME computer based testing (CBT) in Nigeria. The major objective of this study is to examine the attitude of students on the use of computer based testing in examinations, problems encountered by the students and prospective methods of enhancing CBT. The study employed the use of mixed methods qualitative and quantitative research methods. The population of the study consists of 534 students in Ahmadu Bello University (ABU), Zaria center who enrolled for UTME computer based testing in 2014 UTME. The sample size was determined in relation to the population of candidate in the region, simple random sampling was used to select the candidates for the study. Also the instruments used for this study is a questionnaire designed by researcher based on students attitude and challenges towards computer based testing. However, the major finding to this study was that, majority of the students have positive attitude towards CBT and some students were not familiar with computer. Lastly the recommendations were offered in this study such as JAMB should

collaborate with more universities, partners with private IT institutes across the country to provide more centers for students, also government policy on ICT should be fully implemented.

Ogundale & Olafare (2011) conducted a study to investigate on student attitude towards CBT in Nigerian universities. The major objective is to determine the students attitude towards CBT examination in Nigerian universities, also survey design was adopted in this study; students of universities of Nigeria comprised the population, also 1506 made up a sample size which were selected from four (4) university across the country, CBT questionnaire designed was administered to the students. However, one of the major finding to this study was that, the study discovered that, majority of the students have positive attitude towards computer based test in Nigerian universities, also the study reveals a significant differences in the attitude of students with regard to gender. But one major recommendation to this study was that, proposed model can be used for other related studies on the attitude of students towards computer based test, Nigerian universities should improve the efficiency of computer based test to increase the attitude of students.

Gavin and Mathew (2007) conducted a study to assess the attitude of children (Age 7 - 8) in computer based testing (CBT) in United Kingdom. Pilot study have been employed using online computer survey questionnaire, all year 3 class at primary schools in Lancashire, England were used as a population and 20 children of both genders (9 boys and 11girls) aged between 7 and 8 used as a sample. The findings shows that, the children have lower attitude toward computer based test, and no significant gender differences was determine; and one major recommendation was that, another study would be carried out with a group of children from another primary school to see whether the result are replicated.

Ikroma & Joshua. (2014) conducted a study on the problems encountered by students in computer based testing in Nigerian universities entrants' matriculation examination (Post-UTME). The major purpose of this study was to find out the major problem encountered by students during their CBT Post-UTME. The research was descriptive survey design. The target population for the study was the totality of final year (S S III) students in all Nigerian secondary schools. The sample size for the study comprised 600 final year students in 10 secondary schools in Cross River state, Nigeria. Using stratified random sampling techniques. Also a structured questionnaire designed (with reliability of .81) used to collect data which were analyzed with percentage and mean. Also the major findings from the analysis indicated that, most of the students were not properly ICT literate, network and server problems, long distance to CBT centre and issue of power shortage during CBT. It was also recommended that, JAMB and her accredited agents, educational and other institutions, other businesses and interested organizations should intensify efforts in creating more ICT centres for the conduct of CBT, such that candidates do not have to travel per distances to take this examination.

Adepoju (2016) conducted a study to evaluate the challenges encountered by the students in the first general computer based test in Nigeria; the major objective of this study is to find out the major challenges faced by the students during the first general computer based testing in 2015. The design employed in this study is the descriptive survey design and the target population comprised all the 19,729 candidates of the 2015 JAMB/UTME first general computer based test in Gombe state, while the sample size comprised 278 students of Gombe state university, school of Basic and Remedial studies and the federal college of education (TECH), Gombe pre-Nigeria certificate in education program that sat for the 2015 JAMB/UTME CBT. An instrument called computer based test challenges questionnaire (CBT-

CQ) was developed by the researcher and used for collection of data, and the findings of this study indicated that 54% of the candidates of the 2015 UTME CBT in Gombe state were not familiar with computer usage prior to the CBT, the test did not start on time, erratic internet networks during the examination, accidents of power failure during the examination. And the study recommends that appropriate measures should be taken by concerned stakeholders to find out means of eliminating and reducing the reoccurrence of such challenges in subsequent CBTs.

Onyibe, Juliana & Abdulhakim (2015) conducted a study to assess the challenges of computer based testing techniques faced by students in Nigeria. One major objective of this study is to find out major challenges faced by Nigerian students during UTME CBT and its prospects. The study was employed a descriptive survey design and the population of the study consists of all students of Lagos state university, while sample size comprised 452 students from five different faculties of the university, simple random sampling technique was employed. The instrument called challenges of computer based testing technique questionnaire (CCBTQ) was developed by researchers and used for data collection, descriptive statistics also employed to analyzed the collected data. One of the major finding was that, erratic power supply during the CBT, lack of computer skills by the students and network/internet fluctuation during the conduct of CBT, and the study recommended that challenges facing CBT should be addressed firstly by making computer education compulsory in all level of education and not elective as it is in the senior secondary schools curriculum presently, and all available resources should be channeled towards full implementation of CBT.

Singleton (2001) conducted a study to assess the challenges of computer based assessment in education among the students in department of psychology, university of Hull, England. The research design employed was survey design and all students in the department of

psychology used as a population and the sample size of the study were 90 students. Challenges CBT questionnaire was administered inform of test, random sampling technique was employed and the major finding of the study was that, reading text on a computer screen was difficult to the students because reading from computer screen has been found to be 20-30% slower than reading the paper based text, and one major recommendation of this study was that, the British psychological society should establish the process of instigating a programmes of training and accreditation of personnel in education in the use of CBA

Agommuoh & Akanwa (2016) conducted a study to find out UTME CBT threats and opportunities among the Nigerian students. This study employed the descriptive survey design to investigate the threats encountered and opportunities of physic students who took the UTME CBT physic examination 2015 and those who will take the exam next year 2016. The population of the study is (15688) SSII and SSIII students who took and who will take physics in UTME CBT in Ummuahia education zone of Abia state, Nigeria. The sample comprised 250 (170 male & 80 female). Purposive and cluster sampling techniques used. The instruments for data collection are the researchers developed structural questionnaire on the threat and opportunities on the four Likert scale type. Descriptive statistics inform of mean and standard deviation and t-test were used to test the hypothesis. The major finding of this study was that difficult in accessing JAMB website, anxiety due to low knowledge of computer operation by the students, faulty computers, abrupt shutting down of computers, failure of internet server, lack of internet connectivity, power failure and low booting of computers are the major findings, and the study was also recommended that, effort should be made by the government to supply functional computers in secondary schools and ensure that both teachers and the students are adequately trained to be computer literate, power supply should be constant among others.

2.5 Summary and Uniqueness of the Study

In the context of this study, computer based test was viewed from different definitions as given by various scholars. For this study, the term computer based test (CBT) it mean that, the assessment content is presented digitally using a form of technology such as computer. And attitude toward computer based test (CBT) in this study is defined as ways of thinking and feelings of the students towards taking computer based test (CBT).

With the development of information and communication technology (ICT) as an electronic based technology, generally used for connection, storing, organizing, processing and packaging information as well as providing access to knowledge, and other shortcomings or limitations affecting the conduct of PPT that forced this paradigm shift from paper and pencil to computer – based testing as a major way out of the PPT short comings.

However this chapter also overviewed the CBT assessment model in Nigeria adopted by JAMB where the JAMB introduced the first set of UTME through CBT in 2013 and fully implemented in 2015 to all applicants / candidates.

Also the theoretical aspect of the literature review looked at the prominent measurement theory which have practical application to this research, this is the classical test theory (CTT) relevancies were reviewed inform of it origin and assumptions. Review was also made on the students attitudes towards computer based testing (CBT), and the studies concerning the problems or challenges faced by students during the conduct of CBT, majority of the reviewed studies revealed that the students have positive attitudes towards CBT, while other studies reported opposite or in consistent results. This lapse is however the major reasons behind this study.

Notwithstanding the substantial justifications that makes this study unique from other studies are, firstly when compared with the study conducted by Adeyinka & Bashorun (2012) the study determined the attitude of students towards CBT, and was used the whole students of university of Ilorin as the population. The sample size was two thousand two hundred and nine (2209) students. was selected as a sample also data was collected through a computer based test attitudinal survey (CBTAS).The population of the present study consists of students of Jigawa state college of education Gumel who were four thousand five hundred and sixty seven (4,567),while the sample size of two hundred and fifty four (254) was used for the study. The previous study was suggested that alternative should be provided in form of a paper and pencil test for the students who find it difficult to read on the screen, while this current research suggested that tutorial in form of test drive should be compulsory to all students so the they have ample time to practice and get themselves acquainted with answering questions on a screen.

Also another unique reason with this current research when compared with the study conducted by Dammas (2016) on students attitude towards computer based test (CBT) on chemistry courses at the Kan- Saudi Arabia college of science Jeddah, the study was used convenience sampling technique to draw sixty (60) subjects as the sample size. While the presrnt study used cluster sampling technique to select sample size of 254.

Lastly, another reason that also makes this research unique from other studies is that, the study conducted by Adepoju (2016) to evaluate the challenges encountered by the students in the first general computer based test in Nigeria 19,729 candidates of 2015 UTME CBT in Gombe state was used as population, while two hundred and seventy eight (278) students of Gombe state university, school of basic remedial studies and the federal college of education

(tech) Gombe pre-Nigeria certificate in education program that sat for 2015 JAMB/UTME CBT as a sample size.

CHAPTER THREE

METHODOLOGY

3.1 – Introduction

This chapter was structured under the followings; the research design of the study, population, sample size and sampling technique, instrument for data collection, scoring procedure, validation of the instruments, data collection procedure as well as data analysis procedure.

3.2 Research Design

Descriptive survey design was used for the study. Descriptive survey design according to Ali (2006) is the design which uses the sample data of an investigation to document describe, and explain what is existent or non-existent, on the present status of a phenomenon being investigated. The main purpose of using this research design is to provide knowledge of opinions, attitudes and practices of the subject such knowledge has helped shaping educational policies and initiatives to change existing condition. Therefore, this design was considered appropriate for the study, because the study seeks to determine the present status of the attitudes of students and challenges of computer based testing among students of Jigawa State College of Education Gumel.

3.3 Population and Sample

3.3.1 Population of the Study

The population of the study comprises all the students of Jigawa State College of education. There are four thousand five hundred and sixty seven (4,567) students in the three level of the college (Source: Dean's student affairs records and statistics units). Out of which three thousand two hundred and fifty five (3,255) were male students and the remaining one

thousand three hundred and twelve (1,312) students were female. However, the following table shows the summary of the population based on schools and departments within the college.

Table 3.1: Summary of the population by Schools and Departments

S/N	School	Department	Population
1.	ECCE & PED	ECCE	58
		PED	62
2.	Arts & Social Sciences	Economics	295
		Geography	300
		History	140
		Islamic studies	650
		Social studies	490
3.	Sciences	Biology	45
		Physics	85
		Chemistry	123
		Mathematics	125
		Integrated science	70
		PHE	53
		Computer	45
4.	Languages	Arabic	780
		English	310
		Hausa	610
5.	Vocational & Applied Arts	Business education	115
		Agric. Double Major	93
		Home Economics	49
		Fine & Applied Arts	24
6.	SNE & ANFE	SNE	20
		ANFE	25
Total			**4,567**

Source: (Dean's student affairs record and statistics unit 2017).

3.3.2 Sample Size

The sample consists of two hundred and fifty four (254) students of Jigawa State College of education Gumel, it was drown using three steps of multistage cluster sampling. Multistage cluster sampling is a sampling method that divides the population into groups (or cluster) for conducting research (Ahmad, 2009). For selecting sample size, in the first step the researcher selected three schools out of six schools in the college, also in the second step the

researcher selected six department from the three selected schools with eleven departments, and lastly the subjects was selected randomly from the six selected departments, using research Advisor (2006) table for determining sample size. The following table shows the selected sample size of the population.

Table 3.2: Selected sample size of the population

School	Dept.	Pop. Within Dept.	Sample
ECCE/PED	ECCE	58	14
	PED	62	15
Sciences	Biology	30	7
	Mathematics	125	30
Arts & Social Sciences	Economics	295	71
	Social Studies	490	117
Total		**1060**	**254**

3.3.3 Sampling Technique

The sampling technique for the study was cluster sampling technique (multistage). Cluster sampling technique is a method where the researcher creates multiple clusters of people from a population where they are indicative of homogeneous characteristics and have an equal chance of being a part of the sample (Ahmad 2009). However for using this technique four steps must be followed, which are: Define the population, Divide the sample in to cluster, randomly select the clusters to use as a sample and lastly collect data from the sample (Lauren Thomas 2020). Therefore the choice of this technique was necessitated by the fact that, the college (study area) consists of schools within the college, Departments within the schools and students within the Departments.

3.4 Data Collection Instrument

The instrument used for this study was the adopted questionnaire designed by Adepoju & Dammas (2016), based on student's attitude and challenges towards Computer Based Test (CBT). The questionnaire was designed in such a way that it would provide answer to the research questions raised and the questionnaire have an instructive section on how the respondents would answer those questions. The questionnaire was structured in three sections. Section A is on demographic information of student which includes gender and career path way. Section B was consisted seventeen (17) questions that elicited information from student's attitude towards conducting Computer Based Test CBT. Finally section C consisted seventeen (17) polytomous items that elicited information on challenges of CBT faced by students. The items are structured in likert scale format.

3.4.1 Scoring Procedure

The scoring procedure for this study was on four likert scale format which include, strongly disagree SD=1, disagree D=2, agree A=3 and strongly agree SA=4. In this scoring procedure, the highest score = 68, the lowest score =17, range = 51, midpoint of the range = 26, midpoint of the range 26 + lowest score 17 = 43.Therefore any scores from 43 and above indicated a positive attitude of the students, and any scores below 43 indicated the negative attitude. However, in the analysis positive attitude was label by 1 and negative by 2.

3.5 Validation of the Instrument

3.5.1 Validity of the Instrument

The data collection instrument was validated by an expert in the field of research in tests and measurement to ensure its construct validity; this was done by presenting the instrument to

the expert. The expert was modifying the items of the instruments in line with the objectives of the study. Construct validity is the extent to which the items measures what it claims or the intended construct (Sidhu 2007).

3.5.2 Reliability of the Instrument

To determine the reliability of the data collection instruments, a pilot testing was conducted using the questionnaire. Cronbach Alpha statistical analysis was used to determine the internal consistency, the reliability coefficient of the instruments obtained was 0.7, which reported that the instrument is satisfactory to the current study. The cronbach alpha measure used to assess the reliability or internal consistency of a set of scale or items. Therefore cronbach alpha is a way of measuring the strength of the consistency (Goforth 2015).

3.6 Data Collection Procedure

The researcher obtained an introductory letter from the Department of Education, Bayero University Kano, which was addressed to study area that is Jigawa State College of Education Gumel. From which official permit was given by the college management concerning access to the data which the researcher used. After then the researcher personally visited the selected schools. i.e. School of Arts and Social Sciences, School of Science and School of ECCE/PED within the college for necessary arrangement with subjects used in the study. The questionnaires was personally administered to the subjects and retrieved back immediately for analysis. However, the researcher employed two research assistants from three respective schools.

3.7 Data Analysis Procedure

The data was analyzed by the use of descriptive statistics in the form of frequency count and percentage to answer the two research questions. Also inferential statistics in the form of t-

test to test the hypothesis one and ANOVA to test the formulated hypothesis two. This is because a t-test statistical significance indicates whether or not the difference between two group's averages most likely reflects a real difference in the population from which the groups were sampled. (Gosset, 2013).While the ANOVA can be used to test whether observed differences among more than two sample are as a result of chance or result of fundamental differences among corresponding population from which the sample are drawn(Binta 2009). However, hypothesis will be tested at 0.05 level of significances

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

4.1 Introduction

This study examines the Assessment of Students Attitude and Challenges of Computer Based Testing (CBT) among students of Jigawa State College of Education Gumel. Two research questions and two hypotheses were tested. The results are summarized, analyzed and interpreted using descriptive statistics in the form of frequency count and percentage as well as t-test for independent sample and ANOVA. The chapter was structured under the following sub heading as, data presentation and analysis, summary of the finding and discussion on findings.

4.2 Summary of Data

Table 4.1 Summary of Data on Students Attitude

Response on attitude	Frequency	Percentage
20 – 29	3	1.2
30 - 39	33	13.2
40 - 49	104	41
50 - 59	112	44.1
60 - 61	2	0.5
Total	254	100.0%

Table 4.1 above provides a descriptive statistics based on frequency distribution of students attitude. Therefore the first two class interval with 36 which represent 14.4% of the responses have Negative attitude, while the last three of the class interval with 216 represent by 85.6% of the responses have positive attitude towards CBT. Despite the fact that 5% in the third class interval (40 - 49) is for negative attitude towards CBT.

Table 4.2: Summary of the data of challenges on CBT

Items	Frequency		Percentage	
	A	D	A	D
The test did not start on time	100	154	39.1	60.9
I not familiar with answering question on computer screen	106	148	41.2	57.8
I could not locate my center on time	106	148	41.2	57.8
I was transferred to other Centre	113	141	44.2	55.8
Inadequate invigilator in my CBT Centre	117	137	45.7	53.3
The invigilator at the Centre are not properly ICT literate	108	146	42.2	57.8
Managers and other personnel of CBT Centre encourage cheating	103	151	40.2	59.8
The computers used for the CBT are not adequate	106	148	41.2	57.8
The fluctuation of the internet service is the problem of CBT	116	138	45.3	53.7
Slow booting of computer is a problem of CBT	123	131	48.1	51.9
I have problems with answering objective questions	106	148	41.2	57.8
Power interruption is a problem of CBT	129	125	50.4	48.6
The computer in the Centre are faulty	120	134	46.9	52.1
Pre – test accreditation delay my starting time	136	118	53.1	46.9
The test did not finish on time	134	120	52.3	46.7
I did not know how to operate computer	160	95	62.1	37.9
I did not write mock UTME CBT.	134	120	52.3	46.7

Table 4.2 provides the frequency distribution of the CBT challenges based on each item using frequency count and percentage

4.3 Data Analysis

4.3.1 Answer to Research Questions

Research Question 1: What is the attitude of students of Jigawa state college of education Gumel towards computer based testing (CBT)?

Table 4.3 Descriptive statistics of student's attitudes towards Computer Based Testing (CBT).

S/N	Students attitudes	Frequency	Percentage %
1.	Positive	205	80.7%
2	Negative	49	19.3%
	Total	**254**	**100%**

From the table 4.3 above it was observed that the students of Jigawa state college of education Gumel have positive attitude towards CBT, based on the analysis (205) represented by 80.7% of the respondents have positive attitude while (49) represented by 19.3% have a negative attitude towards computer based testing (CBT).

Research Question 2: What are the CBT challenges faced by students of Jigawa state college of education Gumel?

Using the frequency count and percentage the researcher determined the major challenges based on the four components of challenges faced by students of Jigawa state college of education Gumel, and was presented in the table 4.4 below.

Table 4.4: Descriptive statistics of CBT challenges

SN	Component of challenges	Frequency	Percentage %
1	Time factor	50	19.7%
2	Technical know how	70	27.6%
3	Technical problems	100	39.4%
4	Invigilators factor	34	13.4%
	Total	**254**	**100%**

Table 4.4 above shows the computer based test challenges faced by students of Jigawa state college of Education. The percentage of the responses was formulated based on the components of the related challenges from the questionnaire. The analysis showed that, the major challenges was the technical problem where 39.4% of the respondents agreed with the

items under this component, followed by 27.6% of the respondents agreed that technical knowhow of the students are the second major challenges faced by students during the conduct of CBT, also 19.7% of the respondents reported that time factor was also a challenge faced by students when writing CBT, while lastly 13.4% of the respondents agreed that invigilator factor was also another challenges faced by students during CBT.

4.3 Hypothesis Testing

4.3.1 Hypothesis One: There is no significance gender differences in the attitude of students of Jigawa state college of education Gumel towards computer based testing CBT.

Table 4.5: T-test independent sample for gender differences on the attitude of students of Jigawa state college of education Gumel towards computer based testing (CBT).

Gender	N	Mean	SD	df	t-cal	p-value	Remarks
Male	178	47.6	6.7	252	3.07	.002	Not Significant
Female	76	44.8	6.6				

P≤=0.05 level of significance

Independent sample t- test was conducted to determine gender difference on the attitudes of Jigawa state college of education students towards CBT. The result of the analysis indicated not significance differences as the p- value of 0.05 is greater than 0.002 (t (252) = p<.05). This suggested that there is no significance gender difference in the attitude of students of Jigawa state college of education Gumel towards CBT.

4.3.2 **Hypothesis Two:** There is no significant difference in the attitude of students towards CBT among Arts and Social Sciences, Sciences and ECCE/PED of Jigawa state college of education Gumel

Table 4.6: One way ANOVA was used to determine the attitude of student's towards CBT among Arts, Sciences & ECCE PED.

Source	SS	Df	MS	f	P-value	Remark
Between group	295.315	2	147.658	3.202	.042	Sig
Within group	11573.205	201	46.108			
Total	11868.520	253				

P≤= 0.05 level of significance

From table 4.6 above, the result of the ANOVA indicated that there is significant differences in the attitudes of students towards CBT among Arts, Sciences & ECCE/PED as the P-value of 0.05 greater than .042 (f (2,251) = p<.05). Since there is significant difference Turkey Post Hoc test was run to find out which group produces the differences.

Table 4.7: Post Hoc (scheffe test)

SN	(i) Career pathway	(j) Career pathway	MD (i-j)	SD Error	Sig
1	Arts & Social Science	Sciences	2.62	1.03	.032
		ECCE/PED	1.26	1.04	.448
2	Sciences	Arts & Sos/Sci.	-2.62	1.03	.032
		ECCE/PED	-1.36	1.05	.396
3	ECCE/PED	Arts & Sos/Sci.	-1.26	1.04	.448
		Sciences	1.36	1.05	.398

Table 4.7 above shows the post Hoc test which was suggested that Arts and social sciences (mean = 48.06, p= 0.032) sciences (mean = 45.44 p= 0.32) produces the differences.

4.3 Summary of the Findings

1. It was found that, 80.7% of the students have positive attitude towards computer based testing CBT.

2. The study also revealed that, the major challenges faced by students during CBT were the technical problems with 39.4% of the responses followed by technical knowhow of the students with 27.6%, than time factor with 19.7% and lastly invigilator factor with 13.3%.
3. The first hypothesis concluded that there is no significant gender differences in the attitude of students of Jigawa state college of education Gumel towards computer based testing CBT.
4. The second hypothesis was also concluded that, there is a significant difference in the attitude of students towards CBT among Arts, Sciences & ECCE/PED CBT among students of Jigawa state college of education Gumel.

4.3 Discussion on Findings

This study was examined the assessment of students attitude and challenges of computer based testing CBT among students of Jigawa state college of education Gumel. The discussions on the findings in relation to the analysis are presented sequentially as follows:

The first finding shows that, most of the students have positive attitude towards computer based test and this was in line with the research conducted by Adeyinka & Bashorun (2012) to determine the attitude of the students towards CBT at the university of Ilorin, Kwara state, Nigeria where the study was suggested that alternative should be provided inform of paper and pencil test for students who finds it difficult to read on the screen, but the current study was contradicts with the prior suggestion where tutorial in the form of test drive should be compulsory to all candidate, so that they can have ample time to practice and get themselves acquainted with answering questions on a computer screen. However, the finding was also in line with finding of Amnah & Dammas (2016) their findings shows that, majority of the

students have positive attitude towards CBT (83.7%). One major suggestion which was in line with the current study was that adequate training (demo exam) should be given to students; this will push them for more confidences and enhanced performance and attitude towards the CBT. Similarly the findings was in line with the findings of Abdul aziz, Jamuluddin & Leng (2013), their finding shows that participants have a high proportion of attitude towards CBT and one major recommendation is that, lecturers in various department plan more for training of ICT skills which lead to the positive attitude of student towards CBT. Also another finding that was in line with this current study is the study by Sanni & Muhammad (2015), the findings shows that majority of the students have positive attitude towards CBT. Also another in line findings by Ogunlade & Olafare (2011) their findings discovered that majority of the students have positive attitude towards CBT. But only one study finding was contradict with the current study, finding from Gavin & Mathew (2007) shows that, the children have lower attitude toward computer based test.

The second finding which revealed that, some of the major challenges associated with effective conduct of computer based test are: the technical problems and the technical knowhow of the students' e.t.c. These was in line with the study conducted by Adepoju (2016), his finding shows that the CBT test did not start on time, erratic internet networks during the examination, accidents of power failure during the examination etc are among the major problems associate with computer based test. Also another in line finding with the current study is the finding by Joshua & Ikroma (2014), their finding revealed that, the major problems encountered by students was that, most of the students were not properly ICT literate, network and server problems, long distance to CBT centre among others, and the major recommendation was that, government, institutions and interested business organization should intensify efforts

in creating more ICT centres for the conduct of CBT such that candidate do not have to travel for far distance to take this examination. However, this finding was also in line with the finding of Onyibe & Juliana (2015), where the study revealed that, erratic power supply during CBT, lack of computer skills by the students and network internet fluctuation during CBT. And one major recommendation to overcome the CBT challenges was that, computer education should be compulsory at all level of education this will help the full implementation of the CBT. However, another finding which was in line with this study is the finding by Agommuoh & Akanwa (2016) their finding shows that, difficulty in accessing JAMB website, anxiety due to low knowledge in computer operation among other are the major problems, and the study was recommended that, government should supply functional computers in secondary schools and ensure that both teachers and students are adequate trained to be computer literate and power supply should be constant.

Also the third finding which revealed that, there is no significant gender differences in the attitude of students of Jigawa state college of education Gumel towards computer based testing CBT. And this was in line with the study by Abedalaziz, Jamuluddin & Leng (2013), their finding shows that, no significant differences were found between participants attitude towards CBT with regard to gender and the major recommendation was that; the lecturers in various department should plan more for training of ICT skills which will lead to the positive attitude of students on computer based test. Also the finding of this current study was also in line with the study finding of Gavin & Horton (2007) which shows that no significant gender differences was determine.

The last finding which concludes that, there is significance differences in the attitude of students towards CBT among Arts & Social Sciences, Sciences and ECCE/PED among students

of Jigawa state college of education Gumel. The finding was not inline by any study conducted previously.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 **Introduction**

This chapter presents the summary of the study, conclusion of the study as well as recommendations.

5.2 Summary

The researcher investigated the attitude of students and challenges of computer based test among student of Jigawa state college of education Gumel, where the objectives determined, the attitude of students towards computer based test and found out major challenges faced by the students during the conduct of CBT and also significance differences in the attitude were also determined with regard to gender and between Arts & social sciences, sciences and ECCE/PED among the students of jigawa state college of education Gumel, two research questions were raised and similarly two hypothesis were tested at 0.05 level of significance. However, one of the significance of this study is to add the literature on the future research that focused on attitude and challenges towards CBT. Furthermore, the scope of the study focused on students of Jigawa state college of education Gumel who sat for UTME computer based testing CBT 2016/2017 academic session and the study was delimited to other tertiary institution in the state such as Bilyaminu Usman Polytechnic, Hadejia, Hussaini Adamu Polytechnic Kazaure among others.

However, chapter two of this study reviewed current and related literature on the attitude of students and challenges towards CBT, where conceptual framework were reviewed in term of

attitudes, test, classification of test, computer based testing, its types benefits and challenges of CBT. Also in the theoretical framework, the theory which have practical implication to the study was reviewed (classical test theory) its origin and assumption, similarly many related empirical studies were reviewed by linking them with this current study, also this study was unique to other previous studies in terms of many aspect such as location of the study, population sample size as well as the instrument for data analysis.

Also chapter three was extensively discussed on how the researcher conducted the study, in which the study was descriptive survey design since it provide knowledge of opinion, attitudes and practices of the subject, and population of the study was comprised all the students of Jigawa state college of education Gumel and there was four thousand five hundred and sixty seven (4,567) students, from there the researcher was drown the sample size of two hundred and fifty four (254) students from six randomly selected department within the three randomly selected schools using Research Advisor (2006) table for determined sample size. Furthermore cluster sampling techniques was used, students attitude and challenges towards computer based testing questionnaire (AATACCBTQ) was administered to collect data from the respondents, however descriptive statistics in form of frequency count and percentage to answer the two research questions as well as inferential statistics in form of the t-test and ANOVA were employed to test the formulated hypothesis at 0.05 level of significance.

Chapter four, it was where the data was presented and analyzed using descriptive and inferential statistical package, where the table 4.3 presented the analysis of research question one which was revealed that 80.7% of the students have positive attitudes towards CBT, while only 19.3% have negative attitude towards CBT. Table 4.4 was also presented the analysis of research question two which reported the key challenges faced by students during UTME CBT

such as the technical problems with 39.4%, technical knowhow with 27.6% and time factor with 19.7% based on the component of the challenges. However table 4.5 presented the analysis on gender differences with regard to the students attitude towards CBT, where the analyzed data revealed that, there is no significant gender differences in the attitudes of students jigawa state college of education Gumel (t(252) = P < .05), and lastly table 4.6 presented the analysis of students attitude towards CBT among Arts, Sci., ECCE/PED which also revealed that, there is significant differences in the attitude of students towards CBT among Arts, Sciences & ECCE/PED (f(2,251) = P<.05). Since the significant difference was determined in the attitude of students towards CBT, among Arts, Sciences & ECCE/PED, table 4.7 presented the post Hoc test to find out which group produces the differences.

However, chapter five presented the summary, conclusion and recommendations as well as the recommendations for further studies.

5.3 Conclusion

The opportunities for having effective conduct of computer based testing CBT to the students, this study was concluded that, majority of the students have positive attitudes towards computer based testing despite the fact that the students were not familiar with answering question on computer screen. Also the study concluded that, the major challenges encountered by the students during the UTME CBT were technical problems such as lack of efficient power supply at the Centre, the computer used for the CBT were not adequate, the computers in the CBT centres were faulty and some of the students were transferred to other centre to take or complete the test because of the technical problem in the centre during the CBT and the technical knowhow of the students such as some students was not familiar with answering

question on a computer screen, some they did not know how to operate computer and lastly in some centres most of the invigilators were not properly ICT literate among others. Furthermore, the study was concluded that, there is no significant gender difference in the attitude of students of Jigawa state college of education Gumel towards CBT, and lastly the study concluded that there is significant difference in the attitude of students towards CBT among Arts & social sciences, Sciences & ECCE/PED among students of Jigawa state college education Gumel.

5.4 Recommendations

5.4.1 Recommendations from the Study

In view of this study the following recommendations were offered:

1. Power supply, the issue of power supply should be adequately addressed. Both the private and public sector should work consciously towards stabilizing power supply in the country.
2. Government should provide each local government areas of the federation with well-equipped and functional CBT centre in order to solve the problem of faulty computer or any other technical problems that lead the students to transfer to other centre to take or complete the test.
3. Government should ensure the implementation of the relevant policy on education as it affects ICT in schools. The introduction of computer education at all levels of education should be urgently given attention. Therefore this would help the students to be familiar and acquainted with computer.
4. Manpower development, conscious effort should be put in place to develop the ICT manpower need of the country; this would help the invigilators at the CBT centres to be properly ICT literate.

5. Tutorial in the form of test drive should be compulsory to all candidates, so that they can have ample time to practice and get themselves acquainted with answering questions on a computer screens.

5.4.2 Recommendations for Further Studies

1. A similar study should be conducted in Bilyaminu Usman Polytechnic Hadejia
2. A similar study should be conducted in Hussaini Adamu Federal Polytechnic Kazaure
3. A similar study should be conducted in Jigawa State Polytechnic Dutse
4. A similar study should be conducted in Jigawa State College of Islamic and legal Studies Ringim.
5. A similar study should be conducted in Federal University Dutse
6. And lastly a similar study should also be conducted in Sule Lamido University Kafin Hausa.

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APPENDIX ONE: RESEARCH INTRODUCTORY LETTER

DEPARTMENTAL LETTER OF AUTHORITY FOR RESEACH

Department of Education
P.M.B. 3011
Kano State
Head Prof. Bello A. Bello
Email: **hodedu@buk.edu.ng**
Date 9/7/18

B.U.K.
Bayero University, Kano

Dear Sir,

LETTER OF INTRODUCTION

This is to certify that: Usman Abdulkadir with Registration Number: EPSI 15/MED00004 is our student in the Department of Education Bayero University, Kano

Kindly render any assistance he/she may require from you.

For
Prof. Bello A. Bello
Head of Department

DEPARTMENT OF EDUCATION
BAYERO UNIVERSITY KANO
Date
Sign

APPENDIX TWO: RESEARCH ADOPTED QUESTIONNEIRE

ASSESSMENT OF STUDENTS ATTITUDE AND CHALLENGES OF COMPUTER BASED TESTING QUESTIONNAIRE (ASAACCBTQ)

INSTRUCTION: This instrument is divided into three (3) sections. Please respond to each statement in the table below by ticking (√) against the appropriate response to indicate the degree to which you agree or disagree with the statement. Your responses will be used treated with utmost confidentially and will be used for research purpose only

Key: SD = Strongly Disagree

D = Disagree

A = Agree

SA = Strongly Agree

SECTION (A): Personal Information

Gender: Male [ ]

Female [ ]

Career Pathway: Arts and social sciences [ ]

Sciences [ ]

ECCE/PED [ ]

SECTION B: General Attitude of Student's Towards UTME Computer Based Testing.

1.	I like the UTME computer based testing	SD	D	A	SA
2.	The training received on CBT mode of examination prior the exams greatly help my performance				
3.	CBT is easy to read on screen				
4.	The typing speed influenced the completion of the UTME CBT on time				
5.	The previous experience I had in computer training influence my performance of UTME CBT				
6.	I enjoyed writing test on computer				
7.	I benefit from CBT				
8.	CBT is important for my career				
9.	Writing CBT makes me nervous				
10.	CBT is interesting				
11.	CBT was very efficient				
12.	CBT provides me a positive experience				
13.	The CBT causes a concern				
14.	CBT was conducted in a helpful environment for examinees				
15.	I prefer receiving my exams results automatically utilizing the CBT system				
16.	The CBT increases my test anxiety				
17.	I am comfortable writing computer based tests/exams				

SECTION C: Challenges faced by students during computer based testing (CBT).

S/N	Items	SD	D	A	SA
1.	The test did not start on time				
2.	I am not familiar with answering questions on a computer screen				
3.	I could not locate my center on time				
4.	I was transferred to another centre to take/complete the test which lead to not complete my test				
5.	Inadequate invigilator in my CBT centre				
6.	The invigilators at the centre are not properly ICT literate.				
7.	Managers and other personnel of CBT centre encourage cheating.				
8.	The computers used for the CBT are not adequate				
9.	The fluctuation of the internet service is one of the problems of computer based testing.				
10.	Slow booting of computer is one of the problems that students encounter during the CBT				
11.	I have problems with answering Objections questions.				
12.	Power interruption is one of the problems faced by students during computer based testing.				
13.	The computer in the CBT centre are faulty				
14	Pre - test accreditation delay my starting time				
15	The test did not finish on time.				
16.	I don't know how to operate computer				
17.	I did not write mock UTME CBT.				

Thanks for your anticipated cooperation

APPENDIX THREE: ANALYSIS OF TWO RESEARCH QUESTIONS

Frequencies

[DataSet1] C:\Users\Usman Abdulkadir\Documents\maina..sav

Statistics

LEVELATTD

N	Valid	254
	Missing	0

LEVELATTD

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Positive	205	80.7	80.7	80.7
	Negative	49	19.3	19.3	100.0
	Total	254	100.0	100.0	

Frequencies

[DataSet1] C:\Users\Usman Abdulkadir\Documents\maina..sav

Statistics

COCBT

N	Valid	254
	Missing	0

COCBT

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Time Factor	50	19.7	19.7	19.7
	Technical Knowhow	70	27.6	27.6	47.2
	Technical Problems	100	39.4	39.4	86.6
	Invigilator factor	34	13.4	13.4	100.0
	Total	254	100.0	100.0	

APPENDIX FOUR: ANALYSIS OF TWO HYPOTHESES

Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
SACBT	Male	178	47.6348	6.76200	.50683
	Female	76	44.8026	6.68136	.76640

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means	
		F	Sig.	t	df
SACBT	Equal variances assumed	.399	.528	3.068	252
	Equal variances not assumed			3.082	143.329

Independent Samples Test

		t-test for Equality of Means			
		Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence ... Lower
SACBT	Equal variances assumed	.002	2.83220	.92329	1.01385
	Equal variances not assumed	.002	2.83220	.91883	1.01598

Independent Samples Test

		t-test for Equality of ... 95% Confidence ... Upper
SACBT	Equal variances assumed	4.65055
	Equal variances not assumed	4.64842

```
ONEWAY SACBT BY Career_Path_Way
  /STATISTICS DESCRIPTIVES HOMOGENEITY
  /MISSING ANALYSIS
  /POSTHOC=TUKEY ALPHA(0.05).
```

Oneway

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[DataSet1] C:\Users\Usman Abdulkadir\Documents\DATA ANALYSIS.sav

Descriptives

SACBT

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
Art & S/SC	87	48.0690	6.50187	.69707	46.6832	49.4547
Sc	84	45.4405	8.18808	.89339	43.6636	47.2174
ECCE/Ped	83	46.8072	5.37940	.59047	45.6326	47.9819
Total	254	46.7874	6.84917	.42976	45.9410	47.6338

Descriptives

SACBT

	Minimum	Maximum
Art & S/SC	28.00	62.00
Sc	23.00	61.00
ECCE/Ped	33.00	56.00
Total	23.00	62.00

Test of Homogeneity of Variances

SACBT

Levene Statistic	df1	df2	Sig.
9.018	2	251	.000

ANOVA

SACBT

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	295.315	2	147.658	3.202	.042
Within Groups	11573.204	251	46.108		
Total	11868.520	253			

Post Hoc Tests

APPENDIX FIVE: RESEARCH ADVISOR (2006) TABLE FOR DETERMINING SAMPLE SIZE

Required Sample Size†

Population Size	Confidence = 95% Margin of Error				Confidence = 99% Margin of Error			
	5.0%	3.5%	2.5%	1.0%	5.0%	3.5%	2.5%	1.0%
10	10	10	10	10	10	10	10	10
20	19	20	20	20	19	20	20	20
30	28	29	29	30	29	29	30	30
50	44	47	48	50	47	48	49	50
75	63	69	72	74	67	71	73	75
100	80	89	94	99	87	93	96	99
150	108	126	137	148	122	135	142	149
200	132	160	177	196	154	174	186	198
250	152	190	215	244	182	211	229	246
300	169	217	251	291	207	246	270	295
400	196	265	318	384	250	309	348	391
500	217	306	377	475	285	365	421	485
600	234	340	432	565	315	416	490	579
700	248	370	481	653	341	462	554	672
800	260	396	526	739	363	503	615	763
1,000	278	440	606	906	399	575	727	943
1,200	291	474	674	1067	427	636	827	1119
1,500	306	515	759	1297	460	712	959	1376
2,000	322	563	869	1655	498	808	1141	1785
2,500	333	597	952	1984	524	879	1288	2173
3,500	346	641	1068	2565	558	977	1510	2890
5,000	357	678	1176	3288	586	1066	1734	3842
7,500	365	710	1275	4211	610	1147	1960	5165
10,000	370	727	1332	4899	622	1193	2098	6239
25,000	378	760	1448	6939	646	1285	2399	9972
50,000	381	772	1491	8056	655	1318	2520	12455
75,000	382	776	1506	8514	658	1330	2563	13583
100,000	383	778	1513	8762	659	1336	2585	14227
250,000	384	782	1527	9248	662	1347	2626	15555
500,000	384	783	1532	9423	663	1350	2640	16055
1,000,000	384	783	1534	9512	663	1352	2647	16317
2,500,000	384	784	1536	9567	663	1353	2651	16478
10,000,000	384	784	1536	9594	663	1354	2653	16560
100,000,000	384	784	1537	9603	663	1354	2654	16584
300,000,000	384	784	1537	9603	663	1354	2654	16586