

Perceptions of Undergraduate Students towards Computer-Based Test at The Federal University of Technology, Minna, Nigeria

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ABSTRACT

This study investigated the assessment of Computer-Based Test (CBT) at the Federal University of Technology (FUT), Minna. The study employed survey questionnaire to collect data from 377 undergraduate students from the university using stratified random sampling method. The response rate was 93%. Overall findings revealed that majority of the respondents (49%) were very strongly disagreed, that they feel nervous working with computers, while 43% were very strongly agreed that their previous experience with computer affects their performance in CBT. In other case, 110 (31%) of respondents were very strongly agreed that they find it difficult to launch system calculator. While 212 (60%) of the respondents claimed very strongly agreed that the time allotted to calculation-related test is insufficient. The study concludes that CBT at the FUT Minna is not without its own hiccup as there are problems associated with it. The study recommends that the school management should consistently maintain the CBT technologies, increase the level of transparency in result presentation and allot more time for calculation-related courses.

KEYWORDS: computer-based test, performance, CBT technology, calculation tests

Aims Research Journal Reference Format:

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INTRODUCTION

Oxford advanced dictionary defines assessment as an opinion or a judgment about somebody or something that has been thought about very carefully. Within the educational circle, the term assessment means the variety of approaches that teachers or educators use to evaluate or judge, measure, and document the academic preparedness, learning progress, and skill proficiency of students from pre-nursery through college or university and adulthood. Academic evaluation seeks to find out how effectively students are studying and learning and is an inclusive element of the quest for improved education. It offers feedback to pupils or students, teachers, parents, administrators and the general public about the effectiveness of academic services.

The primary purpose of academic assessment is to enhance students' understanding and teachers' teaching as each answer the data it provides. Assessment ought to mirror smart instruction; occur unceasingly as a part of instruction; and provide data regarding the amount of learning or understanding that students square measure reaching. To ensure that students gain insight into their understanding and learning, regular feedback is important. Learners need to keep track of their learning and continuously evaluate their approaches as well as their present levels of understanding (Bransford, Brown & Cocking, 1999). Assessment and feedback are important for helping people learn.

Utilizing computers to aid in assessment task has become a subject matter for many years; nonetheless, innovations have continuously transferred ancient assessment methods into computer environments. Additionally, in order to mechanically grade students' projects or tasks, types of assessment approaches are more restricted (Elliot, 2008). Our lives have been affected by the revolution in the field of information communication technology. Therefore a replacement paradigm for assessment in womb-to-tomb learning is turning into necessary. In general, assessment has completely different ways in line with its functions. The two main styles of these ways are formative and summative assessment.

Formative assessment is utilized to grant feedback to learners and academics so as to guide their efforts toward attaining the objectives of the educational process. Summative assessment are employed to evaluate learner's understanding and learning at the conclusion of a specific end of learning—usually at the end of course, training, semester, program, or school year. Summative assessments are graded tests, assignments, or projects that are used to determine whether students or learners have learned what they were expected to learn during the defined learning period. According to Bennett (2002), technology is a vital part of recent learning system. As a result, technology is additionally progressively required for the evaluation method to be authentic. Electronic assessment systems will be organized consistent with the character of the students' response to check things into; fastened response systems and free response systems (Culwin, 1998). Consistent with Culwin (1998), fastened response systems that conjointly remarked as objectives, compels the student to possess a hard and fast response by choosing resolution from a pre-prepared list of solution options. Where, within the free response systems non-objective or essay, unanticipated answers make the student's response. In such variety of systems, skills like meta-skills, essay writing and programming are assessed instead of reality or information assessment that represents the most domain of the primary sort. Futhermore, portfolios can be accustomed to evaluate learning outcomes. Moreover, according to Chun (2002), portfolios symbolize the most effective purpose of students' learning, what they gather, put together and reproduce on samples square measure diagrammatical in their portfolios.

Computers have been used for many years to help assessment. The use of computers for the purpose of assessment is known as Computer-Based Test (CBT). One amongst the earliest tries of *Victimisation* computers to help academic and assessment method refers to the first 1960's philosopher (Programmed Logic for Automatic Teaching Operations) project was started at the University of Illinois (Woolley, 1994). TICCIT (Time-Shared, Interactive, Computer-Controlled, Information Television) commenced in 1967, is another example of a large-scale venture for *Victimisation* computer systems in education. The history of electronic test can be traced to the use of computer system to mechanically evaluate the students' programming assignments (Douce, Livingstone & Orwell, 2005). One of the first tries of *Victimisation* computer systems to alter the method of evaluating students' programming task was the "Automatic Grader" (Hollingsworth, 1960). Instead of *Victimisation*, *Programas*, a compiler for the programming assignments, conjointly aided the scholar to higher learn programming, and also helps the instructor to supervise a larger variety of students at the same course. Another use for the automated critic was distance learning (Hollingsworth, 1960). Writers of "Automatic grading programs, Communications of the ACM" conferred another system for mechanically evaluating programming assignment written in *Algol*. *Algol* system was utilized by the scholars of University of Stanford in their numerical analysis course to evaluate their programming assignment. The system was accountable of information supply, for recording issues and period of time observation.

Assessment contends an important part for promoting learners' performance and conjointly the level of excellence of educational tools. Assessment as an integral a part of the educational style was laid low with the revolution of personal computers within the 1980's (Reiser, 2001). Assessment Systems in different fields like arithmetic (Rottmann & Hudson, 1983) and chemistry (Myers, 1986) appeared once shortly. The 1990's was laid low with the vital influence of the World Wide Web (WWW), ever since electronic test systems began to be web-based.

Blackboard.com allows automatic grading of multiple alternatives. Systems like QUIZIT (Tinoco, Fox & Barnette, 1997), WebCT (WebCT, 2008), ASSYST (Jackson & Usher, 1997) and PILOT are samples of web-based systems with capability of electronic assessment and grading. According to Lei (2006), recent examples present an electronic web-based assessment system that applies Bloom's classification to assess the results of learners and the educational process within the tutors in real time. In an exceedingly step towards a totally automatic information assessment, Guetl (2007) introduced the "e-Examiner" as a tool to aid the assessment approach by mechanically generating, take a look at things for open-ended responses, marking students' short free text answers and providing feedback.

In Nigeria, there are tertiary institutions using the computer-based test for their assessment and these includes but not limited to University of Ilorin, Federal University of Technology, Minna, Nigerian Open University of Nigeria, etc. Olawale and Shafi'i (2011) explained that these universities are operating in the same way. According to Olawale, Shafi'i and Fluck (2014), the Federal University of Technology (FUT) Minna approved the use of computers in examinations in February 2010. The use of electronic examination has been compulsory for all 100 level students and for General Studies (GST) courses in the school.

The University has also adopted this method of assessment in evaluating students sitting for Post-Unified Tertiary Matriculation Examination (UTME), remedial and Interim Joint Matriculation Board (IJMB) examinations. The use of computer systems simplifies the whole assessment cycle, including generation, execution, evaluation, presentation as well as archiving. These saves money and time while improving transparency and reliability. Proponents for the computer-based test argue that it not time-consuming but rather time saving, (McCormack & Jones, 1998; Ryan, Scott, Freeman & Patel, 2000).

One of the contenting problems of the use of computer-based test is technical problems associated with the use of computer to conduct test. Most times, students complain about computer freezing in the course of their assessment, the use of in-built computer calculator which makes it cumbersome for students. Some students are of the opinion that some courses are better with computer-based test than others. The issue of prior computer skills is also a problem affecting computer based assessment.

1.1 Statement of The Problem

Computer-Based Test (CBT) has been recognized both for its less-time consuming, cost and better performance. But its advantage to the school authority should not be over-emphasized as Hoyle (1986) in Kyoshiba (2009) asserted that schools are set up with the goal of imparting knowledge, understanding as well as skills to those who go through them and behind all this is the idea of improving the student's academic achievement.

It is vital to examine the relationship between this mode of assessment and its effects on students' performance, because the assumption of comparability between CBT and performance without subjecting it to research process is inappropriate. While electronic problems are rare, they have been known to occur (Chin, 1990), some students reported that they face technical difficulties most times like freezing of computer systems, unable to navigate to the next or previous question, unable to submit their test, power outage during test period and crashing of computer systems. Others complained about difficulty taking calculation-related courses or some specific courses using computers (Jimoh, Shittu & Kawu, 2012), like unable to use the system calculator effectively and the time wasted to start up the calculator. While some students are more concerned about their level of computer familiarity, others students have a general anxiety about the computer itself (John, Cynthia, Judith & Tim, 2002). Others say that they find it difficult to read on computer screen unlike the paper.

It therefore remains uncertain whether the problems identified affect Students' performance in CBT at the Federal University Technology (FUT), Minna. In this study, an attempt is made to answer the question: What is the relationship between the problems identified on the use of CBT and academic performance of the FUT Minna undergraduate students?

1.2 Aim and Objectives of The Study

To find out if factors like the technical difficulties, course type, prior computer skills and computer anxiety affects students' performance using CBT.

The specific objectives of this study are:

1. To examine the relationship between computer anxiety and Computer-Based Test at the Federal University of Technology, Minna.
2. To investigate the relationship between prior computer experience and Computer-Based Test at the Federal University of Technology, Minna.
3. To evaluate the relationship between technical difficulties and Computer-Based Test at the Federal University of Technology, Minna.
4. To determine the relationship between variety of course and Computer-Based Test at the Federal University of Technology, Minna.
5. To identify problems affecting CBT usage in the Federal University of Technology, Minna.

1.3 Research Questions

1. What is the relationship between computer anxiety and Computer-Based Test at the Federal University of Technology, Minna?
2. What is the relationship between prior computer experience and Computer-Based Test at the Federal University of Technology, Minna?
3. What is the relationship between technical difficulties and Computer-Based Test at the Federal University of Technology, Minna?
4. What is the relationship between variety of course and Computer-Based Test at the Federal University of Technology, Minna?
5. What are the problems affecting CBT at the Federal University of Technology, Minna?

1.4 Research Hypotheses

- H1: The mean score responses of the relationship between computer anxiety and computer-based test will be significantly higher than the minimum mean score and they will be accepted.
- H2: The mean score responses of the relationship between prior computer experience and computer-based test will be significantly higher than the minimum mean score and they will be accepted.
- H3: The mean score responses of the relationship between technical difficulties and computer-based test will be significantly higher than the minimum mean score and they will be accepted.
- H4: The mean score responses of the relationship between varieties of course and computer-based test will be significantly higher than the minimum mean score and they will be accepted.
- H5: There are no significant problems associated with computer-based test in the Federal University of Technology, Minna.

2. LITERATURE REVIEW

2.1 Academic Performance

Cambridge University Reporter (2003) defines academic performance with regard to examination performance. Academic accomplishment describes what the students have learned, measured through assessments like tests, performance assessments and portfolio assessments (Santrock, 2006). In the case of the Federal University of Technology (FUT) Minna, grading assessment is divided into two:

- The continuous Assessment; made up of 40 marks.
- Examination; made up of 60 marks.

The students' academic performance is distinguished by different grades which show students' level of performance on each course.

- A (70 – 100)
- B (60 – 69)
- C (54 – 59)
- D (50 – 53)
- E (40 – 45)
- F (0 - 39)

Furthermore, Otu-Danquah (2000) in Otoo (2007) defines academic performance as constituting what a student is capable of achieving when he or she is tested on what he or she has been taught.

2.2 Educational Assessment

Assessment in educational context refers to giving students' assessment test and grading them. This definition is limited; it does not take cognizance of its relevance in the teaching and learning process. Academic evaluation is an essential part to ensure that school achieves its learning goals and most importantly a way of providing the important evidence needed for seeking and maintaining accreditation (Haken, 2006). Hersh (2004) recommended that assigning grades to students to measure learning should be considered an integral process of the learning and teaching in addition to feedback that serves to improve efficiency.

Assessment considered to be good serves multiple objectives (Swearington, n.d.) and some stakeholders gain from it (Love & Cooper, 2004). Educational evaluation provides an effective way of measuring student academic achievement so as educators and school administrators could make effective decisions (Dietal, Herman & Knuth, 1991). As a result, Kellough and Kellough (1999) identified seven purposes of assessment:

- Enhance student knowledge
- Recognizes students' advantages and disadvantages
- Evaluate, and enhance the performance of different teaching strategies
- Evaluate, and enhance the performance of curricular programs
- Enhance teaching performance
- Make available useful information for administrators that encourage decision making
- To interact with stakeholders

2.3 Computer-Based Test and Academic Achievement

Computer-Based Test (CBT) can also be another type of the Paper and Pencil Test (PPT) when conventional PPT is transferred to a computer. But the result obtainable in a computer might not be equivalent to the conventional type.

Though the content of PPT may be the same with that of CBT, its presentation mode might produce a change in assessment-related behaviours, like propensity to guess, and the simplicity and feedback rate (Greud & Green, 1986). Researchers have always argued that cognitive differences could affect students' performance on computers. Duthie (1984) in Wilson, Genco and Yager (1985) proposed that there could be knowledge differences in the way which someone takes computer-based and paper and pencil test respectively. The skills and attitudes or behaviour for using the computer and computer response could affect the cognitive working of the learner. According to Mizokawa and Hamlin (1984), there are procedures for designing and development of electronic based tests, there is little or no data showing impact of electronic test on student academic achievement. Some questions remain unanswered. Example, will technical difficulties affect the performance of the student? Does computer anxiety affect students taking the test? What courses are better with CBT? An important argument associated with electronic assessment is whether result obtained from CBT is the same to PPT.

Computer familiarity and anxiety may indirectly impair students' achievement electronic assessment (Lee, 1986; Llabre, Clements, Fitzhugh, Lancelotta, Mazzagatti, & Quinones, 1987). According to Chin (1990), modifications in assessment structure triggered by cybernation might rearrange items that different abilities would be needed than required for manual format. The author furthermore stated that people who are used to computers would probably have an edge over novices whose test fear is increased when they are faced with a new understanding, skills, or perceptions towards computer systems. Given that computer nervousness could possibly influence one's performance adversely, this variable was found to have aggravated score difference between CBT and PPT (Chin, 1990).

2.4 Computer Experience and Performance

Another issue to be considered is the prior computer experience. The level of computer literacy has been hypothesized to have contributed to performance in CBT. Unfamiliarity, inexperience could also increase the level of anxiety of the test-taker. Therefore it could be said that CBT discriminates among the examinee, giving advantage to those with prior computer skills than others without. Several researches have revealed that one's computer familiarity can affect performance in CBT (Johnson & White, 1980; Lee, 1986). Jimoh, Abduljaleel and Kawu (2012) investigated the opinions of students on the influence of computer familiarity on performance and it found out that a high percentage of students believe that previous computer familiarity influences their performance. Computer familiarity and other factors such as computer anxiety, and computer perspective affect performance in electronic assessment (Chua, Chen & Wong, 1999; Mahar, Henderson & Deane, 1997).

Lee (1986) in Chin (1990) looked into the effectiveness of electronic test of mathematical reasoning with a sample of students. He identified that previous experience with computer was an important aspect influencing students' performance, the study results revealed no factor exist between "low experience" and "high experience" individuals, signifying that little computer experience is adequate for a person to sit for CBT. Essentially, in performance no significant difference among students who had no prior computer knowledge was found. Additionally, studies carried out to look into whether students' previous experience with computer influences their performance as compared to the conventional PPT found the studies contradictory. Findings revealed no connection between lack of computer experience or computer anxiousness or computer nervousness and performance on CBT versus PPT (Wise & Plake, 1989; Wise & Plake, 1990; Mills, 2002; Smith & Caputi, 2004).

2.5 Type of Course and Performance

Previous researches have done little or nothing identifying the type of course as a possible factor affecting CBT. Jimoh, Shittu and Kawu (2012) investigated students' opinion on whether computerized test on chemistry is associated with any problems. The findings of the research reveal that majority of the respondents (54.2%) see no significant difference between problems associated with chemistry electronic test and other courses. While others see problems particular to chemistry course and identify the following:

- Display of hydrocarbons chains.
- Unable to present chemical equations properly.
- Absence of most compound structures
- Erroneous outline of reaction and chemical formulas

For courses like mathematics, where the student is not expected to enter the testing center with calculators or any writing materials, it therefore becomes difficult for examinee to work out his questions before selecting the answers. Most times the examinee finds mathematical formulas difficult to interpret because of the cumbersome nature of displaying it on the computer screen. The above issues points to the fact that the type of the course could also affect students' performance in CBT.

2.6 Technical Difficulties and Performance

Furthermore, researches have shown possible ways psychometric characteristics of tests might alter when the mode of assessment changes. The item-by-mode interaction, where items presented might be altered, others might not, or some might be easier, others might become harder. This is common on assessment with drawings and formulas; the quality of the drawings might appear differently on the computer screen (Green, Bock, Humphreys, Linn & Reckase, 1984). Schenkman (1999) identified different variables play their role on examinee's performance when items are presented on the computer screen. One of the variables is considered to be the monitor's quality. The freezing of computer systems could cause panic and anxiety to the examinee thereby causing cognitive disorder during test-taking. Consequently, the assessment may indirectly evaluate one's computer familiarity together with test course (Chin, 1990).

2.7 Advantages and Disadvantages of CBT

New possibilities regarding advancement in technology for educational evaluation have been opened as a result of technology today, through rich and smart new assessment tasks and potentially powerful scoring, reporting and immediate response mechanisms (Scalise & Gifford, 2006). In order to understand the use of computer-based test in an academic environment, Simin and Heidari (2013) suggested that there are two types of advantages and disadvantages of CBT; Administrative and Pedagogical. According to Simin et al. (2013), administrative advantages are benefits derived at the administration level of implementation while pedagogical are benefits derived at the teaching and learning level. Summarily, the advantages of CBT are as follows:

- Is not at risk of individual malfunction
- Time saving
- Saves cost
- Tutors can flow the progress of learners through constant use of assessment.
- Detailed and specific feedback can be given to learners during and immediately after a test.

While disadvantages are:

- The costly nature involved. Like networking of the systems, training of staff and integration to the school system
- Sometimes the hardware and software used to deliver CBT is not robust as failure becomes unavoidable.

2.8 Methods of Collecting Students Response in CBT

Weeden (2004) in Simin et al. (2013) lists five ways of collecting students answer in a computer-based test:

- Selecting also known as multiple-choices; where test-takers select from a list of choices. Also called the multiple choice objective questions.
- Supplying; where students type in long or short answers and responses. Essay writing is a good example.
- Ordering/ranking; where students order to rank a list of items in a correct or preferred sequence.
- Matching; where test-takers are to identify connections between lists of questions or items.
- Locating; where test-takers identify something from a larger form. For example, given a picture of car, click the bonnet.

The above ways are also methods employed in PPT but with computer-based test video, audio, images and animations can be used together with the test forms. Presently, FUT Minna uses only the multiple-choice responses in its computer-based assessment.

2.9 Overview of Electronic Assessment Technologies

- **Internet**

In modern times, the internet change the way books are distributed. This new technology in the form of e-publishing, the publication of books exclusively online offers a new way of disseminating ideas to the public. The internet allows users to access and transmit variety of files types, document including multimedia. The internet also allows users to transcend times, distance and old technology constraint. The internet is already a major source of breaking news, rivaling such traditional source as newspapers and television.

More importantly, the internet provides services to users such as telnet, FTP, Gopher, internet relay chat, and the web. The relevance of this technology to this study is that it used for transmitting data (questions) to the test takers system. Mostly used for Web-based assessment.

- **World Wide Web (www)**

The World Wide Web is a distributed information system based on hypertext.

The web is often mistaken as synonymous for the internet, the web is just a service that operate on the internet, just like e – mail, telephony ftp etc. WWW is the most powerful and simplest method of providing and retrieving information on the internet.

- **Computer**

An electronic device which is capable of receiving information (data) in a particular form and of performing a sequence of operations in accordance with a predetermined but variable set of procedural instructions (program) to produce a result in the form of information or signals.

- **Network**

A computer network or data network is a telecommunications network which allows computers to exchange data.

3. REVIEW OF EMPIRICAL STUDIES

Five related scholarly works will be reviewed in this part of the work, so as to explore what other researchers have done in relation to this study on assessing computer-based test at the Federal University of Technology, Minna. In a study by Abdulrahman, Balogun and Yahaya (2014), they undertaken to examine the significance of CBT in improving students' academic achievement, its popularity and how it can be improved upon. The study employed a descriptive design as its research methodology, using a questionnaire for data collection.. This is to understand if technology usage has any impact on student's academic performance, and their acceptance of technology to conduct examination. The research findings revealed that there is a significant relationship between computer relationship and the use of technology for examination. The researcher concluded that the findings will assist learning institution to improve the implementation of computer-aided teaching and learning. The relevance of this study to the present study is that both studies focus on the influence of CBT on students' academic performance. While Abdulrahman et al. (2012) focused mainly on find the association between ownership of personal computers and performance in the use of CBT and failed to investigate if others factors affect performance in CBT, the present study therefore aim to fill these vacuums.

Another study by Jimoh, Shittu and Kawu (2012) investigated students' opinions of electronic assessment for chemistry courses. It also assessed the possibilities of using students' opinion for assessment validation. The research used survey method and questionnaire for data collection. To this end, the sample of 48 students was used in this research. Findings show that 95.8% of respondents agree to be comfortable with CBT, 75% say their computer nervousness was low however they have not fully embraced the mode while 29.2% respondents were in total agreement. This study is relevant to this study because it focus on the relationship between computer nervousness and use of CBT. While the study only focuses on the students' perception, the current study will explore their experiences in this context.

Yet another study by Alabi, Issa and Oyekunle (2012) appraises the use of CBT in the conduct of the school post JAMB examinations and other examinations in the school. The study drew attention to the problems associated with the use of PPT, thereby justifying the introduction of CBT. The study recommends holistic adoption of CBT method for the conducting all examinations in the school. This work is important to the current study because of its relationship to CBT. While the former looks at the application, the latter will focus on evaluating its effect on students' academic performance. Further study by Ugwuadu and Joda (2013) was undertaking to determine the influence of computer-based instruction on the academic performance of pre-degree students in Biology course in Modibbo Adama University of Technology, Yola. The study was conducted using quasi-experimental, specifically the non-equivalent control group design. Data collection was done using a Biology Achievement test composed of 50 objective test items. The instrument was both face and content validated and test-retest method was used to estimate the reliability.

The findings show that the students taught with computer-based instruction performed better than those taught with conventional lecture method. The research concluded that computer-based instruction should be used to teach biology because it enhanced students' academic performance. The study was targeted only for computer-based instruction, ours will investigate computer-based test. Finally a study by Jimoh, Yussuff, Akanmu, Enikuomehin and Salman (2013) was carried out to identify factors that can predict adoption of CBT for undergraduate courses. The research was conducted using the survey method and 222 students was the sample population. Three dimensions was used in carrying out the research; Perceived Ease of Use (PEOU), Perceived Usefulness (PU) and Perceived Fairness (PF). The findings of the study show that the three dimensions predicted the adoption of CBT examination mode in the department of Computer Science, University of Ilorin and concluded by recommending that its adoption be considered.

The relevance of this study to the present study is that tries to look at factors that will necessitate CBT adoption to courses. Why the former is limited to computer science courses, the latter will focus generally on all courses.

4. THEORETICAL FRAMEWORK

Since this work is concerned with how CBT affects students' academic performance, The Expectancy - Value Theory and Technology determinism theory was used to appropriately explain the study.

Expectancy – Value Theory: The theory was founded by Martin Fishbein in the 1970s. Expectancy-value advocates believe that human beings are goal-oriented. And that they behave in response to their beliefs and values in order to achieve a desired target. According to expectancy-value theory, "behaviour is a function of the expectancies one has and the value of the goal toward which one is working". The expectancy-value model of achievement motivation also proposes that the overall tendency to achieve in a particular situation depends upon two stable motives—a motive for success and a motive to avoid failure—and the subjective evaluation of the probability of success in the situation. This theory is related to the study noting the fact that the prior aim of any student is high academic performance. Students will expect a high academic performance using CBT when they know that certain behaviours (computer familiarity, lack of computer anxiety and prior computer experience) are needed to achieve the desired goals.

Technology Determinism Theory: According to McQuail (2005), *Technological determinism theory* was propounded by Marshall McLuhan in 1963. Its advocates see technology in general as sole causes of changes in society, and technology is seen as the basic condition for underlying the pattern of social organization. They say that technologies changed society'. In its most extreme form, the entire form of society is seen as being determined by technology: new technologies transform society at every level, including institutions, social interaction and individuals. At the least a wide range of social and cultural phenomena are seen as shaped by technology. In the context of this study, technology determinism is a theory of the relationship between technology (CBT) and Students (academic performance). The technology could be seen to take a life of its own and is seen to a driver a phenomenon, shaping students' academic performance.

5. RESEARCH DESIGN

Research design shows the interaction between the major parts of the research working together to answer the research questions (Trochim, 2006). Sanford and Rebert (1976) states that "A research design is essentially a set of plans for collecting information". It is also a very important empirical method of establishing and validating facts based on observations and data collected. The research will adopt survey method. Survey method was is easier and effective when collecting large data (Mujis, 2004). In addition, Sobowale (2001, p. 45), describes the survey design method as the most flexible means of obtaining infraction. Wimmer and Dominick (2011) enumerated the usefulness of the survey method to include, reduce cost, ease of collection of data from a variety of people and recourse to already existing data. The researcher considered this study to be a field research arising collection of data from actual variables in a quantitative form. Data collected was transformed to numerical data to identify the statistical relationship that exist among them. The study population is the collection of the study unit from which the values of the variable of interest could possibly be determined. It is the total number of observable unit in a given research environment relevant to the research study (Black & Champion, 1976).

The population for this study consists of 16105 undergraduate students of Federal University of Technology (FUT), Minna Niger State for 2014/2015 academic session. This information was obtained from the Information Technology Services (ITS), FUT Minna, Niger State which has the data records of all students in the school. A sample is that part of the study population selected for statistic investigation (Dowinnie & Heath, 1974). With reference to this research work; it is a portion of the entire population pulled out for the study. This study makes use of a sample size of 377 students in FUT Minna. This sample size was drawn using Krejcie and Morgan (1970) table of sample size determination, which establishes sample sizes at 95 percent confidence level and 5 percent sampling error. According to Krejcie and Morgan (1970) table of sample size determination, when a population of study is above 15,000 and less than or equal to 20000, the sample size of population to be used would be 377.

For sufficient representation of various segments of the population, stratified random sampling technique was adopted. This sampling technique, according to Wimmer and Dominick (2008), includes strata with size based on their proportion in the population. This sampling technique is designed to give each person in the population an equal chance of being selected. In the case of this present study, the strata are the schools or faculties. The instrument in the study is a structural questionnaire titled: "Assessment of Computer-Based Test at the Federal University of Technology, Minna". Osuala (2007) describes questionnaire as an instrument that "permits wide coverage for a minimum expense both in money and effort." He further stated that it allows for wider coverage than other techniques, and also reaches individuals who are difficult to contact.

A total of 377 copies of the questionnaire were distributed to the respondents. Each copy of the questionnaire contained two sections (A and B). Section A consisted of 6 items (1 – 6) which characterizes demographic information of the respondents while Section B consisted of 22 items (1 – 22) which probed attitudes of respondents towards the subject matter. The questionnaire was designed using Likert scale format (7 point scale). The response ranged between very strongly disagree (VSD) and very strongly agree (VSA). The researcher went to the location of the study to distribute the copies of the questionnaire on face-to-face basis, assisted by friends. This approach enabled the researcher to be available to clarify the respondents on issues in the questionnaire they (respondents) did not understand and make sure gender and level representation are taking into consideration. The face – to – face approach also guaranteed a high percentage return rate.

Content validity referred to whether the items in the questionnaire were appropriate to measures of the variables under study (Mujis, 2004). The questionnaire passed through content validity. A copy of it was given to the project supervisor, who scrutinized it. Based on the supervisor's advice, the researcher re-worded, re-organized, and added more items to the questionnaire to achieve comprehensibility, simplicity, and versatility. After validation, the questionnaire was administered on 10 students randomly to ascertain its reliability. The researcher employed split-half reliability method to determine how much error is present in the test score. The final result of correlation coefficient obtained is 0.77 which clearly indicates that the questionnaire was reliable for use. After the validation and reliability tests, the researcher administered the questionnaire to the entire population sample on face-to-face basis, assisted by friends in the sampled districts.

The quantitative method of data analysis was adopted in this study. The observations were expressed predominantly in numerical terms and the figures used were accompanied with qualitative description simply because numerical data's cannot stand alone without qualitative description. Data obtained were coded and counted with Statistical Package for Social Sciences (SPSS) and presented in statistical tables. Findings in respect to answering the research questions were analysed using descriptive statistics table. Average mean score was used to answer the research questions and hypothesis with a decision rule of 3.5.

6. FINDINGS AND DISCUSSION

6.1 Data Presentation and Analysis

The data for this study were collected using the questionnaire as an instrument. Based on 377 copies of the questionnaire administered, 351 were retrieved and found usable, yielding 93 percent response rate. Analysis is based on the 351 copies of the questionnaire.

6.2 Demographic Data Analysis

Table 1: Demographic distribution of respondents by Sex

Variable	Frequency	Percentage (%)
Male	241	69
Female	110	31
Total	351	100

Source: Field Survey 2015

The table above indicates the demographic distribution of respondents by age which shows that 241 respondents representing 69 percent were male while 110 respondents representing 31 percent were females.

Table 2: Demographic distribution of respondents by Age

Variable	Frequency	Percentage (%)
16-19	106	30.20
20-25	224	63.82
26-30	21	5.98
31-35	0	0
35 and above	0	0
Total	351	100

Source: Field Survey 2015

From the demographic age distribution table above, 106 respondents representing 30.20 percent falls within the age category of 16-19, 224 respondents representing 63.82 percent were within the age category of 20-25, 21 respondents representing 5.98 percent were within the age category of 26-30, no respondents represented the age category of 31-35 and 35 and above respectively.

Table 3: Demographic distribution of respondents by Level

Variable	Frequency	Percentage (%)
100L	118	33.62
200L	110	31.34
300L	98	27.92
400L	4	1.14
500L	21	5.98
Total	351	100

Source: Field Survey 2015

The demographic distribution of level from the above shows that 118 respondents representing 33.62 percent are in 100L, 110 respondents representing 31.34 percent are in 200L, 98 respondents representing 27.92 percent are in 300L, 4 respondents representing 1.14 percent are in 400L, while 21 respondents representing 5.98 percent are in 500L.

Table 4: Demographic distribution of respondents by marital status

Variable	Frequency	Percentage (%)
Single	342	97.44
Married	9	2.56
Divorced	0	0
Widowed	0	0
Total	351	100

Source: Field Survey 2015

The table above shows that 342 respondents representing 97.44 percent are single while 9 respondents representing 2.56 percent are married.

Table 5: Computer usage without fear

Variable	Frequency	Percentage (%)
Very Strongly Disagree	43	12
Strongly Disagree	13	4
Disagree	9	3
Neutral	13	4
Agree	21	6
Strongly Agree	68	19
Very Strongly Agree	184	52
Total	351	100

Source: Field Survey 2015

Data in Table 5 shows that 43 respondents representing 12 percent very strongly disagree that they can use computers with fear, 13 respondents representing 4 percent strongly disagree that they can use computers with fear, 9 respondents representing 3 percent disagrees that they can use computers with fear, 13 respondents representing 4 percent neither agreed nor disagree that they can use computers with fear, 21 respondents representing 6 percent agrees that they can use computers with fear, 68 respondents representing 19 percent strongly agrees that they can use computers with fear, while 184 respondents representing 52 percent very strongly agrees that they can use computers with fear.

Table 6: Feeling nervous working with computers

Variable	Frequency	Percentage (%)
Very Strongly Disagree	170	49
Strongly Disagree	47	13
Disagree	39	11
Neutral	39	11
Agree	21	6
Strongly Agree	26	7
Very Strongly Agree	9	3
Total	351	100

Source: Field Survey 2015

Data in Table 6 shows that 170 respondents representing 49 percent very strongly disagree that they feel nervous working with computers, 47 respondents representing 13 percent strongly disagree that they feel nervous working with computers, 39 respondents representing 11 percent disagrees that they feel that they feel nervous working with computers, 21 respondents representing 6 percent agrees that they feel nervous working with computers, 26 respondents representing 7 percent strongly agrees that they feel nervous working with computers, while 9 respondents representing 3 percent very strongly agrees that they feel nervous working with computers.

Table 7: Computer-based test makes me feel uneasy and confused

Variable	Frequency	Percentage (%)
Very Strongly Disagree	125	36
Strongly Disagree	63	18
Disagree	38	11
Neutral	46	13
Agree	21	6
Strongly Agree	25	7
Very Strongly Agree	33	9
Total	351	100

Source: Field Survey 2015

Data in Table 7 shows that 125 respondents representing 36 percent very strongly disagree that they CBT makes them feel uneasy and confused, 63 respondents representing 18 percent strongly disagree they CBT makes them feel uneasy and confused, 38 respondents representing 11 percent disagrees that they CBT makes them feel uneasy and confused, 46 respondents representing 13 percent neither agreed nor disagree that they CBT makes them feel uneasy and confused, 21 respondents representing 6 percent agrees that they CBT makes them feel uneasy and confused, 25 respondents representing 7 percent strongly agrees that they CBT makes them feel uneasy and confused, while 33 respondents representing 9 percent very strongly agrees that they CBT makes them feel uneasy and confused.

Table 8: Ability to use computers during test

Variable	Frequency	Percentage (%)
Very Strongly Disagree	34	7
Strongly Disagree	4	2
Disagree	21	6
Neutral	30	9
Agree	68	20
Strongly Agree	76	22
Very Strongly Agree	118	34
Total	351	100

Source: Field Survey 2015

Data in Table 8 shows that 34 respondents representing 7 percent very strongly disagree that they can use computer during test, 4 respondents representing 2 percent strongly disagree they can use computer during test, 21 respondents representing 6 percent disagrees that they can use computer during test, 30 respondents representing 9 percent neither agreed nor disagree that they can use computer during test, 68 respondents representing 20 percent agrees that they can use computer during test, 76 respondents representing 22 percent strongly agrees that they can use computer during test, while 118 respondents representing 34 percent very strongly agrees that they can use computer during test.

Table 9: Confident using computer during test

Variable	Frequency	Percentage (%)
Very Strongly Disagree	39	11
Strongly Disagree	13	4
Disagree	21	6
Neutral	39	11
Agree	43	12
Strongly Agree	77	22
Very Strongly Agree	119	34
Total	351	100

Source: Field Survey 2015

Data in Table 9 shows that 39 respondents representing 11 percent very strongly disagree that they are confident using computer during test, 13 respondents representing 4 percent strongly disagree they are confident using computer during test, 21 respondents representing 6 percent disagrees that they are confident using computer during test, 39 respondents representing 11 percent neither agreed nor disagree that they are confident using computer during test, 43 respondents representing 12 percent agrees that they are confident using computer during test, 77 respondents representing 22 percent strongly agrees that they are confident using computer during test, while 119 respondents representing 34 percent very strongly agrees that they are confident using computer during test.

Table 10: Previous experience with computer affects my performance in CBT

Variable	Frequency	Percentage (%)
Very Strongly Disagree	46	13
Strongly Disagree	17	5
Disagree	13	4
Neutral	8	2
Agree	42	12
Strongly Agree	75	21
Very Strongly Agree	150	43
Total	351	100

Source: Field Survey 2015

Data in Table 10 shows that 46 respondents representing 13 percent very strongly disagree that their previous experience with computers helps when sitting for CBT, 17 respondents representing 5 percent strongly disagree that their previous experience with computers helps when sitting for CBT, 13 respondents representing 4 percent disagrees their previous experience with computers helps when sitting for CBT, 8 respondents representing 2 percent neither agreed nor disagree that their previous experience with computers helps when sitting for CBT, 42 respondents representing 12 percent agrees that their previous experience with computers helps when sitting for CBT, 75 respondents representing 21 percent strongly agrees that their previous experience with computers helps when sitting for CBT, while 150 respondents representing 43 percent very strongly agrees that their previous experience with computers helps when sitting for CBT.

Table 11: My computer crashed during test

Variable	Frequency	Percentage (%)
Very Strongly Disagree	98	28
Strongly Disagree	29	8
Disagree	49	14
Neutral	40	11
Agree	53	15
Strongly Agree	27	7
Very Strongly Agree	62	17
Total	351	100

Source: Field Survey 2015

Data in Table 11 shows that 98 respondents representing 28 percent very strongly disagree that they have experienced their computer crashed during test, 29 respondents representing 8 percent strongly disagree that their they have experienced their computer crashed during test, 49 respondents representing 14 percent disagrees that they have experienced their computer crashed during test, 40 respondents representing 11 percent neither agreed nor disagree they have experienced their computer crashed during test, 53 respondents representing 15 percent agrees that they have experienced their computer crashed during test, 27 respondents representing 7 percent strongly agrees that they have experienced their computer crashed during test, while 62 respondents representing 17 percent very strongly agrees that they have experienced their computer crashed during test.

Table 12: Difficulty launching system calculator

Variable	Frequency	Percentage (%)
Very Strongly Disagree	76	22
Strongly Disagree	18	5
Disagree	36	10
Neutral	27	8
Agree	44	13
Strongly Agree	40	11
Very Strongly Agree	110	31
Total	351	100

Source: Field Survey 2015

Data in Table 12 shows that 76 respondents representing 22 percent very strongly disagree that they have experienced difficulty launching the system calculator, 18 respondents representing 5 percent strongly disagree that their they have experienced difficulty launching the system calculator, 36 respondents representing 10 percent disagrees that they have experienced difficulty launching the system calculator, 27 respondents representing 8 percent neither agreed nor disagree they have experienced difficulty launching the system calculator, 44 respondents representing 13 percent agrees that they have experienced difficulty launching the system calculator, 40 respondents representing 11 percent strongly agrees that they have experienced difficulty launching the system calculator, while 110 respondents representing 31 percent very strongly agrees that they have experienced their difficulty launching the system calculator.

Table 13: Chemical/Mathematical expressions unable to display properly

Variable	Frequency	Percentage (%)
Very Strongly Disagree	44	13
Strongly Disagree	18	5
Disagree	31	9
Neutral	31	9
Agree	49	14
Strongly Agree	40	11
Very Strongly Agree	138	39
Total	351	100

Source: Field Survey 2015

Data in Table 13 shows that 44 respondents representing 13 percent very strongly disagree that they have experienced chemical/mathematical expressions unable to display properly on computer screen, 18 respondents representing 5 percent strongly disagree that they have experienced chemical/mathematical expressions unable to display properly on computer screen, 31 respondents representing 9 percent disagree that they have experienced chemical/mathematical expressions unable to display properly on computer screen, 31 respondents representing 9 percent neither agreed nor disagree they have experienced chemical/mathematical expressions unable to display properly on computer screen, 49 respondents representing 14 percent agree that they have experienced chemical/mathematical expressions unable to display properly on computer screen, 40 respondents representing 11 percent strongly agree that they have experienced chemical/mathematical expressions unable to display properly on computer screen, while 138 respondents representing 39 percent very strongly agree that they have experienced chemical/mathematical expressions unable to display properly on computer screen.

Table 14: Freezing of computers during test

Variable	Frequency	Percentage (%)
Very Strongly Disagree	50	14
Strongly Disagree	36	10
Disagree	18	5
Neutral	18	5
Agree	63	18
Strongly Agree	95	27
Very Strongly Agree	71	21
Total	351	100

Source: Field Survey 2015

Data in Table 14 shows that 50 respondents representing 14 percent very strongly disagree that they have experienced their computer system freeze during test, 36 respondents representing 10 percent strongly disagree that they have experienced their computer system freeze during test, 18 respondents representing 5 percent disagree that they have experienced their computer system freeze during test, 18 respondents representing 5 percent neither agreed nor disagree they have experienced their computer system freeze during test, 63 respondents representing 18 percent agree that they have experienced their computer system freeze during test, 95 respondents representing 27 percent strongly agree that they have experienced their computer system freeze during test, while 71 respondents representing 21 percent very strongly agree that they have experienced their computer system freeze during test.

Table 15: Difficulty submitting test

Variable	Frequency	Percentage (%)
Very Strongly Disagree	89	25
Strongly Disagree	42	12
Disagree	42	12
Neutral	47	13
Agree	34	10
Strongly Agree	42	12
Very Strongly Agree	55	16
Total	351	100

Source: Field Survey 2015

Data in Table 15 shows that 89 respondents representing 25 percent very strongly disagree that they have experienced difficulty submitting their test, 42 respondents representing 12 percent strongly disagree that they have experienced difficulty submitting their test, 42 respondents representing 12 percent disagrees that they have experienced difficulty submitting their test, 47 respondents representing 13 percent neither agreed nor disagree they have experienced difficulty submitting their test, 34 respondents representing 10 percent agrees that they have experienced difficulties submitting their test, 42 respondents representing 12 percent strongly agrees that they have experienced difficulty submitting their test, while 55 respondents representing 16 percent very strongly agrees that they have experienced difficulty submitting their test.

Table 16: Technical difficulties affect my performance in CBT

Variable	Frequency	Percentage (%)
Very Strongly Disagree	20	6
Strongly Disagree	45	13
Disagree	31	9
Neutral	19	6
Agree	34	10
Strongly Agree	103	29
Very Strongly Agree	99	28
Total	351	100

Source: Field Survey 2015

Data in Table 16 shows that 20 respondents representing 6 percent very strongly disagree that technical difficulties affect their performance in CBT, 45 respondents representing 13 percent strongly disagree that technical difficulties affect their performance in CBT, 31 respondents representing 9 percent disagrees that technical difficulties affect their performance in CBT, 19 respondents representing 6 percent neither agreed nor disagree that technical difficulties affect their performance in CBT, 34 respondents representing 10 percent agrees that technical difficulties affect their performance in CBT, 103 respondents representing 29 percent strongly agrees that technical difficulties affect their performance in CBT, while 99 respondents representing 28 percent very strongly agrees that technical difficulties affect their performance in CBT.

Table 17: Insufficient time allotted to calculation related test

Variable	Frequency	Percentage (%)
Very Strongly Disagree	38	11
Strongly Disagree	4	1
Disagree	4	1
Neutral	13	4
Agree	55	16
Strongly Agree	25	7
Very Strongly Agree	212	60
Total	351	100

Source: Field Survey 2015

Data in Table 17 shows that 38 respondents representing 11 percent very strongly disagree that the time allotted for calculation-related tests are not enough, 4 respondents representing 1 percent strongly disagree that the time allotted for calculation-related tests are not enough, 4 respondents representing 1 percent disagrees that the time allotted for calculation-related tests are not enough, 13 respondents representing 4 percent neither agreed nor disagree that the time allotted for calculation-related tests are not enough, 55 respondents representing 16 percent agrees that the time allotted for calculation-related tests are not enough, 25 respondents representing 7 percent strongly agrees that the time allotted for calculation-related tests are not enough, while 212 respondents representing 60 percent very strongly agrees that the time allotted for calculation-related tests are not enough.

Table 18: Some courses need essay in CBT

Variable	Frequency	Percentage (%)
Very Strongly Disagree	64	18
Strongly Disagree	26	7
Disagree	34	10
Neutral	39	11
Agree	60	17
Strongly Agree	56	16
Very Strongly Agree	72	21
Total	351	100

Source: Field Survey 2015

Data in Table 18 shows that 64 respondents representing 18 percent very strongly disagree that some courses do not need only multiple choice questions but also essay, 26 respondents representing 7 percent strongly disagree that some courses do not need only multiple choice questions but also essay, 34 respondents representing 10 percent disagrees that some courses do not need only multiple choice questions but also essay, 39 respondents representing 11 percent neither agreed nor disagree that some courses do not need only multiple choice questions but also essay, 60 respondents representing 17 percent agrees that some courses do not need only multiple choice questions but also essay, 56 respondents representing 16 percent strongly agrees that some courses do not need only multiple choice questions but also essay, while 72 respondents representing 21 percent very strongly agrees that some courses do not need only multiple choice questions but also essay.

Table 19: Calculation-related test need workspace

Variable	Frequency	Percentage (%)
Very Strongly Disagree	37	11
Strongly Disagree	33	9
Disagree	14	4
Neutral	24	7
Agree	81	23
Strongly Agree	62	18
Very Strongly Agree	100	28
Total	351	100

Source: Field Survey 2015

Data in Table 19 shows that 37 respondents representing 11 percent very strongly disagree that students should be provided with workspace for calculation-related courses, 33 respondents representing 9 percent strongly disagree that students should be provided with workspace for calculation-related courses, 14 respondents representing 4 percent disagrees that students should be provided with workspace for calculation-related courses, 24 respondents representing 7 percent neither agreed nor disagreed that students should be provided with workspace for calculation-related courses, 81 respondents representing 23 percent agrees that students should be provided with workspace for calculation-related courses, 62 respondents representing 18 percent strongly agrees that students should be provided with workspace for calculation-related courses, while 100 respondents representing 28 percent very strongly agrees that students should be provided with workspace for calculation-related courses.

Table 20: All courses should be made suitable for CBT

Variable	Frequency	Percentage (%)
Very Strongly Disagree	83	24
Strongly Disagree	8	2
Disagree	29	8
Neutral	50	14
Agree	29	8
Strongly Agree	45	13
Very Strongly Agree	107	31
Total	351	100

Data in Table 20 shows that 83 respondents representing 24 percent very strongly disagree that all courses should be suitable for CBT, 8 respondents representing 2 percent strongly disagree that they all courses should be suitable for CBT, 29 respondents representing 8 percent disagrees that all courses should be suitable for CBT, 50 respondents representing 14 percent neither agreed nor disagreed that all courses should be suitable for CBT, 29 respondents representing 8 percent agrees that all courses should be suitable for CBT, 45 respondents representing 13 percent strongly agrees that all courses should be suitable for CBT, while 107 respondents representing 31 percent very strongly agrees that all courses should be suitable for CBT.

Table 21: Type of course affects my performance in CBT

Variable	Frequency	Percentage (%)
Very Strongly Disagree	125	36
Strongly Disagree	31	9
Disagree	24	7
Neutral	20	6
Agree	21	6
Strongly Agree	40	11
Very Strongly Agree	90	25
Total	351	100

Source: Field Survey 2015

Data in Table 21 shows that 125 respondents representing 36 percent very strongly disagree that the type of course affects their performance in CBT, 31 respondents representing 9 percent strongly disagree that the type of course affects their performance in CBT, 24 respondents representing 7 percent disagrees that the type of course affects their performance in CBT, 20 respondents representing 6 percent neither agreed nor disagreed that the type of course affects their performance in CBT, 21 respondents representing 6 percent agrees that the type of course affects their performance in CBT, 40 respondents representing 11 percent strongly agrees that the type of course affects their performance in CBT, while 90 respondents representing 25 percent very strongly agrees the type of course affects their performance in CBT.

Table 22: Students find it easier to impersonate

Variable	Frequency	Percentage (%)
Very Strongly Disagree	81	23
Strongly Disagree	30	9
Disagree	56	16
Neutral	73	21
Agree	47	13
Strongly Agree	17	5
Very Strongly Agree	47	13
Total	351	100

Source: Field Survey 2015

Data in Table 22 shows that 81 respondents representing 23 percent very strongly disagree that students find it easier to impersonate, 30 respondents representing 9 percent strongly disagree that students find it easier to impersonate, 56 respondents representing 16 percent disagrees that students find it easier to impersonate, 73 respondents representing 21 percent neither agreed nor disagreed that students find it easier to impersonate, 47 respondents representing 13 percent agrees that students find it easier to impersonate, 17 respondents representing 5 percent strongly agrees that students find it easier to impersonate, while 47 respondents representing 13 percent very strongly agrees that students find it easier to impersonate.

Table 23: Test results are not authentic, reliable and accurate

Variable	Frequency	Percentage (%)
Very Strongly Disagree	25	7
Strongly Disagree	13	4
Disagree	30	9
Neutral	42	12
Agree	72	20
Strongly Agree	30	9
Very Strongly Agree	139	39
Total	351	100

Source: Field Survey 2015

Data in Table 23 shows that 25 respondents representing 7 percent very strongly disagree that CBT results are not authentic, reliable and accurate, 13 respondents representing 4 percent strongly disagree that CBT results are not authentic, reliable and accurate, 30 respondents representing 9 percent disagrees that CBT results are not authentic, reliable and accurate, 42 respondents representing 12 percent neither agreed nor disagreed that CBT results are not authentic, reliable and accurate, 72 respondents representing 20 percent agrees that CBT results are not authentic, reliable and accurate, 30 respondents representing 9 percent strongly agrees that CBT results are not authentic, reliable and accurate, while 139 respondents representing 39 percent very strongly agrees that CBT results are not authentic, reliable and accurate.

Table 24: Some questions do not have answers as part of its options

Variable	Frequency	Percentage (%)
Very Strongly Disagree	35	10
Strongly Disagree	30	9
Disagree	30	9
Neutral	61	17
Agree	56	16
Strongly Agree	43	12
Very Strongly Agree	96	27
Total	351	100

Source: Field Survey 2015

Data in Table 24 shows that 35 respondents representing 10 percent very strongly disagree that some questions do not have their answers as part of its options, 30 respondents representing 9 percent strongly disagree that some questions do not have their answers as part of its options, 30 respondents representing 9 percent disagrees that some questions do not have their answers as part of its options, 61 respondents representing 17 percent neither agreed nor disagreed that some questions do not have their answers as part of its options, 56 respondents representing 16 percent agrees that some questions do not have their answers as part of its options, 43 respondents representing 12 percent strongly agrees that some questions do not have their answers as part of its options, while 96 respondents representing 27 percent very strongly agrees that some questions do not have their answers as part of its options.

Table 25: CBT should be written promptly as scheduled

Variable	Frequency	Percentage (%)
Very Strongly Disagree	22	6
Strongly Disagree	13	4
Disagree	13	4
Neutral	22	6
Agree	70	20
Strongly Agree	48	14
Very Strongly Agree	163	46
Total	351	100

Source: Field Survey 2015

Data in Table 25 shows that 22 respondents representing 6 percent very strongly disagree that CBT should be written promptly as scheduled, 13 respondents representing 4 percent strongly disagree that CBT should be written promptly as scheduled, 13 respondents representing 4 percent disagrees that CBT should be written promptly as scheduled, 22 respondents representing 6 percent neither agreed nor disagreed that CBT should be written promptly as scheduled, 70 respondents representing 20 percent agrees that CBT should be written promptly as scheduled, 48 respondents representing 14 percent strongly agrees that CBT should be written promptly as scheduled, while 163 respondents representing 46 percent very strongly agrees that CBT should be written promptly as scheduled.

Table 26: Students find easier to lobby CBT staff

Variable	Frequency	Percentage (%)
Very Strongly Disagree	47	13
Strongly Disagree	37	11
Disagree	26	7
Neutral	63	18
Agree	52	15
Strongly Agree	42	12
Very Strongly Agree	84	24
Total	351	100

Source: Field Survey 2015

Data in Table 26 shows that 47 respondents representing 13 percent very strongly disagree that students find it easier to lobby CBT staff to upgrade their result, 37 respondents representing 11 percent strongly disagree that students find it easier to lobby CBT staff to upgrade their result, 26 respondents representing 7 percent disagrees that students find it easier to lobby CBT staff to upgrade their result, 63 respondents representing 18 percent neither agreed nor disagreed that students find it easier to lobby CBT staff to upgrade their result, 52 respondents representing 15 percent agrees that students find it easier to lobby CBT staff to upgrade their result, 42 respondents representing 12 percent strongly agrees that students find it easier to lobby CBT staff to upgrade their result, while 84 respondents representing 24 percent very strongly agrees that students find it easier to lobby CBT staff to upgrade their result.

7. DISCUSSIONS

This section discusses the findings of the study. It answers to research questions and hypothesis raised in the study.

Research Question One:

What is the relationship between computer anxiety and Computer-Based Test at the Federal University of Technology, Minna?

Hypothesis 1: The mean score responses of the relationship between computer anxiety and computer-based test will be significantly higher than the minimum mean score and they will be accepted. Table five, six, seven, eight, nine of this chapter answered research question one. Responses in Table 4.5 indicate that 184 respondents representing 52 percent very strongly agree that they can use computers without fear, responses in Table 4.6 indicate that majority of the respondents (170) representing 49 percent very strongly disagree that they feel nervous working with computers, responses in Table 4.7 indicate that majority of the respondents (125) representing 36 percent very strongly disagree that CBT makes them feel uneasy and confused, responses in Table 4.8 indicate that majority of the respondents (118) representing 34 percent very strongly agree that they can use computers during the test, responses in Table 4.9 indicate that majority of the respondents (119) representing 34 percent very strongly agree that they feel confident using computers during test.

Therefore, the hypothesis was accepted because the mean score responses of the relationship between computer anxiety and computer-based test were significantly higher than the minimum mean score. The findings in this study is in agreement with the findings of Smith and Caputi (2004) which reported that there was no connection between lack of computer anxiousness and performance on CBT.

Research Question Two:

What is the relationship between prior computer experience and Computer-Based Test at the Federal University of Technology, Minna?

Hypothesis 2: The mean score responses of the relationship between prior computer experience and computer-based test will be significantly higher than the minimum mean score and they will be accepted.

Table 4.10 indicate that majority of the respondents (150) representing 43 percent very strongly agree that their previous experience with computers helped them during test. The findings show that majority of the respondents believe that their prior computer experience affects their performance during test. Therefore, the hypothesis was accepted because the mean score responses on the relationship between prior computer experience and computer-based test were significantly higher than the minimum mean score. These findings therefore corroborate Jimoh, Abduljaleel and Kawu (2012) findings which investigated opinions of students on the influence of computer familiarity on performance where it was found out that a high percentage of students believed that previous computer familiarity influences their performance.

Research Question Three:

What is the relationship between technical difficulties and Computer-Based Test at the Federal University of Technology, Minna?

Hypothesis 3: The mean score responses of the relationship between technical difficulties and computer-based test will be significantly higher than the minimum mean score and they will be accepted.

Table 4.27: Students' view on technical difficulties

	Mean	Decision (3.5)	Rule	Rank
I believe I have experienced my computer crash	3.73	Accepted		5 th
I believe I find it difficult to launch the system calculator	4.44	Accepted		4 th
I believe I have experienced chemical/mathematical expressions unable to display properly	4.98	Accepted		2 nd
I believe that I have experienced my computer freeze in the course of test	4.64	Accepted		3 rd
I believe I have experienced difficulty in submitting my test	3.69	Accepted		6 th
I believe that these technical difficulties affect my performance in CBT	5.01	Accepted		1 st

Source: Field Survey 2015

Table 4.27 shows the evaluation items on technical difficulties. The agreeability mean of respondents is high at 4.42. Most students agree that technical difficulties after their performance in CBT with a mean score of 5.01. The table also indicates that most students have experienced chemical/mathematical expressions unable to display properly. It is ranked second with a mean of 3.73. With a mean score of 4.64, respondents have experienced computer freeze in the course of test. Ranked next is that respondents find it difficult to launch the system calculator with a mean score of 4.44. Respondents who have experienced their computer crash are ranked next with a mean score of 3.73. Respondents that experienced difficulty in submitting is least ranked with a mean score of 3.69. The agreeability mean score which is the average mean score of all items shows that there is a relationship between technical difficulties and performance in CBT.

Therefore, the hypothesis was accepted because the mean score responses on the relationship between technical difficulties and computer-based test were significantly higher than the minimum mean score. The findings in this study confirm Chin (1990) study on CBT which found out that there was a positive relationship between technical difficulties and mode of assessment.

Research Question Four:

What is the relationship between variety of courses and Computer-Based Test at the Federal University of Technology, Minna?

Hypothesis 4: The mean score responses of the relationship between variety of courses and computer-based test will be significantly higher than the minimum mean score and they will be accepted.

Data from Table 4.28 (below) indicates that from the respondents view that the time allotted for mathematical related test is not enough with a mean score of 5.75. Respondents agreed that calculation-related test need workspace with a mean score of 4.89. Ranked next is respondents that agree that all courses should be made suitable for CBT, this agreement is with a mean score of 4.42. Respondents also admitted that some courses don't only need multiple choice questions but also essay with a mean score of 4.31. While the mean score of those that agree that type of course affects them was the lowest with 3.74. The agreeability mean score is 4.62 which is partly high. This implies that respondents believe that type of course affects their performance in CBT. Therefore, the hypothesis was accepted because the mean score responses on the relationship between variety of course and computer-based test were significantly higher than the minimum mean score.

Table 4.28: Students' view on variety of courses

	Mean	Decision (3.5)	Rule	Rank
I believe the time allotted for my mathematical/calculation-related test are not enough	5.75	Accepted		1 st
I believe some courses don't need only multiple choice questions but also essay	4.31	Accepted		4 th
I believe some calculation-related test need workspace	4.89	Accepted		2 nd
I believe all courses should be made suitable for CBT	4.42	Accepted		3 rd
I believe that type of course affects my performance in CBT	3.74	Accepted		5 th

Source: Field Survey 2015

Research Question Five:

What are problems affecting computer-based test at the Federal University of Technology, Minna?

Hypothesis 5: There are no significant problems associated with computer-based test at the Federal University of Technology, Minna.

The essence of this research question is to rank students' attitudes, perceptions towards problems that could affect CBT in Federal University of Technology, Minna. To answer this question, respondents were presented with the above items in the Likert scale question. The result in Table 4.29 (below) shows that respondents agreed that CBT should be written promptly as scheduled with a mean score of 5.57. Ranked second is respondents view that results of the test are not authentic, reliable and accurate with a mean score 5.19. Students agreed that some questions don't have their answers as part of the options is next with a mean score 4.67. With a mean score 4.42, respondents believe that students can easily lobby CBT staff to upgrade their result. Respondents mildly agree that students find it easier to impersonate with a mean score of 3.61. The agreeability mean score of 4.69 shows that students agree that the problems could affect CBT in Federal University of Technology, Minna. Therefore, the hypothesis was rejected because there were significant problems associated with computer-based test at the Federal University of Technology, Minna.

Table 4.29: Students' view on problems affecting CBT

	Mean	Decision (3.5)	Rule	Rank
I believe students find it easier to impersonate	3.61	Accepted		5 th
I believe the results of the test are not authentic, reliable and accurate	5.19	Accepted		2 nd
I believe some questions don't have their answers as part of the options	4.67	Accepted		3 rd
I believe that CBT should be written promptly as scheduled	5.57	Accepted		1 st
I believe students can easily lobby CBT staff to upgrade their result	4.42	Accepted		4 th

Source: Field Survey 2015

8. CONCLUSION

This study assessed Computer-Based Test (CBT) at the Federal University of Technology, Minna. Five research questions were formulated to achieve the objectives. Findings showed that most respondents do not get anxious using computer for their assessment, while the majority of respondents agree that their previous computer experience affects their performance in CBT. Also, to large extent respondents agree that technical difficulties affect performance in CBT and the majority of the respondents admitted that type of courses affects performance in CBT. Finally, respondents agree that CBT should be written as promptly scheduled, test results are not authentic, reliable and accurate, some questions do not have answer as their option, students can easily lobby CBT staff to upgrade their results and students can easily impersonate.

In conclusion, the findings of this study, it is significant to conclude here that the identified factors like technical difficulties and type of courses (calculation-based) are problems associated with CBT in FUT Minna. Findings in this study also revealed majority of students are not computer anxious. It can be concluded that the assessment of computer-based test at the FUT Minna is not without its own hiccup as there are problems associated with it.

9. RECOMMENDATIONS

Based on the findings of this study, the following recommendations are made:

1. The school management should endeavour to embed calculator to the CBT program, this is to allow students easily use the calculator.
2. Immediate display of test score should be implemented; this is to raise the transparency level of the test process.
3. The school management should encourage use of computers to write essay tests.
4. More time should be allotted to calculation-related courses.
5. Test scores should be in discretion of lecturers alone.
6. To achieve the above recommendation, CBT questions should be encrypted directly from the lecturer and will be decrypted only when the student that registered the course logs in to take the test.
7. Maintenance of the computers should be done regularly to avoid freezing, and crashing of systems during test.

10. FUTURE WORK

This study was conducted on undergraduates at the Federal University of Technology. The direction of the future work should be carrying out similar study on other tertiary institutions that use CBT. This will help in strengthening the generalizability if such findings are consistent with findings from this study.

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