ASSESSMENT OF STUDENTS' PERCEPTION OF JOINT ADMISSION AND MATRICULATION BOARD COMPUTER BASED EXAMINATION IN NNAMDI AZIKIWE UNIVERSITY AWKA, ANAMBRA STATE, NIGERIA

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A DISSERTATION SUBMITTED TO THE SCHOOL OF POSTGRADUATE STUDIES, AHMADU BELLO UNIVERSITY, IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF MASTER DEGREE IN INSTRUCTIONAL TECHNOLOGY, DEPARTMENT OF EDUCATIONAL FOUNDATIONS AND CURRICULUM
FACULTY OF EDUCATION, AHMADU BELLO UNIVERSITY,
ZARIA NIGERIA

JULY, 2016

DECLARATION

I hereby declare that the work in this dissertation entitled "Assessment of Students' Perception of Joint Admission and Matriculation Board Computer Based Examination in Nnamdi Azikiwe University Awka, Anambra State, Nigeria'' has been performed by me in the Department of Educational Foundations and Curriculum. The information derived from the literature has been duly acknowledged in the text and a list of references provided. No part of this dissertation was previously presented for another degree or diploma at this or any other Institution.

Emeka Innocent Anene _____ _____

Signature Date

CERTIFICATION

This Dissertation title ‘ ASSESSMENT OF STUDENTS’ PERCEPTION OF JOINT ADMISSION AND MATRICULATION BOARD COMPUTER BASED EXAMINATION IN NNAMDI AZIKIWE UNIVERSITY, AWKA, ANAMBRA STATE, NIGERIA” was carried out by Emeka Innocent ANENE, meets the regulations governing the award of Master of Education in Instructional Technology, Ahmadu Bello University, Zaria and is approved for its contribution to knowledge and literary presentation.

Prof. M. Abdullahi Chairman Supervisory Committee	_____ Signature	_____ Date
Dr. S.A. Zubairu Member, Supervisory Committee	_____ Signature	_____ Date
Prof. B. Maina Head of Department	_____ Signature	_____ Date
Prof. K. Bala Dean, School of Postgraduate Studies	_____ Signature	_____ Date

DEDICATION

To my parents, Mr. and Mrs. Charles Anene for setting the standard I strive for in life.

ACKNOWLEDGEMENTS

I wish to give honour and glory to God Almighty for his guidance, protection and divine wisdom for the successfully completion of my masters degree programme. My sincere gratitude goes to considerable number of persons for successful completion of this study. I wish to show appreciation and thank the faculty members, especially the Department of Educational Foundations and Curriculum to which this research thesis primarily belong to, friends and family members who made my higher academic endeavor a reality.

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I also want to thank my one and only Aunt Mrs. Ifeyinwa Christopher who contributed immensely to my career. My thanks to Mujitaba Saidu Baure who helped me to discover this University. May the Almighty God guide and protect you all. I want to thank the Academic planning unit of Nnamdi Azikiwe University, Awka and students who assisted me in one way or the other. I am obliged to the Head of Department Dr. Bashir Maina and all my lecturers for their encouragement. Finally, I am most grateful to the entire management of Ahmadu Bello University, Zaria.

ABSTRACT

This study focused on the "Assessment of student's perception of Joint Admission and Matriculation Board computer based examination in Nnamdi Azikiwe University, Awka, Anambra state, Nigeria. The study had five objectives; five research questions and three hypotheses. Relevant literatures to the study were reviewed and all cited authorities were dully acknowledged at the reference. Ex- fact research design was used to conduct the study. The target population of this study was 972 students, which comprise of first year undergraduate students of 2014/2015 session in the faculty of education, Nnamdi Azikiwe University. Sample size of 274 students' was selected using simple random sampling technique with Krijcie and Morgan (1970). A structured four modified likert scale questionnaire were adopted and content validity was used to validate the instrument. A pilot study was conducted on 10 students in the faculty of engineering. It gave reliability co-efficient (r) of 0.787 for section B, while C is 0.797 and D was 0.864 alpha using crobanch alpha statistics. Questionnaires were personally distributed by the researcher and only 272 questionnaires were returned representing 99.1% of the 274 questionnaire administered. The mean and standard deviation was used to answer the research questions and Mann Whitney test was used to test hypotheses one, while the Kruskal Wallis test was used to test hypotheses two and three at $p \leq 0.05$ level of significance. The study revealed that students general perceived Joint Admission and Matriculation Board computer based examination is that computer based examination was a concrete and rewarding experience and also computer based examination as enjoyable than paper based examination. The study also revealed that poor computer literacy affect students' perception on computer based examination and lack of a well designed examination instruction on the use of computer based examination. Based on these findings it was concluded that the management of Joint Admission and Matriculation Board should take into cognizance the perception of students towards computer based examination for full operational of the innovative techniques in Nigeria. It was recommended that students should be encouraged to improve their computer literacy so as to enhance their flexibility during the Joint Admission and Matriculation Board computer based examination. The Federal Ministry of Education should totally eradicate the use of paper pencil examination to pave way for full implementation of computer based examination in Nigeria in order to meet up with the world best practices.

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LIST OF ABBREVIATION

CBE: Computer Based Examination

CAI: Computer Assisted Instruction

CMI: Computer Managed Instruction

DF: Degree of Freedom

FME: Federal Ministry of Education

JAMB: Joint Admission and Matriculation Board

ICT: Information and Communication Technology

NAU: Nnamdi Azikiwe University

UNESCO: United Nation Educational Scientific and Cultural Organization

OPERATIONAL DEFINITION OF TERMS

Perception: - is the process of recognizing and interpreting sensory stimuli.

Computer based examination: - electronic means for assessing students' academic performance in formative and summative assessment in digitalized environment or classroom.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Information and communication technology is presently perceived as a propelling force in attaining global economic development. Nwagwu (2006) states that the rapid rate at which information and communication technologies has evolved since the mid 20th century, the convergence and pervasiveness of information and communication technologies give them a strong role in development and globalization. It equally refers to a definite knowledge acquired or supported about something or somebody or collected facts and data about a specific subject. Obiekezie and Onyema (2000) opine that communication is the process of transferring ideas, skills or aptitudes from one person to another accurately and satisfactorily.

Okoye (2005) perceives information and communication technology as the use of electronic means to collect data, process, store, retrieve and make available different types of messages to people around the world. McGorry (2002) postulated that information and communication technology has the potential to remove the barriers that are causing the problems of low rate of education in any country; it can be used as a tool to overcome time and distance barriers. The field of education has been affected by information and communication technology which have undoubtedly affected teaching, learning and research, (Yusuf, 2005). Education is the driving force of economic and social development in any society, it is necessary to find ways to make education of good

quality, accessible, and affordable to all, using the latest technology available to propel the national educational system to greater level with cutting edge technologies.

Ocho (2005) perceives education as the transmission of what is desirable to individuals to make them knowledgeable and contributing members of the society. The great innovations in our entire life influence directly or indirectly the systems that control our knowledge, skills and behavior. The evolution of our culture is one of the major indicators for this change. Assessment as a part of the educational system is exposed to the same changes. According to Uysal and Kuzu (2009) the rapid advancement of information and communication technologies in teaching and learning has shifted the paradigm from paper-pencil based to computer based system of examination to minimize examination malpractice and grade students automatically. Sadiq and Onianwa (2011) are of the view that it is becoming commonplace to see institutions across educational strata adopt computer based examination and assessment to admit or screen students for entrance examination into higher institutions in Nigeria. This is a relatively new phenomenon in Nigeria for conducting examination at all levels of our educational sector.

Using computers to assist assessment task has been an interesting research topic for decades for educational researchers across the globe. Whittington, Bull, and Damson, (2000) believe Computer based examination is the form of assessment in which the computer is an integral part of question ‘’paper’’ delivery, response storage, marking of response or reporting of results from a test or exercise (examination). Conole and Warburton (2005) is of the view computer aided assessment for assessing students learning, learning is no more divided; there is no more digital separation between school

environment and work place experience. This is because students are exposed to computer knowledge and the use of internet facilities in teaching and learning has bridged the gap between the school and the world at large.

The term, computer based examination which is usually called computer assisted testing, computer aided assessment, computer based assessment, online assessment, web based assessment and e-assessment are such activities which includes the designing and delivery of assessment, markings by computers or humans assisted by scanners, educational software and online tools and all processes of reporting, storing and transferring of data associated with public and internal assessments. Computer based examination is an end to end electronic assessment process where information and communication technology is used for presentation of assessment activity and the recording of responses as well as evaluating results. Joint Information Systems Committee / Qualification and Curriculum Authority (2008) this includes the end to end assessment process from the perspective of learners, tutors, facilitators, learning bodies/establishment, test organization/companies, degree awarding bodies and regulators and the general public.

Davey (2011) noted that a wide assortment of options are now available for using a computer to present information, facilitate interaction and collect responses in ways not possible with traditional examination based items. Assessment is central to the practice of education. If education is the life wire of every society; assessment should be the life wire of education. For student's good performance, understanding and perception on high stake assessment gives access to further educational opportunities and employment for teachers

and schools; as it provides evidence of success as individual and institutions. According to Jim and Sean (2006) assessment systems provide the ways to measure individual and institutional success and so can have profound driving influence on systems they were designed to serve.

However, in an early study of computer based examination and paper pencil examination versions of Graduate Record Examination (GRE) Parshall and Kromrey (1993) found out that examinee's gender, race, qualification and age were associated with the test mode although the results varied across the three sub-scales (verbal, quantitative and analytic) of the Graduate Record Examination. Becker (2006) questioned "digital equity" in computer access, computer use, and age and state-level technology policies when considering digitalized examination. In a related view, Haertel (1999) argues that these tests not only show how students to learn, but also, students show higher engagement in the learning process irrespective of individual age of the student in higher institution, this is as result of the influence information and communication technologies in education and human life have bridge the age use of computerized/network tool among learners. Deco and Crawford (2008) asserted that academic performance is the process of measuring the student's auxiliary behavior which must be acquired at the lower level of the learning structure and terminal performance during and at the end of instruction. Ayo, Akinyemi, Adebiyi, and Ekong (2007) also see e- examination as a system that involves the conduct of examination through the web or the intranet.

Elemary and Abu (2006), state that schools, examination bodies and agencies around the world establish connection to the internet and teacher and students gain

proficiency with navigating through the vast quantity of readily available information. The web can be a dynamic tool capable of assisting educators in propelling learning, exiting and competing levels and of bringing education and examination or assessment to any student anywhere at any time. One of the potentials of the computer web or internet connectivity is the ability to conduct examination through electronic means; students can be assessed at their own place in e- classroom. Awosiyan (2010) quoting Olu Jegede, former Vice-chancellor of NOUN, says that e-examination was introduced to address series of anomalies being encountered in the manual tests. He said that the e-examination would remove all human errors recorded in manual examination and create opportunity for students to access their results immediately.

Technology adoption model is one of the well known models related to technology acceptance and use is the technology acceptance model originally proposed by Davis in 1986. TAM has proven to be a theoretical model in helping to explain and predict user behavior of information technology (Legris, Ingham and Collerette, 2003). TAM is considered an influential extension of theory of reasoned action (TRA), according to (Ajzen and Fishbein, 1980). Davis (1989) and Davis, Bagozzi and Warshaw (1989) proposed TAM to explain why a user accepts or rejects information technology by adapting TRA. TAM provides a basis with which one traces how external variable influence belief, attitude, and intention to use. Two cognitive beliefs are posited by TAM; Perceived usefulness and Perceived ease of use. According to TAM, ones actual use of a technology system is influenced directly or indirectly by the user's behavioural intentions attitude, perceived usefulness of the system and perceived ease of the system. TAM also proposes that external factors affect intention and actual use through mediated effects on

perceived usefulness and perceived ease of use and appears to be able to account for 40 percent to 50 percent of user acceptance as well evolved overtime.

In the past, various methods were employed in examining the ability of an individual, starting from oral to written, practical to theoretical and paper and pencil to electronic. The present information and communication technology method of assessing students in Joint Admission and Matriculation Board is the use of electronic computer systems in place of manual or paper and pencil method which is characterized by massive examination malpractices, including examination leakage, impersonation, demand for gratification by agents, bribe taking by supervisors of examination and to absolve the latest innovation in the world of teaching, learning and training. It is against this background that this study is to assess the true situation with regards to the student's perception of Joint Admission and Matriculation Board computer based examination in Nnamdi Azikiwe University, Awka because Joint Admission and Matriculation Board key started computerized examination for the last three years.

1.2 Statement of the Problem

Information and communication technology now controls all aspects of human life such as science and technology and in education in the areas of computer managed instruction and computer aided instructions which are the bases of computer in education like computer based examination as it is commonly called. Joint Admission and Matriculation Board adopted the use of computer based examination to assess students who seeks admission in Nigerian universities. The purpose of computer based examination is to stop manipulation of candidate's examination scores, monitor student's

cognitive understanding, and improve academic programs and ICT proficiency. It is also aimed at eradicating examination malpractices, quick release of examination results and enhance students' learning through vast online materials and reduce to barest minimum, the problems faced by the traditional method of examination i.e. Paper –pencil based assessment.

Computer based examination are assessment backbone in the modern digital era without which effective assessment and evaluation may not be realized. Further, the system advantages associated with computer based examination is important to explore the assessment mode and opinion of the students being assessed. To comply with this demand, student's perception on the advantages and disadvantages of computerized examination is important, since user's perceptions and criticism are crucial in the acceptance, implementation and improvement of computerized examination.

Despite the effectiveness of computer based examination in modern assessment process, it happens to be mismanaged by joint admission and matriculation board in Nigeria. The use of computer based examination which is the backbone of modern examination was degraded to a limited trend. Computer based examination is a programmed assessment with the aid of computer based technologies and students' are marked automatically through the response and answers submitted by every individual students and scores been sent to their mobile phone or by checking the website. These deny the aspect of taking into cognizance the perception of students been assessed by the management of joint admission and matriculation board through online assessment feedback. This causes lapses on computer based examination and inevitable decline on the

use of computerized examination method by students' which affects their perception towards the use of the latest innovation. In view of the above problems this study therefore, seek to undertake an assessment of students' perception of joint admission and matriculation board computer based examination in Nnamdi Azikiwe University, Awka.

1.3 Objectives of the Study

This study is aimed at assessing the perception of students on the computer based examination; specifically the study sought to find out:

1. Examine the perception of students on the use of Joint Admission and Matriculation Board computer based examination in Nnamdi Azikiwe University, Awka.
2. Find out the difference between male and female students' perception on the use of Joint Admission and Matriculation Board computer based examination in Nnamdi Azikiwe University, Awka.
3. Ascertain the factors that determine students' perception on the use of Joint Admission and Matriculation Board computer based examination in Nnamdi Azikiwe University, Awka.
4. Determine the difference between the age groups on the perception of students' on the use of Joint Admission and Matriculation Board computer based examination in Nnamdi Azikiwe University, Awka.
5. Find out the difference between educational qualification of students' on their perception of the use of Joint Admission and Matriculation Board computer based examination in Nnamdi Azikiwe University, Awka.

1.4 Research Questions

The following research questions are drawn to guide the study:

1. What is the perception of students' on the use of Joint Admission and Matriculation Board on computer based examination in Nnamdi Azikiwe University, Awka?

2. What is the difference between male and female students' perception of Joint Admission and Matriculation Board computer based examination in Nnamdi Azikiwe University, Awka?

3. What are the factors that determine students' perception on the use of Joint Admission and Matriculation Board computer based examination in Nnamdi Azikiwe University, Awka?

4. What is the difference of age groups of students' perception on the use of Joint Admission and Matriculation Board computer based examination in Nnamdi Azikiwe University, Awka?

5. To what extent does educational qualification of students' determine their perception of the use of Joint Admission and Matriculation Board computer based examination in Nnamdi Azikiwe University, Awka?

1.5 Research Hypotheses

The following null hypotheses were formulated for the study:

1. There is no significant difference between the perception of male and female student's on the use of Joint Admission and Matriculation Board on computer based examination in Nnamdi Azikiwe University, Awka.
2. There is no significant difference in the perception of student's in different age range of the use of Joint Admission and Matriculation Board computer based examination in Nnamdi Azikiwe University, Awka.
3. There is no significant difference among students of different educational qualifications on their perception on the use of Joint Admission and Matriculation Board computer based examination in Nnamdi Azikiwe University, Awka.

1.6 Significance of the Study

This research work would be significant to Joint admission and matriculation board, Nnamdi Azikiwe University ICT directorate, other Universities, instructional designers, school administrators, curriculum developers, professional associations, students and lecturers on the areas of student's perception and view towards information and communication technology in education. The findings from this study would create awareness for the management of Joint Admission and Matriculation Board to know student's perception on the use of computer based examination and improves on its present status. Also, it would assist Joint Admission and Matriculation Board to find out what have been the students' constraints and factors on the use of computer based

examination and to improve their mode of operations in computer based examination. The finding of this would be of benefits to students, lecturers, National Examination Bodies and universities in Nigeria.

The study could help provide universities and other educational establishments with useful information or fact on the level of information and communication technology resources, computer literacy and compliance of students by providing to them adequate training of the required manpower to help teach them the much needed manipulative skills to students or candidate. The result of this research study will help both Federal and State Government to lay more emphasis on Computer or ICT in education and budget more funds to our educational sector as recommended by UNESCO and for the full implementation of ICT in education in Nigeria.

It will also enable all education stakeholders like the teachers, educational planners, curriculum and instructional designers with other professional associations in the system to design and redesign the mode of examination (education) from traditional conventional method to computerized based method (digitalized) method of assessment or education to be introduce at all levels of our educational system from primary to secondary schools to help teach, equip and prepare students ahead of the new innovative of joint admission and matriculation board computer based examination and other internal and external digitalized examination to fit in the informative age, as the whole world is shifting the assessment paradigm with advance ICT technologies for quality assessment delivery. It will further provide empirical evidence of computer based examination.

1.7 Scope of the Study

This study was focused on the "Assessment of students' perception of Joint Admission and Matriculation Board computer based examination in Nnamdi Azikiwe University, Awka. It was limited to students of Faculty of Education in Nnamdi Azikiwe University. In addition, only the first year undergraduate students of Faculty of Education in the university participated as respondents to the questionnaire that was administered, this is because the study does not cut across faculties and subject areas. The variables considered were gender, age, qualification and nature of entrance examination.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Introduction

The literature review for this study is discussed under the followings; Conceptual Framework. Rationale for Introducing ICT in Educational Assessment. An Over View of Computer Based Examination in Education. Students General Perception of Computer Based Examination. Impact of Gender Influence on Students Perception of Computer Based Examination. Factors Associated with Student's Perception on the of Computer Based Examination. Empirical Studies and Summary of Related Literature.

2.2 Conceptual Framework

Electronic examinations propelled the large scale of testing as a means of assessing teaching and learning which further supported the standardized testing process. The concept of e- Examination dates back to the Plato System (1960) from the University of Illinois. This was commercialized by control Data Corporation (then owner of Plato) in the 1970s, starting with online testing system for National Association of Securities Dealer (now the financial industry authority), a private sector regulator of the United States of America securities markets. The system was developed by Michael Stein, E. Clarke Porker and Plato veteran Jim Ghesquiere in cooperation with NASD executive Frank McAuliffe. The testing business grew slowly and was ultimately spun off from CDC as Drake training and technologies (today Thomson prometric) in 1990 this was then transitioned off, of the mainframes to a LAN- based client – server architecture (with Novell), and the testing business exploded in the 1990s with increased networks together

with information technology certifications and testing centers from various companies, including Novell and Microsoft. Further expansion was occasioned by Pearson VUE, founded PLATO / Prometric veterans E. Clarke porter, Steve Nordberg and Kirk Lundeen in 1994, who were one of the first to use the internet and developed self- service test registration. Today the computer based testing industry has continued to grow, add professional licensure and educational testing as important business segments of the industry (Pearson, 2001).

The predominant mode of testing student's in Nigeria is paper based examination. Paper pencil examination in Nigeria is characterized by different form of examination malpractices, such as bringing inside examination hall unauthorized materials, writing on Naira currency notes and identity cards, spying of other candidates in examination hall, substitution of answer sheets and change of examination scores or grades. Others include, impersonation, leakage of questions to students before the examination day, conniving with supervisors and school authorities to cheat, establishment of special or magic examination centers across the country, writing on body especially females on hidden parts of their bodies. The success of transition from one test method depends on the extent and ability of testing professionals to communicate the benefits and limitations of that test method to stakeholders (Jones, 2000).

In most applications, test items on paper pencil examination, computer based examination are identical in terms of content and delivery sequence. Educators often need to assess students learning and achievement. There are multiple forms of assessment that educators use to not only gain knowledge about a student level of understanding but also

to guide the direction of future lesson and course curriculum. In paper pencil examination, students provide written responses to written items**.** Examination in which you fill out answers on the examination form itself falls under this category. Typically paper pencil examination includes questions to be answer, topic to address through paragraph responses, problem to solve and analyze. Paper pencil examination refers to general group of assessment tools in which the candidates read questions and respond in writing. This includes test such as personalized and interest inventories. Paper pencil examination can be used to access job related knowledge and ability qualifications. Besides, many students can be assessed at the same time with a paper pencil examination such examination is an example of method of assessment (Jones, 2000).

Examination can be define as a formal test involving answering written or oral question with no or limited access to text book. Ancient China was the first country in the world that implemented a nationwide standardized test or examination which was called the imperial examination, was to select candidates for specific governmental positions. The imperial examination was established by the Sui Dynasty in 605 AD and was later abolished by the Qing Dynasty 1300 years later in 1905. England had adopted this examination system in 1806 to select specific candidates for positions in Her Majesty Civil Service, modeled on the Chinese imperial examination. This examination system was later applied to education and it started to influence other parts of the world as it became a prominent standard (e.g. regulations to prevent the markers from knowing the identity of candidates) of delivery standard was the burgeoning civil service that began to move toward a meritocratic basis for selection in the mid 19th century in England. British Civil Service was influenced by the imperial examinations system and meritocratic system of China. As early as in 1806, the

Honourable East India Company established a college near London to train and examine administrators of the company territories in India. Examinations for India Civil-Service- a team coined by the company were introduced in 1829 (Pearson, 2001).

In 1853 the Chancellor of the Exchequer William Gladstone, commissioned Sir Stafford North Cote and Charles Trevelyan to look into the operation and organization of the civil service. Influenced by the ancient Chinese imperial examination, the North Cote Trevelyan Report of 1854 made four principal recommendations, that recruitment should be on the basis of merit determined through standardized written examination, that candidates should have solid general education to enable inter-departmental transfers, that recruits should be graded into a hierarchy and that promotion should be through achievement, rather than preferment, patronage or purchase. Civil service commission was also set up in 1855 to oversee open recruitment and end patronage, and most of the other North Cote Trevelyan recommendations were implemented over some years. The North Cote – Trevelyan model of meritocratic examination remained essentially stable for a hundred years. This was a tribute to its success in removing corruption, delivering public services (even under the stress of two world wars) and responding effectively of political change. It also had a great international influence and was (adopted by members of the Common Wealth). The Pendleton Civil Service Reform Act established a similar system in the United State. Written examinations have been unheard of before 1702 for Europeans education (Pearson, 2001).

"The Chinese examinations were described repeatedly in western literature on China of the seventeenth and eighteenth centuries". Standardized testing began to

influence the method of examination in British universities from the 1850s, where oral examination had been the norm since the middle ages. In the United States of America, the transition happened under the influence of the educational reformer Horace Mann. This shift helped education to fit into this modern era creating a rationale method for the evaluation of teachers, students and institutions. Both World War I and World War II demonstrated the necessity of standardized test. Test was used to determine the mental aptitude of recruits to the military. The US Army used the Stanford-Binet intelligence scale to test the IQ of the soldiers. After the war industry began using tests to evaluate applicants for various jobs based on performance in 1952, the first Advanced Placement (AP) test was administered to begin closing the gap between high schools and colleges (Pearson, 2001).

Martell and Calderson (2005) are of the view that examination is not new to academics of the current movement dating back over two decades. But two decades take us back to origins of educational assessment in the United States. Assessment of students' performance in teaching and learning have been gaining and losing popularity for well over 150 years. K-12 education testing first emerged in American in 1840's when an early pioneer of assessment, Horace Mann, used standardized written examinations to measure learning in Massachusetts. In 1960's saw further support of standardized testing when the National Assessment of Educational progress was formed which produced the nation's report card in United States of America (Martell and Calderson, 2005).

The NCLB act is a sweeping piece of legislation that acquires regularity administered standardized testing to document student performance. Its act is based on

standards and outcomes, measures results and holdings schools and testing agencies for student learning. Assessment experts point to pioneers of the assessment movement, Alverno College and Northeast Missouri state university which have both been committed for over three decades to outcomes based instruction. Urciuoli (2005) states that the oldest recognized undergraduate assessment programme in the United States of America can be found at the University of Wisconsin which has reported on some form of student performance and perception outcomes testing assessment continuously started since 1900. The historical development of examination is not limited United States of America and rest of the western world, like the United Kingdom where higher education founding council was established following the further and higher education Act of 1992 requiring the assessment of quality education in funded Institutions and the higher education Act was passed in 2005 with the innovative goals of widening access to higher education as well as keeping United Kingdom Institutions competitive across the globe. It continues down to African and Nigeria as a worldwide educational practices innovation (Urciuoli, 2005).

Ojerinde (2011) states that the punch card machines was replaced in the 1970s with optical mark reader which not only shortened examination processing time but also increased the efficiency of scoring of multiple choice examination items. Computer based examination as medium for entrance examination in education, military training and certification examination by professionals groups and promotional examinations in various stages and categorizes of life cannot be over-emphasized. Erle (2006) observes that computer based examination has gained popularity as a means of testing with large scale professional examination such as United States medical licensing examination in

1999. Thus by 2000s, the Directorate of Joint Admission and Matriculation Board had introduced e – registration of candidates for its examinations, online SMS results checks and online verification and confirmation of examination results. With these developments students were able to access their results with their mobile phone and computer. While higher institutions in Nigeria could verify and confirm the authenticity of student examination results with ease, Federal Ministry of Education (2012). With the publication of the roadmap for the Nigerian education sector in the application of technology in public examinations has been extended to the electronic capture of candidates biometric data for authentication and admittance of students into examination halls and the battle against examination malpractice is gradually being won by the application of information and communication technology tools in teaching and learning. Still in the bid to reform assessment and examination practices in Nigeria, the Joint Admission and Matriculation Board pioneered the first computer based examination in public external examination in Nigeria (Vanguard, 8th November, 2015).

Ayo, Akinyemi, Adebiyi, and Ekong, (2007) postulated that the advent of web application into the computing technology has brought about a significant revolution on our social life including the traditional system of education, assessment versus examination. Many examination and testing agencies have shifted from paper pencil mode of examination to electronic means of examination as well as providing Instructional resources through the Internet. The threat of computer based examination performance on the reliability and validity of examination have made the Management of Joint Admission and Matriculation Board under Federal Ministry of Education to go full scale this year 2015 (Vanguard 8th November, 2015). Computer based examination is administered on

computer screen and presentation of multiple choice knowledge test and question banks. The computer mark or assess response provided by the candidates through installed educational software. When student's finishes the examination, the computer system gives him / her a pictorial presentation of their performance immediately and while the final results are made available to candidate on the same day through short message service (s m s), email or by checking the website of Joint Admission and Matriculation Board with their username, password and purchased scratch card. Different questions formats in which question are not following the same order, these was to evaluate the inner and outer most cognitive, psychomotor, affective domain of the attitude and performance of the learner.

Thompson, Thurlow, Quenemoen, and Lehr (2002) said that there is currently a strong interest in computer based examination and advocates have identified many positive merits of this approach to assessment and examination including efficient administration, student preference, self selection options for students, improved writing performance, built in accommodations, immediate results, efficient item development increased authenticity and the potential to shift focus from computer based assessment to computer based instruction. The links between observation and Interpretation through computer based technologies make it possible to score and interpret multiple aspects of student performance on a wide range of task chosen from cognitive features and compare the results against profile that have interpretative value. Computer based examination is still new phenomenon to our educational system in Nigeria. However computer based examination in Nigeria poses a lot of factors, constraints and challenges. Olawale and Shafi'I (2010) opines that the existing biometric and non biometric e-examination system

involved sending examination questions to the e-exam centre from the examination bodies, where the operator will then enter the questions into the system. The biometric system consist of picture box and finger print scanner that collect the biometric data of the candidate. But due to the transferring of the question involved the security of the system is at risk. There may be or a lower security of sensitive personal on computer based examination.

Computer based examination is relatively a new techniques in Nigeria that many examination bodies like Joint admission and matriculation board, higher institutions, professional bodies / organization and learning establishment are recently adopting. Thompson (2008) Computer based examination for more than a decade has been called "new frontier of testing". Computer based assessment has matured and is no longer new frontier in most global community. Gaytan and McEwen (2009) defined online assessment as a system for evaluating student's academic achievement in an electronic environment. Joint Information Systems Committee (2008) descry that the term e-assessment as a broadly based one covering a range of activities in which digital technologies are used in assessment or test process. Whittington, Bull, and Danson (2000) they also perceives computer based examination are the form of assessment in which computer is an Integral part of question papers delivery, response storage, marking response or reporting of results from test or exercise administered.

It encompasses the use of information and communication technology resources to collect performance and achievement, in diagnostic testing of learning or many other similar application of instructional testing. Students perception and performance on computer based examination depends on how the assessment is been presented to them on

the day of the examination. For it to achieve its desirable performance objectives, it has to meet all the necessary criteria of adopting computer based examination as a way of assessment and evaluation in any testing system to improve educational outcome. McConnell and Schoenfeld-Tachner (2001) viewed computer based examination as a way to increasingly provide a quick method of marking assessment for large groups of students. Computer based examination is the logical extension of computer based learning. Computer based examination refers to the use of computer to deliver, score, select items and report scores of the assessment.

2.3 Rationale for Introducing ICT in Educational Assessment

Information and communication technology now controls all aspect of human life that is science, technology and education. Mooji (2007) is of the view that differentiated information and communication technology based education can be expected to provide greater reliability, validity and efficiency of data collection and greater case of analysis, evaluation and interpretation at any educational level. It allows mass customization in terms of content and examination. E-Education can provide access to the best gurus and best practices or knowledge available. Simons, Smaldino, Albright and Zvacek (2003) ascertained that information and communication technology foster collaborative learning. Information and communication technology was introduced to bring about the global change in education as it is affecting all spheres of human life. Abimbade (2006) said that the impact of technology worldwide has led to the globalization of information and communication technology in education. UNESCO (2002) states that information and communication technology as the combination of informatics technology with other

related technology, specifically communication technology. A great deal of research has proven the benefits information and communication technology to the quality of education (Al-Ansari, 2006). Information and communication technology have the capacity to innovate, accelerate, enrich and deepen skills, to motivate and engage students to help relate school experience to work practices, create economic viability for tomorrow, workers as well as strengthening teaching and helping schools to change (Yusuf, 2005). Information and communication technology has become a necessity in our everyday life and have affected the perception of this Net generation towards every things around them. Jhurre (2005) states that much have been said and report about the impact of technology especially computers in education. Wright, Stanford and Beedle (2007) describes information and communication technology as giving opportunities for students to explore, discover, create, communicate effectively and freely with instructors, complete and receive assignments and feedback online, initiate and participate in online discussions. It is an umbrella term that includes communication device or application, encompassing radio, television, cellular phones, computers, network, hardware and software, satellite systems and so on, as well as the various services and applications associated with them (Kumar, 2006).

Hepp, Hinostroza, Laval and Rehbein (2004) noted that information and communication technology have been utilized in education ever since their inception, but they have not always been massively present. As a result educators become more focused on the use of these technologies to improve instruction/assessment as a rationale for development of lifelong learners and lifetime investment towards human capacity development (education).

Abdullahi (2013) perceives that information technology is an instructional medium that is currently penetrating to transform the nature of education where and how learning takes place and the roles of students and teachers in the learning process. Some other benefits of information technology as listed in the NCET publication (1994) as cited by Abdullahi (2013) includes giving students' the chance to achieve where they have previously failed, reducing the risk of failure at school. Allowing students to reflect on what they have written and to change it easily, producing a successful piece of writing motivate students to acquire basic literacy skills, giving students immediate access to richer resource materials, presenting information in new ways which help students to understand, assimilate and use it more of readily, removing the chore of processing data manually and free students to concentrate on its interpretation and use and difficult ideas are made more understandable when information and communication technology include the followings below; it is expensive in the procurement of information and communication technology infrastructure and hi-tech equipments, required high specialist of information and communication technology to man the resources and design information and communication technology program, (i.e. instructors), good policies for the implementation of information and communication technology in all sector of the economy especially in education, it makes students not to visit or consult the library, they rather clinch to information and communication technology instructional resources claiming that there is no more digital divide or native and also they are the next generation (NCET publication 1994 as cited by Abdullahi, 2013).

Information and communication technology covers all and other related information communication and technology activities for the purpose of informative process.

Information and communication technologies for education refers to the development of information and communication technologies specifically for instructional purposes, hence information and communication technology improve instructional environment. New Media Consortium (2007) express that information and communication technology presents entirely new learning or instructional environment for students, thus requiring a different skill set to be successful. Critical cognitive thinking, findings and development and specialist skills are on demands in the global world as importance for economy prosperity.

New Media Consortium (2007) states that information and communication technology presents entirely new learning environment or atmosphere for students, thus requiring a different skills set to be successful, critical cognitive thinking/ability, research, and evaluation skills are growing in importance as students have increasing volumes of information from a variety of source. Learning environments need to reflect the potential uses of knowledge that pupil are expected to master, in order to prevent the acquired knowledge from becoming inert.

In this type of situation, learning is no more divided because instructional purposes have gone beyond the old traditional method of instructional and assessment system which was characterized by being teacher centered method that is the teachers tends to benefits more from the instruction given in such situation. But with the application of information and communication technology for the enhancement of instruction and assessment system, turn out to be students or learners centered as constructors of knowledge with the assistance of information and communication technology innovations or features, Cross

and Adams (2007). The ICT rationales in education are explained below for easy comprehension:

Table 2.1 Four Rationales for Introducing ICT in Education

Rationales	Basis
Social	Perceived role that technology now plays in society and the need for familiarizing students with technology.
Vocational	Preparing students for jobs that require skills in technology.
Catalytic	Utility of technology, to improve performance and effectiveness in teaching, management and many other social activities.
Pedagogical	To utilize technology in enhancing learning flexibility and efficiency in curriculum delivery.

Source: Cross and Adams (2007)

Hanna (2012), states that there are three major forms of assessment in education; formative, summative and ultimate.

Formative Assessment: This type of assessment procedure takes place at the early stage of the course or program and runs through the program. It has the advantage of revealing the areas of weakness of the students, ineffective methods and encourages students to learn.

Summative Assessment: This assessment method takes place at the completion of the course. The function is to determine the extent to which the student has acquired skills and knowledge taught in the classroom.

Ultimate Assessment: It is the form of assessment that takes place when the student has completed the training program and obtained employment. This is carried out in the industry or place of work to determine the extent to which objectives of the program have been achieved, (Hanna, 2012).

2.4 An Over View of Computer Based Examination in Education.

Computer based examination is an end to end electronic assessment process where Information and communication technology resources are used for the presentation of assessment activity and the recording of responses. It is used in formal qualification. Dolan (2009) prepared a set of guidelines specifically for computer based assessments. The principles address test delivery considerations, item content and delivery considerations and component content. A variety of topics relevant to computer based examination and universal design is addressed in the component content and delivery considerations sections of the guidelines e.g. text, images, audio, video and each organized according to categories of processing what students apply during test. It is agreed that students with good learning skills, who have high confidence in their academic ability, tend to refer the constructed response type of testing over the multiple choice type.

Ayo, Akinyemi, Adebiyi, and Ekong (2007) cited by Adegbija, Fakomogbon and Daramola (2012), proposed a model for E-examination in Nigeria as a way of curbing examination irregularities. Federal Ministry of Education (2012) pointed out that the ultimate goals of information and communication technology in our national educational system is to deploy technology to support all aspects of national assessment operations in Nigeria, from online registration of candidates, computer based administration of examination and the scoring of examination scripts, to the management of assessment feedback within and across institutions in Nigeria. To assist learning, when looking at this area we must always strive to make the assessment relevant to the overall goals and objectives of the subject matter and to make our assessment part of the learning process to

meet the aspirations and yearnings of that particular society and to determine the effectiveness of any education system because the greatness of any nation or country lies inside its classroom. Chalmers and McAusland (2002) they explained computer assisted assessment in the context pedagogical applications and purpose, noting that it enabled teachers to test their students covering a wide range of content, reduced teacher work load especially in the of double marking, saved time and resources and helped identify students learning problems by adapting to match their abilities. Technology based assessment provide opportunities to measure complex form of knowledge and reasoning that is not possible to engage and assess through traditional method (Bodmann and Robinson, 2004).

These methods and purposes of examination are important because it can measure different skills or sets of knowledge in order to provide new and better information about individual's abilities of understanding and success. Individuals can take a computer based examination even with minimal or no previous computer experience, since a designed instructions provided in a basic computer tutorial before the examination will provide the experience needed to take the examination using a computer mouse. One may spend much time on the tutorial to ensure comfort ability with the computer and with the assessment before the official timed examination. There are two types of computer based examination in education they are explained as follows;

Computer Linear Examination: is a full length examination in which the computer selects different questions for individuals without considering their performance level. It consists of a full range of tests scored in the same way as a paper based test (Professional Testing Inc, 2006). Harding and Rakes (2000) confirmed that new styles of learning have

an exciting image in the world of information and communication technology led innovations, but assessment usually fails to raise enthusiasm. Testing or assessment needs to be taken as a very vital component of the educational process because one of the challenges facing educational Institutions today is the conduct of examinations resulting in valid and reliable scores.

Computer Adaptive Examination: Here, test is one in which the computer selects the range of questions based on individual performance level. These questions are taken from a very large pool of possible questions categorized by content and difficulty (Professional Testing Inc, 2006). Friedrich (2008) noted that computer based examination enables educators and trainers to author, schedule, deliver and report on surveys, quizzes, tests and examination.

The American Psychological Association (1986) and International Test Commission (2005) outlined some guidelines for the introduction of computer based examination is summarized as follows. The America Psychological Association (1986) guidelines and interpretations of computer based examination were published first in 1986. It defines the score equivalent of computerized test and conventional paper and pencil test in two ways. That the rank order of score of individual test in alternative mode closely appropriate to each other. The means dispersions and shapes of scores distribution approximate the same by rescaling the scores from computer test version. The guidelines also require that any effects due to computer administration be either eliminated or accounted for in interpreting scores (American Psychological Association, 1986). Computer based examination introduction and implementation should also be designed to meet the

standard requirements of International Test Commission (Belgium) its guidelines was published in 2005 such that has been summarized under four major points they are as follows, technology, quality, control and security, (International Test Commission, 2005).

Computer based examination has some merits and demerits and all have been listed as follow below. Joint Information Systems Committee (2008) points out that the characteristics of good assessment technique that would have been a strong well evaluated pedagogy, as well as providing support for both staff and students and of course online assessment or test has all the other advantages of remote access and choice of time and place of assessment, although the latter may be limited for summative assessment that require security. Question types can include multimedia material. Provide more flexibility than pen and paper. Easy and secure distribution of assessment material is guaranteed. Document management techniques can be used to organize and store questions and question papers. Marking can be speeded up and even automated in many situation provide opportunity for adaptive tests that respond to the candidates answers. Professional feedback to administrators, teachers or trainers. It takes time and money to produce traditional assessment but computer based examination is quick and simple to produce but slow and expensive to use (Joint Information Systems Committee, 2008).

Computer based examination shift the effort to the front of the process. They are time consuming and expensive to create and quick and simple to use. The pay-back for computer based test is long term but educational budgets are short and medium term does not meet UNESCO specification of educational budget. Computer based test cannot be used for every type of assessment except online assessment. It can be used to assess most types of knowledge and understanding, it has limitations. Infrastructure for traditional

assessment is already in place but infrastructure for e-assessment is not. Centre need to be tooled up for online assessment, (Joint Information Systems Committee, 2008).

2.5 Students General Perception of Computer Based Examination

Students' perception of the fairness of computer based examination, the issue of fairness from the students perceptive is a fundamental aspect of assessment which is over looked by academia. Perception is the process of attaining awareness or understanding of sensory information. The process by which an individual selects, organizes, and interprets stimuli into a meaningful and coherent picture of the world or how we see the world around us. However, once computer based examination have been careful perceived and accepted by students the implementation and improvement can be properly redesign to enhance online examination in education. Bull and McKenna (2004) Stephens and Mascia (1995) Warburton and Conole (2003) there is relatively little research into what students think about computer based examination.

Butler (2003) confirmed the association between a moderate number of tests and better student attitudes especially that students were found to be generally more positive towards the proctored, computer based test facility than toward in class, pencil and paper testing. Reality as experienced by the often forgotten student is an intervening variable, which cannot be neglected if full understanding of student learning is the purpose of our educational research and practices. Ndume, Tilya and Twaakyondo (2008) stated that with the use of these technologies both the teachers and students have been witnessing an excellent perception in academic activities. Cater Rose, Thielle, and Shaffer (2010) and Russell, Almond, Higgins, Clarke-midura, Johnstone, Bechard and Fedorchak, (2003) stated that students have used computers to play games and they may receive some of

their instruction via computers. Students may also prefer computer based test because it has option of customizing the assessment based on personal preferences.

However, students' learning is related to evaluation practices. This provides the rationale for the primary focus of the present inquiry into student's perception about evaluation practices and assessment methods in our current learning environments by improving the quality of the students' learning experience is a key issue in the higher institution of learning and examination bodies and it has been widely recognized that e-assessment can contribute to this. Domino and Domino (2006) stated that if a student does not have confidence in a test, it will affect their levels of engagement and cooperation.

Phillip, Wheater, Langan and Dunleavy (2005) the success of e-assessment depends greatly on how the process is been set up and managed. Greater understanding is needed about the effects of inexperienced markers on assessment and about the involvement of students in the development of marking criteria and how it affects the final mark. On the other hand, Papinezak, Young and Groves (2007) states that the implementation and development of students- involved criteria in computer based examination, but student's perception of e-assessment experience remained quite negative. They suggested that may be students needed years of practice in e-assessment in order to become comfortable with the innovative process.

Dermo (2009) concluded that the perception of e-assessment was consistent regardless of the participants' age and gender. Participants perceived e-assessment as unfair the assignment of random questions from an item bank as they did not feel that the questions were of equal difficulty. Dermo (2009) and Walker, Topping and

Rodriquez (2008) are of the view that students perceived formative e-assessment as less stressful than alternative formats while demanding a similar cognitive level. The presence of feedback during e- assessment was viewed positively as it reinforced learning and provided deeper insight.

Gaytan and McEwen (2007) identified effective e-assessment strategies as rubrics, peer evaluation, threaded discussions, online chats and timed, quizzes, portfolios, and self-assessment. Students perceived the most effective e-assessment tools as self assessments and practice tests, threaded discussions, weekly assignments with immediate feedback, the use of rubrics, and portfolios. Students indicated that e-assessment could be improved by providing meaningful and timely feedback, utilizing a well-designed rubric, and employing a variety of assessment techniques.

2.6 Impact of Gender Difference on Student's Perception of Computer Based Examination

Gender is natural link to a social attribute and opportunity associated with being a masculine and feminine and a mutual relationship of mankind. Gender and self concept are attributes to both male and female while information and communication technology tools are perceived as male sphere which serves both sexes with the forum for exploring the vast opportunity in information and communication technology world and for universal access to education, equity and gender equality in education, for delivery of quality teaching and learning for more efficient educational management, governance and administration. Ewhrudjakpor (2006) noted that these attributes and relationships are socially constructed and learned through socialization processes while technology development serves as forum for exploring the linkage between changing gender relations

and technological development in modern world. Livingston and Codie (2006) reported that while students readily embraced online learning and assessment programme teachers did not. Fluck, Pullen and Harper (2009) educators must consider which assessment techniques permit students to utilize the affordances of new technology in education.

Carlson and Fatcht (2002) stated that the most recent statistics have shown that, unlike earlier statistics did, that females are frequently Internet and computer users than their male's counterpart. Carlson and Facht (2002) this cannot be seen in Swedish statistics, where the use of these functions is shared equally between both gender. An interesting trend in Sweden though males to a greater extent have access to Internet in their homes and it is more common for boys than for girls to have their own computer, (Sjoberg, 2002). An individual's attitude and satisfaction are important variables in learning process. Mason, Padry and Berten (2001) they determined that students must be able to change answers in computer based examination and move between questions. If students are able to change their answers, it makes them more comfortable and reduces examination anxiety. Wingenbach (2000) found no significant association between academic achievement and students' attitude towards computers, computing anxiety levels, attitude towards electronic examination or gender by the introduction of computer based test such a setback was temporary. The students' gender, race or ability can all be the equivalent; however students who have the practice will do better (Brantmeier, 2006).

Jackson (2001) stated that females reported to be more computer anxiety, less computer self-efficacy, and favorable and less stereotypical computer attitudes than males. It has also been reported that males show a more positive attitude toward computer based examination than females (Kadijevich, 2000). It seems that research has

found that technology is no longer reserved for males, but that females react somewhat differently to computers, and also have to deal with different conditions in society regarding these issues of computer based assessment as medium of examination in today's digitalized age. It is interesting to know or observe that girls are scoring high marks than boys in most of the academic and other competitive computer examination.

Improving the quality of the student learning experience is a key issue in higher education sector, and it has been widely recognized that computer based examination can contribute to this globalized world where impossible is made possible through the application of information and communication technology in all aspects of human life. However, it is interesting whilst much research has been carried out on the perception of instructors, students, e- learning experts and educational engineers towards computer based examination. Most studies show that on the average girls performs better boys, girls get higher grades and complete high school at a lighter rate compared to boy (Jacob, 2002). More recently, portfolios, self and peer assessment, simulations and other innovative methods were introduced in higher educational contexts. These concepts make up the current evaluation context. Cheong and Park (2005) who reported that computer based examination had to impact institutions with faster quality and speed of feed which could enhance the capability of academics to pinpoint progress and learning differences. Lenhart, Raine and Lewis (2001) revealed that American youths between the ages of 12 to 17 years go online and there are few statistical differences between the volumes of boy versus girl on internet use. Students' perception about these recent format of e-assessment and the more common multiple-choice and essay examinations constitute an important part of this review.

2.7 Factors that Determine Students' Perception on the Use of Computer Based Examination

Factors and constraints are elements, circumstance that influence a phenomenon that affects the nature, the magnitude and the timing of a consequence. It is also a natural attributes that truly influence a situation of event or element. According to Arbaugh (2000) stated that those critical factors or phenomenon that influence students or learners perception on computer based examination are perceived usefulness and also perceived ease of use, flexibility of e-learning, interaction which class participants student usage and gender. In the same view Piccoli, Ahmad and Ives (2001) are of the opinions that maturity, motivation, technology comfort, technology attitudes, computer anxiety, and epistemic beliefs, technology control, teaching styles, self efficacy, availability, objectivist and constructivist, quality, reliability, face validity, sequence, control, factual knowledge, procedural knowledge, conceptual knowledge, timing, frequency and quality. Computer based examination usually assist to ensure that candidates identity in the examination hall is efficiently cross checked. Computer based examination is efficient way for test sponsors to provide a secure, consistent environment for certification and licensure as it also enhance students' experience (Abubakar and Adebayo, 2014).

This research study accepted the view of Piccoli, Ahmad and Ives (2000) that all these mentioned above are critical factors that influence students perception of e-examination indeed have input in students academic performance in assessment and evaluation process in the latest innovative techniques in education. Stokes (2001) also listed some important factors like students temperaments (guardian, idealist, artisan and rational). Arbaugh (2002) also pointed out some elements and circumstance that influence

students perception of computer based examination like the perceived flexibility of the medium, perceived usefulness and perceived ease of use, media variety, prior instructor experience, virtual immediacy behaviors and interaction. Russell, Hoffman and Higgins (2003) in addition, font text size, the computer screen and graphics, all have a vital role in students' perception. Computers allow educators to add more and new different graphics to online testing, but teachers need to be careful not to distract students.

Hong (2002) opines that the factors that may influence student perception on computer based examination are gender, age, scholastic aptitude learning style and initial computer skill or literate, interaction with instructor, instruction with fellow students, course activities, discussion sessions and time spent on the course or examination. Thurmond, Wambach, and Connors (2002) are of the view that computer skills, courses taken or written, initial knowledge about e- learning and computer based examination technology, live from the main of the institution, age, receive comments in a timely manner, offer various assessment methods, time to spend, scheduled discussions, teamwork acquaintance with the instructors. Studies investigating this issue also resulted into inconsistent results. Many recent studies suggest no difference in the administration mode of computer based examination for gender and ethnicity subgroups (Bennett, Braswell, Orange, Sandene, Kaplan and Yan, 2008). Bridgeman, Gallagher and Cahalan (2000), opines that the differences among the examinee groups may be such a great threat to the comparability that the fairness of the test will be questioned, so additional research on the sub group differences as they relate to mode effect is needed. A few studies have examined the relationship between administration mode and computer characteristics such as screen size, resolution and font size.

2.8 Empirical Studies

Some empirical studies have been carried out on what students feels or perceives on computer based examination. Jimoh, Abduljalul and Kawu, (2012) studied students perception of computer based test for examining undergraduate chemistry courses. The study examine the issues peculiar to chemistry computer based test from other courses, objectives of the study are general constraints on the use of computer based test for chemistry courses, the effect of the test administration mode on students performance, relationship between prior computer experience and performance in computer based testing. The population consist 46 undergraduate chemistry students. Descriptive survey design was adopted for the study and convenient sampling frame of 46 undergraduate chemistry students were used based on the peculiar nature of chemistry course. Due to the peculiar nature of undergraduate chemistry course examiners should take note of this peculiarity in deciding that computer based test mode is appropriate for their examination. The findings of this study revealed that, erroneous questions and inadequate time were among major cause of students' failure with computer based test mode of assessment. It can therefore be concluded that, examination questions prepared for this mode should be error free and also the timing should be adequate.

The result also showed that the conducive environment provided by the system and receiving results automatically using the computer based test system, threat felt when taking computer based test examination as when compared to paper-based test, and the positive experience it offers and its efficiency are important design consideration for this mode of assessment. As for performance that is test score is concerned, respondents are of

the discernment that computer based test mode had effect on their scores. The researchers thereby conclude that there is need for basic training on general use of computer before exposure to computer based test mode of assessment since prior computer experience has a positive influence on performance.

Alabi, Issa, and Oyekunle, (2012) studied the use of computer based testing method for the conduct of examinations at the University of Ilorin. The objectives of the study was to find out what necessitated the changeover to computer based test method, determine the planning stage of the computer based test examination since inception, the procedure for the administration of the examination using the computer based test method, the areas the computer based test method been deployed by the university etc. The study was based on descriptive account of post JAMB screening exercise as conducted by the University of Ilorin since 2005. Also seven out of the nine members of the former post JAMB screening committee and five former invigilators constituted the population of the study. Structured interview was employed to collect data from the immediate past director of the computer based examination examinations in the university. Simple mean, standard deviation and t-test statistics were used. The study revealed that in spite of the giant strides of the University of Ilorin deploying the computer based test method for the university, there would still be room for further improvement so as to sharpen furthers the few rough edges being experienced presently.

Adegbija, George and Bola (2013) Investigated students' views on E-assessment: A case study of University of Ilorin, Nigeria. The purpose of the study is to investigate the general views of students of university of Ilorin on e-assessment and influence of

students' gender on their view of e-assessment in the University of Ilorin. The population made of 4500 students and sample size of 450 students was selected purposively for the study with structured questionnaire was used for the study. The data obtained were analyzed using frequency counts and simple percentage while the chi-square statistics was used to test the hypothesis. The study showed that all the students that responded to the questionnaire did not like online registration because the students have to be searching for commercial cyber cafes to carry out their registration. They also have to use the cyber cafes outside the campus which charge them heavily, beside other problems usually encountered. But many of the students are not against the use of computer based test because the university provides all materials including the computers used for the online examinations. Furthermore, the only hypothesis tested in the study showed that there was a significant difference between the views of male and female students on e-assessment in the University of Ilorin with male perceiving it more positively than their female counterparts. It was concluded the problems of inadequate computers, few and poorly equipped cyber café where students are expected to register online, and most students do not have adequate access to the internet, computer literacy and constant electricity supply are challenges to overcome this innovation to be fully established as a mode of assessment in the university.

Koppel and Hollister (2005) conducted a perusal study to examine the impact on students' performance of computer based assessment as compared to a traditional examination method. The objectives of the study were to examine the performance of students and compare it to traditional examination method that is paper based method. The population consist 50 students and faculty staffs. Research design was survey design.

Instrument used were questionnaire and interview respectively. Three different research tools that mean, frequency counts and percentages were used in the study to collect and interpret results. A structured questionnaire were completed by students to express their computer based assessment experiences, 50 faculty staffs were interviewed who had administered computer based tests to determine students perception of using this medium of testing and analysis of students scores in both conventional paper based examination and computer based assessment. The study revealed that students found computer based assessment easier while significant number of students found it difficult or more difficult to use. All most all the students' preferred computer based assessment and fewer students participated in the study preferred paper based test. Faculty staff members perceived it to be more positive towards computer based assessment in terms of less time of writing animation reduced grading time, simple method of grades and improved validity of examination through post test statistical analysis.

Fluck, Pullen and Harper (2009) educators must consider which assessment techniques permit students to utilize the affordances of new technology in education. The authors conducted a study of e-examination for the students of 4 year bachelor of education program at the University of Tasmania. The population of students is (n=270) achievements were assessed through two equally weighted activities which employed a survey design and questionnaire. First was a home assignment in which students explored learning content through the use of information and communication technology and the second activity was a 2 hour test comprised of 14 questions based on all the material in the unit. At the end of the test, a single page survey with five questions was offered to students. Survey indicated that the surveyed respondents had previously taken a computer

based test examination, majority had practice computer based before e-Examination and some had found it very or moderately useful. The valid responses was (N=230) indicated that most preferred computer based test. The Prior exposure to computer based test was a highly significant factor for preferring the computer medium. Research studies found that online assessment improved the quality of student work, attitude and performance.

However in a study conducted by Tella and Bashorun (2012) investigated the attitude of undergraduate students towards computer based test in university of Ilorin, the objectives of the study is find out the general attitude of undergraduate students on computer based examination. A case study design was adopted and a sample size of 2209 undergraduate students' were selected from seven out the entire faculties and data was collected through computer based test attitudinal survey and a focus group discussion. The investigation revealed that the students have positive attitude towards computer based test. More than average of the respondent prefer computer based test to paper and pencil test. Respondent also demonstrate strong perception of increase in their performance as a result of taking computer based test. On the other hand, problems such as shortage of computer, lack of skills, and loss of data in the process of writing computer based test, slow network and hazards of reading on the screen were also identified. In addition students have positive attitude towards technology usage within an academic setting. This is a reflection of the fact that research that addresses student's perception and performance towards technology need to be conducted to understand the effect of the new technology in University of Illorin more than six years after computer based test was initiated to conduct university based course examination.

Perhaps, a research conducted by Alabi, Issa and Oyekunle (2012) and Jimoh, Shittu and Kawu (2012) are two important studies to check the computer based test conducts in the university but lack the ability to correlate between the student's academic performance with examination satisfaction and students computer ownership.

Gary (2008) at the University of South Wales, Sydney studied of online formation assessment on learning. Objectives are mix of short answers and objective items used similar to the end of course (EOC) as a summative examination, students were provided with individualized automated feedback. The population is 150 students and research design adopted was survey design, the software tools used was (question mark, UK) perception best of breed for online assessment. The outcome of the study reveals contention that integrated well designed online formative assessments can have significant positive effect on learning. Web based formative assessments also support equity and inclusiveness by allowing students to attempt each assessment anonymously on multiple occasions at anytime.

Park (2009) conducted an analysis of the technology model in understanding university students' behavioural intention to use-e-learning. The objectives of the study were an integrated theoretical framework of university student's e-learning acceptance and intention to use based mainly on the technology acceptance model. The objectives of the study were to analyze the relationship of university student`s intention to use e-learning with selected constructs such as their attitude, perceived usefulness, perceived ease of use, self-efficacy of e-learning, subjective norm and system accessibility and to develop a general linear structural acceptance of university students that would provide a school

manager or an educator with implications for better implementation e-learning. Also determined were some descriptive characteristics of e-learning use and those selected constructs. Research design was based on the previous research; a theoretical model was developed for the study. The population consists of university students at Konkuk University`s Seoul campus. There are 13,906 undergraduate students at the Seoul campus. Among them 6,953 students took at least one e-learning course in the spring semester of 2007. Normally a sample size of 200 subjects would be an appropriate minimum, if one wanted. The number of sample subjects was set at 650, about 9 percent of the 6,953 students who were taking e-learning courses. Instrumentation for the study was developed by the researcher based on the objectives of the study and previous literature review and questionnaire was employed. Statistical procedure, data were recorded first in an MS Excel program and later transferred to Statistical Analysis System. The descriptive statistical analysis such as mean, standard deviation, frequency, percent and correlation were implemented using Statistical Analysis System. Results of the present research led to the conclusion that the model will represented the collected data according to the result of good of fit test. One of interesting results of the study is that both e-learning self-efficacy and subjective norm play an important role in affecting attitude towards e-learning and behavioural intention on the use e-learning. Finally, this type of research needs to be implemented in order in other e-learning circumstances of infrastructures. Since the result of the study was limited to only 100 percent asynchronous e-learning, researchers may conduct similar studies to deal with blended learning or synchronous e-learning. Since little research has been done with those types of e-learning it is highly recommended to carry out research employing Technology Acceptance Model.

Sanni and Mohammad (2015) studied an assessment of students' perception of JAMB UTME in Nigeria. The purpose of the study was to examine the perception of students that participated in computer based testing, to examine the challenges faced by those students and to identity ways that could improve the acceptance of computer based testing in Nigeria. Research design employed was mixed methods qualitative and quantitative research method. The study population consists of 534 students in Ahmadu Bello University, Zaria. The instrument used for the study is questionnaire. The statistical tools used were frequency distribution, percentages, and bar charts, cross tabulation analysis, chi-square and Pearson's R correlation analysis. The findings revealed that introduction of computer based testing in the conduct of UTME has attracted majority of the computer based testing examines attention and computer based testing is being prefer to conventional way of writing examination. The specific factors influencing this finding were gender of the respondent, age and above all. Also the respondents perspective indicated that computer based testing was perceived to be confusing and not efficient. However, majority of the student felt that there is need for improve on their centers and provide adequate supply of electricity by having a standby generator. The students confirmed that the effective ways to promote better perception of assessment is through the orientation, testimonials and video tutorial practice before the computer based test examination.

However, developments have mainly transferred traditional assessment approaches have been further limited. Prenky (2001) points out that our life has been influence by a revolution in field of information and communication technology and as a result people's

mentality has changed significantly in recent years. Consequently, pedagogy has become affected and educationists have also started redesigning educational system. On this view, Computer based examination may affect test scores and consequently their equivalence with paper pencil test and that test with reading passage may be more difficult when given on computers.

Olubiyi, Ajadi, and Inegbedion (2010) carried out a study on the perception of learners on electronic examination in open and distance learning institution in National Open University of Nigeria. A case study of Lagos center has a population of 6000 students, 600 students were sampled with structured questionnaire, only 459 were returned that were used for the analysis, using two tailed t-test. The results of his finding revealed that the difference in student perception lies, turkey post hoc analysis was carried out which revealed that the difference of students is on the reduction of examination malpractice, wide coverage of scheme of work, gender differences in the use of computer, student's academic performance and age factor to the use of information technology tools and inadequate facilities and equipment. Lim, Ong, Wilder –smith, Pv., Steet, (2006) examined medical students attitude about computer based vs. paper based testing in University of Singapore through an online survey and questionnaire of final year MBBS students using the frequency counts and simple percentage were tested out of which most of the students preferred computer based test, then some preferred pencil and paper format and few students were un-sure. The study found that, students liked computer based test because of good quality of images and independent of assigned seating positions, students liked computer based test because they could proceed at their own pace while some stated that computer based test examinations was fun, few employed the convenience of

computer based test and 6 cited “equality” as the reason they preferred computer based test over paper pencil testing.

A study by Ayo (2007) on Nigeria Universities stated that most of the applicants were computer literate, while the remaining others were guided through in examination. The total number of respondents who participated in the e-examination conducted in covenant university took electronic examination for the first time and as such found the examination easy, a few found it a little challenging but adjusted with time. The study revealed that only the applicants who had not been involved in any form of electronic examination before and found it difficult.

Mubashrash, Tariq and Shami (2012) they studied the perception of university teachers regarding computer based versus paper based examination in different universities in Pakistan. Research design employed was survey method with questionnaire, the population were 60 public sector and 53 private universities in Pakistan out which 20 public sector and 16 private sector universities were sampled, the simple percentage and chi-square test were used. After the selection of the universities different teaching department of pure sciences, social sciences and professional were included in the study on basis of random sampling technique. In all 410 teachers were asked to complete the questionnaire. Information was collected through a questionnaire completed by 1877 students. It was concluded that overall sampled students were aware of computer assisted assessment comparatively, female students were found to be more highly inclined towards computer assisted assessment sampled students from different department (i.e. commerce, pharmacy and mathematics) and from universities D and E showed a particularly positive attitude towards computer assisted assessment. However, overall

sampled students felt that computer assisted assessment over burden them, and created some administrative and managerial problems, so teacher should probably avoid using this technique of assessment as routine prominent regarding computer assisted assessment referred to by the students included time saving, being more interesting and being unbiased. Disadvantages included hardware and software related problems were encounter during examination. Computer based system of examination have displayed the capacity of removing the anomalies' been faced with the traditional system of examination i.e. paper based examination that was characterized by examination leakage, bribery taking by invigilators and teachers, inconsistency in examination administration, delay of examination results, missing examination scripts and results. Lesson (2006), cited a few potential factors related to mode effect from two perspectives, participant and technology. The participant factors include demographic characteristics of examinees such as gender and ethnicity, cognitive processing, examinees ability, familiarity with computer and anxiety when interacting with computers. The technological issues involve computer interface legibility (such as screen size and resolution, font characteristic, line length and user interface such as scrolling to locate reading, permission for item review and how to present the items – one a time or several a time).

Among the factors related participant characteristic, computer familiarity was examined by several researchers. Additional related studies can be found in Lesson (2006), the flexibility which test takers can interact with the computer is another possible explanation for observed performance differences across administration media e.g. of this flexibility include item review, revision, skipping e.t.c which are natural features in paper pencil examination but often unavailable in computerized examination.

2.9 Summary of Related Literature

This chapter gives insight of conceptual framework, Rationale for introducing ICT in educational assessment, an overview of computer based examination in education, Students general perception of computer based examination, impact of gender difference on students' perception of computer based examination, Factors that determine students' perception on the Use of computer based examination and Empirical studies. The literatures of the empirical studies showed that a well designed computerized examination for students' good perception and opinion of the new system of examination of Joint Admission and Matriculation Board will help them perform well. In essence all the studies conducted that are similar to this present research work were mostly in Nigeria and few across the globe.

Recent researches especially in Nigeria investigated on comparison of computer based examination versus traditional paper pencil method of examination without peculiarity to students' perception of Joint Admission and Matriculation Board computer based examination. The few researches like Alabi, Issa, and Oyekunle (2012) and Olubiyi, Ajadi and Inegbedion (2010) studied on perception and distance learning of innate computer skills of students on the use of computer based examination. This study focussed the use of computer based examination on students' perception to limit the problem encountered when conducting paper pencil based examination in place of computer based examination especially by joint admission and matriculation board and other Nigerian universities that either do not have a functional computerized based examination laboratories or professional that will management the new innovative testing techniques and the computer based examination laboratory centers. Besides, the need for

investigation on the assessment of students' perception on computer based examination is of utmost important in this modern informative age where ICT controls all areas of human life.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter focused on methods that were used in carrying out the study, under the following sub-headings: Research Design, Population of the Study, Sample and Sampling Technique, Instrumentation, Validity and Reliability of the Instrument, Procedure for Data Collection and Procedure for Data Analysis.

3.2 Research Design

This study is based on the ex- post facto design which employs an array of instrument in order to determine the opinion and preferences of the respondents on the assessment of students' perception of the Joint Admission and Matriculation Board computer based examination in Nnamdi Azikiwe University Awka. This design is considered appropriate, for it involves in the collection of information that have already occurred. Keith (2002) states that ex- post facto research design gives specific reason for the differences that would be explored such as differences of income, ethnicity, gender and parent support e.t.c.

3.3 Population of the Study

The population of the study is 25018 students of Nnamdi Azikiwe University, Awka. The target research population for this study was made up of all first year undergraduate students of Faculty of Education in Nnamdi Azikiwe University, Awka.

Table 3.1 Distribution of Students of Faculty of Education and Gender

S/N	Faculty	Male	Female	Total
1.	Education	385	587	972
	Grand Total	385	587	972

Source: Office of the Director of Academic planning unit, Nnamdi Azikiwe University Awka.

This consisted all first year students in the Faculty of Education with population of 972 comprise of 385 male and 587 female students. The distribution of the population is presented in table 3.1

3.4 Sample and Sampling Techniques

A sample size of 274 students were randomly selected based on Krijicie and Morgan (1970) recommendation. The sample was drawn from first year undergraduate students of Faculty of Education in Nnamdi Azikiwe University, Awka only.

Table 3.2 Distribution of Sample Size

S/NO	Faculty	Sample Frame	Sample size	
1.	Education	972	274	
	Total			274

3.5 Instrumentation

Researcher instrument used for data collection is a students' perception of computer based examination questionnaire (SPCBEQ) using four modified likert rating scale and it's contains four sections as well as the same scaling for all sections. A total number of 36 items of researcher made instrument on students' perception of computer based examination questionnaire (SPCBEQ) was used for the study. Section 'A' made up

of the demographic data of the respondent that is gender, age and qualification, section 'B' contained 12 items 'Perception of students' on computer based examination, while section 'C' 13 items 'Gender difference on computer based examination and Section 'D' 11 items 'Factors that determine students' perception on the use of computer based examination. With response mode of Strongly Agree rated as 4, Agree as 3, Disagree as 2, and strongly Disagree as 1 point pertinently.

3.5.1 Validity of the Instrument

The content validity of the instrument was used to validate the instrument; it was assessed by the researcher's supervisors', Computer Scientist, two experts in Instructional Technology section, Department of Educational Foundations and Curriculum, Ahmadu Bello University, Zaria. The outcome of their assessment in terms of item appropriateness and statement clarity determined the content validity of the instrument. Their advice and suggestions like grammatical corrections, addition of more items and if the instrument contains what the study seek to find out e.t.c were used to provide the final copy of the instrument.

3.5.2 Pilot Study

A pilot test was conducted on 10 first year undergraduate students in order to determine the suitability of the instrument. The pilot test was conducted in faculty of engineering of Nnamdi Azikiwe University Awka. It took the first year undergraduate students' one day to respond to all the items in the questionnaire.

3.5.3 Reliability of the Instrument

The data that was obtained from the pilot testing was tested for reliability using the Cronbach alpha statistics for determining reliability co - efficiency. The statistics gave reliability co efficiency (r) of 0.787 for section B; while section C is 0.797 finally section D gave 0.864. Based on the bench mark for acceptance of instrument reliability (1), this instrument was found to be reliable based on the bench mark.

3.6 Procedure for Data Collection

An introductory letter was collected by the researcher from the Department of Educational Foundations and Curriculum, Ahmadu Bello University, Zaria. The letter was presented to the Director of Academic Planning Unit, Nnamdi Azikiwe University, Awka for necessary assistances. After soliciting for their help, students were addressed in Faculty of Education lecture hall and the researcher informed them the purpose of the gathering and what is required of them to do. To collect data for the study, 274 copies of the students' perception of computer based examination questionnaire (SPCBEQ) were personally distributed to the respondents by the researcher in the Faculty of Education but students' were reluctant to fill the questionnaire. In order to ensure compliance and complete return of all the copies of instrument that was administered, the researcher took the pain to wait behind and ensure retrieval of the completed questionnaire for about two working days in the university. Only 272 questionnaires (SPCBEQ) were returned representing 99.1% of the questionnaire administered.

3.7 Procedure for Data Analysis

The analysis was done at two levels; descriptive and inferential. At descriptive level, the simple Statistics of mean and standard deviation were used to answer the research questions. While inferential statistics using Mann Whitney Test was used to test hypotheses one, while the Kruskal –Wallis Test was used to test hypotheses two and three respectively. The statistical package (SPSS) 20^{th} edition was used for the analysis.

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

4.1 Introduction

This chapter focuses on the research results and analysis. This includes Demographic Information of Students by Gender, Age, Educational Qualification, Answers to the Research Questions, and Hypotheses Testing, Major findings of the Study and Discussion of Findings.

4.2 Demographic Information of the Respondents

Table 4.1 Distribution of Respondents by Gender

Variable	Frequency	Percent
Male	117	43.0
Female	155	57.0
Total	272	100.0

Table 4.1shows the distribution of respondents based on gender, Out of 272 respondents, 117 respondents, representing 43% were males, while 155 respondents representing 57% were females. The results signifies that majority of the respondents were female.

Table 4.2 Distribution of Respondents by Age

Variable	Frequency	Percent
16-20	82	30.1
21-25	116	42.6
26-30 Above	74	27.2
Total	272	100.0

Table 4.2 shows the distribution of respondents by age, Out of 272 respondents, 82, representing 30.1% fall in the 16 – 20 age group, 116 representing 42.6 % were in the 21-25 age group while 72 representing 27.2% of 26-30 age group. This could be said to signify that the average age groups of students in tertiary institution between 21-25 and 16-20 are matured and also indicates a better capability of university age.

Table 4.3 Distribution of Respondents by Type of Educational Qualification

Variable	Frequency	Percent
NABTEB	30	11.0
NECO	32	11.8
WAEC	210	77.2
Total	272	100.0

Table 4.3 shows that out of 272 respondents with three different educational qualifications recognized in the country, 30 students have NABTEB representing 11.0%, 32 student's have NECO, representing 11.8% of students while 210 students have WAEC, representing 77.2% of total number of the respondents. This indicates that students with WAEC results have high percentage of the total population.

4.3 Answers to the Research Questions

1. **Research Question one:** What is the perception of students' on the use of Joint Admission and Matriculation Board on computer based examination in Nnamdi Azikiwe University, Awka?

To respond to this question, items 1-12 of the questionnaire were used and the result is show in Table 4.4

Table 4.4 Perception of Students on Computer Based Examination

S/NO	ITEMS	RESPONSE CATEGORY				MEAN	STD
		SA	A	D	SD		
1	The computer based examination was a concrete and rewarding experience	153	93	12	14	3.415	0.801
2	I was satisfied with writing examination with computer	126	110	22	14	3.279	0.821
3	The computer based examination was too difficult to answer	123	84	41	24	3.125	0.971
4	The computer based examination was disorganized in test administration centers	92	95	55	30	2.915	0.988
5	The computer based examination was efficient and effective for the conduct of examination	117	105	38	12	3.202	0.841
6	Computer based examination was a positive way for immediate release of examination results	109	107	36	20	3.121	0.903
7	Computer based examination consume a lot of examination time	101	84	47	40	2.904	1.061
8	Computer based examination was conducted in a good e-classroom/internet classroom for assessment of students	111	121	30	10	3.224	0.785
9	The computer based examination was too wearisome	85	100	59	28	2.889	0.965
10	Computer based examination was enjoyable than paper based examination	129	93	34	16	3.231	0.885
11	Computer based examination is more preferable than paper based examination	110	100	42	20	3.102	0.919
12	Most computer based examination items and answers were blank and missing on the computer screen	84	97	60	31	2.860	0.984
Cumulative mean						**3.105**	

Decision mean = 2.50000

Table 4.4 shows the general perception of students on Joint Admission and Matriculation Board computer based examination. It was discovered that the cumulative mean response of 3.105 on all the 12 items on computer based examination was found to be higher than the decision mean of 2.5000 indicating a positive response/agreement with the items. In summary therefore the general perception of students on computer based examination is that computer based examination was a concrete and rewarding experience and also computer based examination was enjoyable than paper based examination.

2. **Research Question Two**: What is the difference between male and female students' perception of Joint Admission and Matriculation Board computer based examination in Nnamdi Azikiwe University, Awka?

   To respond to this question, items 13-25 of the questionnaire were used and the result is shown in Table 4.5.

Table 4.5 Students' Gender Difference on Computer Based Examination

S/NO	ITEMS	RESPONSE CATEGORY				MEAN	STD
		SA	A	D	SD		
13	Many students choose computer based examination over paper based examination	46	124	76	26	2.698	0.861
14	Students see computer based examination as a form of programmed assessment with the aid of a computer and internet	97	143	22	10	3.202	0.738
15	Students perceive computer based examination as a means of developing competence in computer education	80	125	53	14	2.996	0.835
16	Do you feel students see computer based examination as what could give them much needed practical ICT skills	91	84	67	30	2.867	1.004
17	The computer based examination was favorable to students	47	133	48	44	2.672	0.944
18	Do you think that there is fairness in computer based examination	98	86	64	24	2.948	0.974
19	Do students see computer based examination as a particular gender sphere	48	107	80	37	2.610	0.930
20	All students possess strong attitude towards the development of practical ICT skills and compliance via computer based examination	79	92	61	40	2.772	1.027
21	Do you believe equity is guaranteed in computer based examination	70	105	64	33	2.779	0.965
22	Gender should not be regarded as an issue when considering computer based examination	65	102	74	31	2.739	0.949
23	Females find it difficult to concentrate than males during computer based examination	58	87	66	61	2.522	1.062
24	Females consider computer based examination to be more stressful	47	98	76	51	2.518	0.986
25	Males prefer computer based examination to paper and pencil examination	63	78	91	40	2.397	1.001
	Cumulative mean					**2.747**	

Decision mean =2.5000

Table shows 4.5 show the difference between male and female students perception on the use of Joint Admission and Matriculation Board computer based examination. It was discovered that the cumulative mean response of 2.747 on all the 13-25 items on gender difference on computer based examination was found to be higher than the decision mean of 2.5000, indicating a positive response/agreement with the items. In summary, gender difference on students' perception on the use of Joint Admission and Matriculation Board computer based examination; is that both male and female student respondents see computer based examination as a form of programmed assessment with the aid of a computer and internet. In addition student's perceived computer based examination as a means of developing competence in computer education.

3. **Research Question Three:** What are the factors that determine students' perception on the use of Joint Admission and Matriculation Board computer based examination in Nnamdi Azikiwe University, Awka?

   To respond to this question, items 26-36 of the questionnaire were used and the result is shown in Table 4.

Table 4.6 Factors that Determine Students' Perception on the Use of Computer Based Examination

S/NO	ITEMS	RESPONSE CATEGORY				MEAN	STD
		SA	A	D	SD		
26	Poor computer literacy affect students perception In computer based examination	91	100	44	37	2.9007	1.0107
27	Cost of buying personal computer influence students' choice/perception on computer based examination	68	117	46	41	2.779	0.988
28	Inadequate ICT manpower to man computer influence student's perception on computer based examination	63	122	48	39	2.768	0.965
29	Lack of enough examination time frames in computer based examination	76	85	90	21	2.794	0.938
30	Lack of a well designed examination instruction on the use of computer based examination	71	120	52	29	2.856	0.928
31	There is deficiency in gender equity and perception in the use of computer based examination	52	91	86	43	2.558	0.973
32	Insufficient e-classroom influence students perception of computer based examination	65	86	74	47	2.621	1.030
33	Epileptic power supply in our country affect student's perception on computer based examination	53	38	121	60	2.6-91	1.023
34	Poor ICT funding on the part of all levels of government and donor agencies influence students' perception of computer based examination	75	106	52	39	2.797	1.001
35	Ineffective ICT policy and implementation from government affects students perception on computer based examination	54	107	56	55	2.588	1.023
36	lack of local computer literatures in Nigeria	54	72	83	63	2.430	1.053
	Cumulative mean					2.605	

Decision mean = 2.5000

Table 4.6 shows the Perception of respondents on the factors that influence students' perception on the use of Joint Admission and Matriculation Board computer based examination It was discovered that the cumulative mean response of 2.605 on all the items 26-36 on computer based examination was found to be higher than the decision mean of 2.5000, indicating a positive response/agreement with the items. In summary, on factors that influence students' perception on the use of Joint Admission and Matriculation Board computer based examination is that poor computer literacy affect student's perception on computer based examination and lack of a well designed examination instruction on the use of computer based examination.

4. What is the difference of age groups of students' perception on the use of Joint Admission and Matriculation Board computer based examination in Nnamdi Azikiwe University, Awka?

Table 4.7 Descriptive Mean Statistics of Age Group Differences of Students' Perception of Computer Based Examination

Variable	Age Group	N	Mean Scores	SD	Remarks
Computer Based Examination	16 – 20	82	125.96	2.507	Differences exist on the account of age group
	21 – 25	116	134.91	2.350	
	26 - 30	74	154.78	3.101	

Table 4.7 Shows differences exist in the mean scores of students' perception on account of age groups. This implies that 16 - 20 years have a mean score of 125.96 with standard deviation of 2.507, 21-25 years have mean score of 134.91 with a standard

deviation 2.350 while 26-30 mean score is 154.78 and standard deviation of 3.101 respectively.

5. To what extent does educational qualification of students' determine their perception of the use of Joint Admission and Matriculation Board computer based examination in Nnamdi Azikiwe University, Awka?

4.8 Descriptive Mean Statistics of Educational Qualification Differences of Students' Perception on Computer Base Examination

Variable	Qualification	N	Mean Scores	SD	Remarks
Computer Based Examination	NABTEB	30	141.03	2.005	No Difference exist on the basis of Educational Qualification
	NECO	32	137.34	3.541	
	WAEC	210	135.72	3.556	

Table 4.8 Shows differences that exist in the mean rank of students' perception on the basis of educational qualification. This implies that students who obtained NABTEB have mean score of 141.03 with a standard deviation 2.005 while mean score of 137.34 and standard deviation of 3.541 for students who have NECO then mean score of 135.72 and standard deviation of 3.556 for students that obtained WAEC pertinently.

4.4 Hypotheses Testing

This section shows the statistical analysis of the three hypotheses formulated to guide the study**.**

Hypothesis One: There is no significant difference between the perception of male and female student's on the use of Joint Admission and Matriculation Board on computer based examination in Nnamdi Azikiwe University, Awka.

To test this hypothesis one, Mann Whitney statistics on the gender difference of student's perception on the use of Joint Admission and Matriculation Board computer based examination was used to show the result in table 4.9.

Table 4.9 Mann Whitney Test of Perception of Computer Based Examination Based on Respondents' Gender

Test Statistics	**Values**
Man Whitney U	7284.000
Wilcoxon W	19374.000
Z	-2.782
Asymp. Sig. (2 tailed)	.005

Mann Whitney U = 7284.000, Z= -2.2782, P=0.005

Table 4.9 shows the non parametric test statistics of Mann Whitney significant differences exist between male and female respondents on their perception of Joint Admission and Matriculation Board computer based examination in Nnamdi Azikiwe University, Awka. Reason that being the calculated p- value of 0.005 is lower than 0.05 alpha level and Man Whitney test score of 7284.000 is higher than the *Z* scores of -2.782. Female students had higher perception than their male counterparts. The null hypothesis is hereby rejected.

Hypotheses Two: There is no significant difference in the perception of student's in different age range of the use of Joint Admission and Matriculation Board computer based examination in Nnamdi Azikiwe University, Awka.

To answer this hypothesis two, Kruskal Wallis statistics of students' age on their perception of Joint Admission and Matriculation Board computer based examination were used to show the result in table 4.10 below.

Table 4.10 Kruskal Wallis Test on Perception of Computer Based Examination Based on Respondents' Age.

Test Statistics	**Values**
Chi – Square	6.136
Df	2
Asymp. Sig.	.047

X^2 (2) = 6.136, P = 0.047

Table 4.10 shows the non parametric test statistics of Kruskal- Wallis shown that significant differences exist in the perception of respondents' age group on Joint Admission and Matriculation Board computer based examination in Nnamdi Azikiwe University, Awka on account of age groups. This is because the calculated p-value of 0.047 is higher than 0.05 alpha level of significant. The higher the age, the higher their perception. The null hypothesis is thereby rejected.

Hypothesis Three: There is no significant difference among students of different educational qualification of their perception on the use of Joint Admission and Matriculation Board computer based examination in Nnamdi Azikiwe University, Awka.

To analyze these hypotheses three, Kruskal Wallis statistics of educational qualification differences among students on their perception of the use of Joint Admission and Matriculation Board computer based examination was employed to show the result in table 4.11 below.

Table 4.11 Kruskal Wallis Test Perception of Computer Based Examination on The Basis of respondents' Educational Qualification.

Test Statistics	Values
Chi – Square	.124
Df	2
Asymp. Sig.	.940

$$X^2 (2) = 0.124, P = 0.940$$

Table 4.11 shows the results of the non parametric test statistics of Kruskal- Wallis analysis revealed that there is no significant difference of respondents' on the basis of their educational qualification on the use of computer based examination. This is because the calculated p- value of 0.940 was found to be higher than the 0.05 alpha level of significant. The students qualification does not significantly determine their perception. Therefore the null hypothesis is hereby accepted and retained.

4.5 Summary of Findings

The study found out that:

1. Students' generally perceived computer based examination as a concrete and rewarding experience and enjoyable than paper based examination.
2. Both male and female students' have positive perception towards computer based examination and they perceived it as a means of developing competence in computer education therefore computer based examination is not gender bias.
3. Lack of poor computer literacy and a well designed examination instruction affect students' perception on the use of computer based examination.

4. The study revealed that age differences exist on the account of age group of students' and the higher the age the higher their perception on the use of computer based examination.
5. It also shows that no differences exist on the basis of students' educational qualification towards their perception on computer based examination.

4.6 Discussion of Findings

This study found out that respondent's perceived computer based examination for the assessment of students in Joint Admission and Matriculation Board as a concrete and rewarding experience and also that computer based examination was more enjoyable than paper based examination. This study agreed with the assertion of Erturk and Sanli (2004) who found the same thing when they noted that students perceive online assessment as fair, as capable of providing effective feedback, and as a stimulus that caused them to reflect on their learning. Dermo (2009) and Walker, Topping and Rodriquez (2008) whom are of the view that students perceived formative e-assessment as less stressful than alternative formats while demanding a similar cognitive level. The presence of feedback during e- assessment was viewed positively as it reinforced learning and provided deeper insight.

As it relates to assessment of students' perception of Joint Admission and Matriculation Board computer based examination in Nnamdi Azikiwe University, Awka the study found that students' find computer based examination enjoyable than paper based examination. This also confirms the position of Domino and Domino (2006) that if a student does not have confidence in an examination it will definitely affect their level of engagement and cooperation. It also agrees with the study of Tella and Bashorun (2012)

who found that students have positive attitude towards computer based examination and more than average of the students' prefer computer based examination to paper and pencil examination as respondents also demonstrated strong perception of increase in their performance as a result of taking computer based test and students' have positive attitude towards technology usage within an academic settings.

The male and female students' perception on the use of Joint Admission and Matriculation Board computer based examination; the study found that both male and female students' perceives computer based examination as a form of programmed assessment with the aid of a computer and internet. And also they are of the view that computer based examination was a means of developing competence in computer education. This corroborates the findings of Fluck, Pullen and Harper (2009) found that most students' preferred computer based test and prior exposure to computer based test was a highly significant factor for preferring the computer medium. They concluded that online assessment improved the quality of student work, attitude and performance.

The factors that determine student's perception on the use of computer based examination the study revealed that students recognized that the factors of poor computer literacy affect their perception on computer based examination and lack of well designed examination instruction on the use of computer based examination. This confirms the position of Hong (2002) who opined that the factors that may influence students perception on computer based examination include gender, age, scholastic aptitude learning style, computer skills or literate , interaction with instructor, instruction with fellow students, course activities, discussion session, and time spent on the examination or

course. Adequate computer literacy and well designed instruction on the use of computer based examination by students with initial knowledge about e- learning and computer based examination technology will in result give better understanding of computer or ICT education when used wisely, will help realize the goals, aims and objectives of ICT in education for effective teaching and learning in our educational sector.

The extend age group differences determine students' perception on the use of joint admission and matriculation board computer based examination; It revealed that differences exist on the account of age group of students' towards their perception on computer based examination, this findings is in conformity with Lenhart, Raine and Lewis (2001) whom state that 71% of American youth between the age of 12 to 17 years go online and there few statistical differences between the volume of boy versus girl internet use. This finding is supported by Cheong and Park (2003) reported that computer based examination had to impact institutions with faster quality and speed of feedback which could enhance the capability of academics to pinpoint progress and learning differences.

Hypotheses 3 revealed that there is no significant difference of respondents on the basis of educational qualifications obtained of their perception on the use of Joint Admission and Matriculation Board computer based examination in Nnamdi Azikiwe University, Awka. This agrees with the findings of Olubiyi, Ajadi, and Inegbedion (2010) whom found out that the differences in student's perception lies on reduction of examination malpractice, wide coverage of scheme of work, gender difference in the use of computer and lack of computer know how, students academic performance, age factor on the use IT resources or tools and inadequate facilities and equipment.

Muwanga-Zake (2006), evaluated the diagnostic value of computer assisted assessment in the process of teaching and learning. Result showed that learners improved due to self assessment and descriptive feedback which enabled them to diagnose and remedy mistakes themselves, through dialogue with or without assistance from the teachers. The free test atmosphere, instantaneous marking and diagnostic nature of test items supported self, diagnosis and led learners to request more testing, which ultimately increased competitiveness and excitement, especially when learners aware of improvement. In the case of teachers, they reflected that computer assisted assessment could show learners problems and styles of thinking and also can test large number of students in short time. It revealed that learners realized the usefulness of computer assisted assessment and criterion referencing as impacting successive learning performance. Moreover, computer based examination data could provide insight on teaching style and offers system approach to instructional problems.

This shows that the application of ICT or Computer technology resources in education will go a long way to improve the academic quality and performance of Nigerian schools, teachers and students in computerized examination and ICT in education. Hopefully we look forward to see computer based examination or ICT being applied at all levels of our national examination bodies.

CHAPTER FIVE

SUMMARY, RECOMMENDATIONS AND CONCLUSION

5.1 Introduction

This chapter presents the summary of the research work, it also contains conclusion, implication of the study, recommendation, limitations of the study and as well as suggestions for further Studies.

5.2 Summary

This study, assessment of students' perception of Joint Admission and Matriculation Board computer based examination in Nnamdi Azikiwe University Awka, Anambra State Nigeria. This study was carried out using all first undergraduate students in the faculty of education in Nnamdi Azikiwe University, Awka. It was structured into five chapters in order to effectively carry out this research. Chapter one presented the background of the study, the statement of problem, objectives of the study, research questions, research hypotheses formulated for the study, significance of the study and scope of the study.

Chapter two was a review of appropriate literatures in line with every research questions; useful information relevant to the study was generated from previous studies. The review of literature covered areas such as gender difference, students' general perception and factors that determine students on the use of computer based examination and various empirical studies of computer based examination were cited and acknowledged in the reference. This guided the focus of the researcher in the study.

Chapter three focuses on research methodology that is Expo- facto design, population (972) students, and sample size (274) students, the simple random sampling

technique was adopted with recommendation of Krijcie and Morgan (1970) in determining the sample size. The research instrument used was a thirty six (36) items questionnaire. Pilot study was conducted on 10 students with reliability coefficient (r) of 0.787 for section B; while section C is 0.797 finally section D gave 0.864. The instrument was administered to all first year undergraduate students of faculty of education in Nnamdi Azikiwe University, Awka. The percentage and frequency counts were used to interpret the demographic data of the study while the mean and standard deviation were also used to answer the research questions and the Mann Whitney test was used to answer hypothesis one and Kruskal – Wallis test were used to answer the hypotheses two and three and tested at 0.05 level of significance. The data collected were analyzed with the aid of SPSS computer package (20^{th}edition) respectively.

The study revealed that the general perception of students is that computer based examination was a concrete and rewarding experience and also was enjoyable than paper based examination. The factors that determine students' perception on the use of computer based examination, the study revealed that poor computer literacy and lack of a well designed examination instruction affect their perception on the use of computer based examination. The study revealed that significant difference exist between male and female respondents' on their perception of Joint Admission and Matriculation Board computer based examination in Nnamdi Azikiwe University, Awka. Also significant difference exists on the age group of respondents' perception on the use of Joint Admission and Matriculation Board computer based examination in Nnamdi Azikiwe University, Awka. That there is no significant difference of respondents' on the educational qualification

obtained towards their perception on the use of Joint Admission and Matriculation Board computer based examination in Nnamdi Azikiwe University, Awka.

Recommendations were made based on the objectives and findings of the study; it was recommended that students should be encouraged to improve their computer literacy so as to enhance their flexibility during the Joint Admission and Matriculation Board computer based examination. The authority of Federal Ministry of Education should totally eradicate the use of paper pencil examination to pave way for full implementation of computer based examination in Nigeria to key in the latest testing process. A conclusion was drawn that computer based examination will help to improve the Joint Admission and Matriculation Board external examinations in Nigeria.

5.3 Recommendations

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

1. There should be more computer and internet facilities to facilitate the use of the Joint Admission and Matriculation Board computer based examination.
2. Students should be encouraged at levels of education to improve their computer literacy so as to enhance their flexibility during the Joint Admission and Matriculation Board computer based examination.
3. The management of Joint Admission and Matriculation Board should employ more computer personnel and instructional designers to design and guide the students during computer based examination.
4. The Federal Ministry of Education should eradicate the use of manual, paper based examination to pave way for full implementation of computer based examination

in Nigeria, due to its many advantages to enhance modern and to compete with their counterpart across the globe.

5. There should be provision for instructional guide, online campaign and frequent ask question on Joint Admission and Matriculation Board website for students.
6. The management of Nnamdi Azikiwe University should design a functional computer based examination of different kinds of assessment for international best practices.

5.4 Conclusion

Students have good perception towards Joint Admission and Matriculation Board computer based examination in Nnamdi Azikiwe University Awka; so therefore they will accepts the new examination mode and will ready to use it. Problems of facilities, gender inequality, age and educational qualifications should be addressed on the use of Joint Admission and Matriculation Board computer based examination which will result of none full operational and implementation of the latest innovative testing techniques in the system its design to serve. The study revealed that no meaningful examination advancement can be made without putting to use, computer based examination technologies and ICT resources in teaching and learning at all levels. Our educational system, particularly in the areas of the instruction design, computer in education, gender equity, school age, qualification, educational resource centers/instructional materials and computer experts still lagging behind, as it relates to provision, supplies of instructional resources and students ICT proficiency development in Nigeria.

The importance of computer based examination as ICT application and implementation in education in our national examination development cannot be

overlooked by relevant stakeholders in the educational sector, because lack of necessary instructional resources for the operation of computer based examination at levels of our school system will certainly affects teaching and learning methodology versus assessment process, which will definitely in the later affect the academic perception, achievement and performance of Nigerian students (learners) in this informative age. From these conclusions of findings, it calls for the improvement of Joint Admission and Matriculation Board computer based examination to an advance level in Federal Republic of Nigeria.

5.5 Limitations of the Study

This study is limited to Nnamdi Azikiwe University, Awka and it covered only first year undergraduate of faculty of education with a number of 274 respondents. These limitations were preview of the perception of student's in Nnamdi Azikiwe University, Awka. With this it presupposes that the findings of this study will generalized in the university. Moreover the sample size used in this study was drawn from faculty of education of Nnamdi Azikiwe University only. Hence the study was design on students' perception of Joint Admission and Matriculation Board computer based examination. In view of this above, more academic scrutiny should be establish or the limitations of the study by improving the scope of the study to investigate on other faculties and higher institutions of learning in Nigeria.

5.6 Suggestions for Further Studies

More research studies should be conducted in the following areas:

1. Relationship between students and staff IT literacy level and the utilization of joint admission and matriculation board computer based examination in federal colleges of education in Nigeria.

2. Investigation of student's performance of joint admission and matriculation board computer based examination of federal universities in Nigeria.
3. An assessment of student's perception of joint admission and matriculation board computer based examination in other Nigerian universities.
4. Perception of university lecturers towards joint admission and matriculation board computer based examination in Anambra State, Nigeria.

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APPENDIX

I'm a researcher from Instructional technology section, Department of Educational Foundations And Curriculum, Ahmadu Bello University Zaria. I am conducting a study on Assessment of students' perception of joint admission and matriculation board computer based examination in Nnamdi Azikwe University Awka. You are request to respond to the research instrument as you demeed appropriate. Be assured that your response would be treated in confidence as this is for research purpose only. Thanks……...

Instruction

Please kindly assist me and tick or indicate your opinion or what you feel on student's perception on computer based examination.

Strongly agree – SA, Agree – A, Disagree – D, Strongly Disagree – SD

Section A: Demographic Data

Name:_____

Gender: Male ☐ Female ☐

Age: 16 – 20 ☐ 21 – 25 ☐ 26 – 30 ☐

Faculty:_____

Level of respondent:_____

Qualification

NABTEB ☐

NECO ☐

WAEC ☐

SECTION B

S/N	Perception of students on Computer based Examination	SA	A	D	SD
1.	The computer based examination was a concrete and rewarding experience.				
2.	I was satisfied with writing examination with computer.				
3.	The computer based examination was too difficult to answer				
4.	The computer based examination was disorganized in test administration centers'.				
5.	The computer based examination was efficient and effective for the conduct of examination.				
6.	Computer based examination was a positive way for immediate release of examination results.				
7.	Computer based examination consume a lot of examination time.				
8.	Computer based examination was conducted in a good e-classroom/Internet classroom for assessment of students.				
9.	The computer based examination was too wearisome				
10.	Computer based examination was enjoyable than paper based examination.				
11.	Computer based examination is more preferable than paper based examination.				
12.	Most computer based examination items and answers were blank and missing on the computer screen.				

SECTION C

S/N	Students gender difference on computer based examination	SA	A	D	SD
1.	Many students choose computer based examination over paper based examination.				
2.	Students see computer based examination as a form of programmed assessment with the aid of a computer and internet.				
3.	Students perceive computer based examination as a means of developing competence in computer education.				
4.	Do you feel students see computer based examination as what could give them much needed practical ICT skills.				
5.	The computer based examination was favorable to students.				
6.	Do you think that there is fairness in computer based examination.				
7.	Do students see computer based examination as a particular gender sphere.				
8.	All students posses strong attitude towards the development of practical ICT skills and compliance via computer based examination.				
9.	Do you believe equity is guaranteed in computer based examination.				
10.	Gender should not be regarded as an issue when considering computer based examination.				
11.	Females find it difficult to concentrate than males during computer based examination.				
12.	Females consider computer based examination to be more stressful.				
13.	Males prefer computer based examination to paper and pencil examination.				

SECTION D

S/N	The factors that Determines students' perception on the use of computer based examination.	SA	A	D	SD
1.	Poor computer literacy affect students perception in computer based examination.				
2.	Cost of buying personal computer influence students' choice/ perception on computer based examination.				
3.	Inadequate ICT manpower to man computer Influence student's perception on computer based examination.				
4.	Lack of enough examination time frames in computer based examination.				
5.	Lack of a well designed examination Instruction on the use of computer based examination.				
6.	There is deficiency in gender equity and perception in the use of computer based examination.				
7.	Insufficient e-classroom influence student's perception of computer based examination.				
8.	Epileptic power supply in our country hinders student's perception.				
9.	Poor ICT funding on the part of all levels of government and donor agencies influence students' perception of computer based examination				
10.	Ineffective ICT policy and Implementation from government affects students perception on computer based examination.				
11.	Lack of local computer literatures in the country				

Table for Determining Sample Size from a Given Population

N	S	N	S	N	S
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	911	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	446	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	228	7000	364
120	92	600	234	8000	36
130	97	650	242	9000	368
140	103	700	248	10000	370
150	106	750	254	15000	375
160	113	800	260	20000	377
170	123	900	296	40000	380
190	127	950'	274	50000	381
200 '	133	1000	278	75000	382
210	136	1100	285	100000	385

NOTE: N is population size, S is sample size.

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