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ASSESSMENT OF JAMB COMPUTER-BASED TEST (CBT) ON SS3 STUDENTS' ACADEMIC READINESS FOR UNIFIED TERTIARY MATRICULATION EXAMINATION IN FEDERAL GOVERNMENT COLLEGE JOS, PLATEAU STATE, NIGERIA

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ABSTRACT: The study assessed the JAMB Computer Based Test (CBT) academic readiness of final year students for 2019 Unified Tertiary Matriculation Examination (UTME) in Federal Government College, Jos, Plateau State, Nigeria. Two research questions and one hypothesis respectively guided the study. A descriptive survey design was employed to solicit the opinions of the respondents. The instrument used a closed ended questionnaire using a 20 item construct questionnaire in a 5-point Likert rating scale was administered to 156 respondents, spread across the four departments, randomly selected from a population of 250 students. The questionnaire was validated by three experts in English Language, Test and Measurement and ICT respectively from the Faculty of Education, University of Jos, Plateau State. The pilot testing using Cronbach Alpha method with internal consistency reliability index of 0.82 coefficient was obtained. The data collected was analyzed using percentage, mean, standard deviation and independent t-test aspect of the Statistical Packages for Social Sciences (SPSS) version 25. The results of the findings indicated that the students were academically ready for the 2019/2020 JAMB Computer Based Test UTME. The respondents were mainly located within the age bracket of 16-18 prescribed for admission into tertiary institutions. In consonance with these findings, the study recommended the need for more computer experts, adequate computers, internet connectivity and solar energy to avert epileptic power supply during examination to meet the demand of increased population. Massive training of students are also needed to create mass awareness of the recently introduced National Identification Card by JAMB for 2019/2020 UTME examination.

Keywords: ICT, CBT, JAMB, UTME, SS3 Students, PPT

I. INTRODUCTION

As an asset to every nation, education is the fulcrum for the development of skills, competence and imparting of knowledge needed to move the nation forward educationally and economically. It is argued that education powers other sectors of the economy, such that it is defined variously as all societal efforts directly or indirectly geared towards the achievement of laid down desirable objectives. New innovations are aiding people around the world in doing incredible things. Technology is one of the unlocking secrets of learning and reshaping education. Since the first IBM PC was sold in 1981 and the bundling of Microsoft's Windows Operating System became easy-to-use PCs, computers have revolutionized the way individuals, students and enterprises work, communicate, live, educate and entertain [1]. The use of computers are now integral part of human and non-human activity with its skills and literacy as a prerequisite for sound and effective teaching and learning, [2]), research and communication [3].

In recognition of this global function of Information and Communication Technology (ICT) in advancing effective knowledge and skills, the National Policy on Education [4] stipulates that:

... for effective functioning in a knowledge driven world, government shall provide adequate infrastructure and develop capacity for effective utilization of Information Technology (IT) to enhance the delivery of Basic Education in Nigeria (p.15).

In line with this outlined objective of ICT policy, the Junior secondary schools do undertake Computer Science as a subject and as component of the Junior Secondary School Examination Certificate (JSSCE) across the curriculum [3a]. Therefore, ICT assists in the formal process of making sure that an individual is qualified in terms of the knowledge and skills in any or combination of Word Processing, Spreadsheet, Presentation, programming, Web design, networking and social media skills [5]. ICT is therefore offered at the Post-Basic Education curriculum for the award of Senior School Certificate Examination (SSCE) in Nigeria [4].

Despite the current over 1.9 million candidates in Nigeriawho have so far registered for the ongoing 2019/2020 Unified Tertiary Matriculation Examination, (UTME) and the Direct Entry(DE), preparatory to seeking admission into various tertiary institutions in the country [6],ICTresources available do not commensurate with the number of students who are ready for the Unified Tertiary Matriculation Examination (UTME) including students withvisual impairment [3]. These ICT devices for persons with visual impairment include lack of speech recognition or text to speech software, refreshable braille displays which help them to use a mouse or speech-to-text technology to send signals to a computer via a straw device using air pressure by sipping and puffing [7], [8].These over 1.9million prospective candidates seeking admissions into tertiary education programmehad to go through the Joint Admissions and Matriculation Board (JAMB)which is an agency of the Federal government, empowered to conduct entrance examination into all universities, polytechnics and Colleges of Education (public and private) in Nigeria. The Joint Admissions and Matriculation Board (JAMB) in 2013, introduced the Computer-Based Testing (CBT) in the conduct of Unified Tertiary Matriculation Examination (UTME) in Nigeriawhich portends is to eliminate the use of pencil and papers as well as aiming at curbing examination malpracticduring the examinations [10]. The JAMB employed the use of Computer-Based Test (CBT) which is a viable alternative to paper-and-pencil testing(PPT)to administer the tests in a linear format because exams questions and answers which cannot be leaked, fast checking system, and students get to see their results earlier[9].[11] defined a linear CBT as a full- length examination in which the computer selects different questions for individuals without considering their performance level. Other terminologies used to describe Computer-Based Test (CBT) include Internet Based Test (IBT),Computer Assisted Testing (CAT), Computerized Assessment, Computer Aided Assessment (CAA), Computer Based Assessment (CBA), Online Assessment, Web-Based Assessment, Technology Enhanced Assessment, Automation Assessment, and E-Assessment where candidates sit in front of a laptop and the questions are presented on the computer monitor and the candidates submits the answers through the use of keyboard or mouse [12], [13].

II. LITERATURE REVIEW

This section reviews literature relevant to this topic under the following sub-headings: The Concept of Information and Communication Technology, Computer Based Test(CBT) and its benefits, gender disparity and the challenges of using ICT.

Generally, students learn best by doing using computer which enhance active class participation, class interaction,interaction with the instructor,increased learning by utilizing their senses of sight, hearing and touch on the computerinstead of listening [3]. [3]opined that students use computer to study in a more convenient and interactive way with immediate feedback. The correlation between feedback and improvement is indisputable. Consequently, computerand cloud technology have changed the way people store documents (cloud storage),the way people work, redefining our education, the ways of communication, new kind of habits and digital addictions, lifestyle, more health care, our critical thinking skills (what you search, where you click, what you buy, how you react to certain copywriter's text), way we do business, workplace productivity, behaviors and upgraded human greed, influencing youth, speed of time, our life positively and negatively[14]. Other benefits of ICT include less cost of travelling, improving the way we teach, learn, communicate, mode of writing, research, analyze data and make decision[3].

ICT isa critical component of human development indices and a key driver of economic and development of nations[15]. ICT has proven to be increasingly fundamental for social and economic development. Access to basic ICT infrastructure is a key to increasing the flow of information and improving communications and by extension increasing possibilities and opportunities. It has proven to be a great leveler between the developed and the developing countries of the world [16]. Recognizing the importance of ICT, the Geneva Action Plan of the World Summit of Information Submits(W SIS) that countries of the world should discuss and implement the opportunities of the new information and communication environment by connecting educational institutions at all levels with ICTs and to also address the challenges of inequality in access to information and communication that is called the 'digital divide,[17]. In line with these goals, the National Economic Empower and Development Strategies (NEEDS, 2005) was set to ensure that 80% of secondary school graduates are computer literate [18],[3].

Consequently, educational institutions in Nigeria have invested immensely in ICT because of its importance to teaching and learning outcomes. The students through interactive process are tutored using computers variously referred to as Computer Based Instruction (CBI), Computer Assisted Instruction (CAI), or Computer Assisted Learning (CAL) to increase skills and knowledge through stages of individualized learning materials, training and assessment; with the student working at his/her pace [19]. All in all, computers have become integral part of today's society, revolutionizing the way students learn, businesses operate and people relate with one another. The use of ICT will boost education, employment, engagement and entrepreneurship (4Es) skills development in Nigeria.

2.1 Advantages of JAMB CBT

[20] opined that examination body is often concern about accuracy, validity, security, integrity, and quality of online assessment of which CBT is known for: (1) **Multiple-Test Administrations**. Learners can take multiple, short, reliable assessments administered throughout the life of an e-learning program. (2) **Dynamic and Individualized Assessments**. Tests can be personalized and tailored to individual students. (3) **Immediate Grading**. This is the process where the computers select-response tests (like multiple choice or True/False) which can be scored instantly, allowing learners to instantly see how they perform on an assessment and online instructors to make real-time instructional changes based on assessment evidence. This immediate grading will free up instructors to focus on feedback, which is critical for learning and yet time consuming. (4) **CBT helps with open-ended assessments**. This is the use of rubrics which is extremely time-consuming to grade. However, the simple rubric extensions, like Orange Slice or Google Sheets add-ons can automate scoring of rubrics and communication to students thereby allowing instructors to spend more time on feedback to students. (5) **Feedback**. Voice feedback tools such as speech recognition and speech-to-text technology are utilized to send signals to a computer to allow instructors to provide voice feedback which makes feedback both easier for the teacher and more personalized for the learner. The application of these speech recognition, speech-to-text and video-based feedback software can provide students with individualized and personalized feedback on their performances. (6) **Vertically and Horizontally Aligned Assessments**. This is a sort of tests that anchored to test the same core knowledge at increasing levels of difficulty (criterion-based testing). They can also be horizontally aligned to score in such a way that learners can be compared against one another (norm-referenced), which is critical for sorting and choosing students for teaching posts, scholarships. (7) **Value-Added Growth Measures**. This is a type of tests that measure individual growth over time. The programs are able to benchmark where learners should be at the end of the year based on test results from the beginning of the year. (8) **Uncover Student Thinking**. These are games and branching scenarios that can help instructors "uncover" student thinking and measure higher-order thinking skills. (9) **Engaging**. This is the use of quiz-based video programs, videos and video-notation tools and branching scenarios that can make assessments more engaging than standard multiple-choice or essay tests. (10) **Analytics for the Instructor and Learner**. This is a back-end data from Learning Management Systems (LMSs), such as the number of log-ins, time on task, and number of discussion posts, can be linked to hard assessment data such as examinations or performance-based data to provide a fuller assessment of a learner's effort and progress in an online course. (11) **Greater Amount of Test Items**. This is so important for high-stakes assessments that determine whether or not a learner graduates, moves to the next level, or receives certification. (12) **CBT software**. These software such as screen readers, magnification tools, and text-to-voice or voice-to-text applications can help learners with visual, auditory, and motor impairments; learners with dyslexia; and learners who simply need more time to complete a test than with paper-based tests. (13) **Incorporate Computer-based or online assessments tools**. These types of tools offer a wealth of authentic assessment opportunities for online learners, both synchronous (on time) and asynchronous (not on time), Web-based and non-Web-based, and multiple platforms such as phone, tablet, and laptop. (14) **Improves Writing**. This is an extensive writing application software such as word processing or a digital writing tool that will enhance learners in putting forth a thesis statement, support their idea with evidence and come to a conclusion that CBT is better than writing by hand through the complete writing cycle of drafting, editing (using different font/colour), revising, and rewriting. (15) **Closed Circuit Television (CCTV)**. This is a secure testing tool that can prevent cheating in online and computer-based testing once students know that CCTV can expose them which is safer than paper-and-pencil testing. (16) **Plagiarism checkers**. These are software tools like Turnitin, Safe Exam Browser, Respondus, DyKnow, and Chrome browser testing apps like Edulastic can help to lock down browsers and make cheating more difficult.

Contributing, [21] explained the following as primary advantages of CBT: (a) **Efficiency**. It takes less time for teachers to prepare, distribute, and grade online tests compared to paper tests, (b) **Convenience**. Students can take the assessment at a convenient time and place where they choose, rather than having to take it at a fixed schedule, (c) **Automatic scoring with instant feedback**. A computer can automatically score the assessment and provide students with immediate feedback on their performance, (d) **Analytics and Reports**. The computer-based examination software enables the teacher to make data-driven decisions as it collects a

large amount of data that can help him identify who is having trouble and also improve the assessments over time, (e) **Security Configurations**. Online assessment creators have a variety of features to prevent cheating and unauthorized access, (f) **Less human error**. Computer-based assessment removes a significant amount of human error, such as marking and grading errors, (g) **Re-usability**. ICT creates tests and even individual questions once and reuse them easily on other assessments. (h) **Speed**. The use of CBT speeds up the release of results instantly.

2.2 Challenges of JAMB CBT.

Our experiences as examiners and invigilators of students at the University of Jos showed that despite the above numerous advantages of using CBT-UTME as a viable alternative tool for examinations, there are still several challenges confronting the effective administration of CBT-UTME examination ranging from mass failure because of incompetence in the use of computer, inadequate computers and epileptic power supply [3]. Most examination bodies such as West African Examination Council (WAEC), the National Examination Council of Nigeria (NECO) which was established in 1999 to compete with the WAEC, the National Business and Technical Examination Board (NABTEB), and Senior Secondary Certificate Examination (SSCE) are all characterized with fraudulent exam malpractice in centers which are designated as "Passing Centers". In such "Passing Centers", teachers connived with exam invigilators, parents and students engaging in cheating, stealing of question papers, impersonation, collusion with others with the intent to secure unfair advantage for self or for another [22]. [22], [23] pointed out that such agents of examination malpractice are involved in disturbance at examinations, misconduct during examination, failure to obey lawful orders of supervisors, collusion of invigilators in aiding and abetting the acts of result slip forgery, breach of duty, conspiracy in raising the standard of pass in the UTME in the relevant subjects of their choice. [23] explained that because of the principal challenges in the PPT which involve transporting materials, having to provide security for the materials, the cost of printing of exams scripts and question papers, incomplete printing, delay in arrival of materials have necessitated JAMB to migrate from the conventional Paper-Pencil Test (PPT) to a Computer-Based Test (CBT) method, and introduced bio-metrics techniques.

The study, having identified these drawbacks and challenges, seeks to examine the adequacy or inadequacy in readiness of the students of Federal Government College that will soon be exposed to the avarices encountered in the administration and management of the UTME. The Federal Government College, Jos is a micro-cosine of the nation with representative of every composite group in the nation. Most importantly, such assessment will go a long way in remedying the teaching-learning proficiency before the students partake of this examination.

2.3 Gender Disparity in the use of ICT

Studies have revealed that girls often exhibit difficulties with technology, because they have less childhood experience in playing with technological devices than boys [24]. This is manifested in the subject choices of girls in upper secondary education up to tertiary institution. These attitudes to technological education are reflected in report on gender disparity of 35% of females enrolled in Science, Technology, Engineering and Mathematics (STEM) and related field [17]. Affirming this stance, [25] are of the opinion that generally, women do not have strong influence in science and technology, with impact of gender inequality having negative consequences on gender gap, which hinder the improvement of female participation in ICT studies and career advances for women who lack the opportunity to discover their technological aptitude and may end up in less suited career. [26] opined that the already low number of female students studying ICT in secondary school tends to decrease further at tertiary level. This situation according to them has often been attributed to gender differences in interests, motivation, experience, personality characteristics, abilities, self-efficacy, and socialization. A report recently compiled by the European Schoolnet and CISCO Systems Inc indicated that, of female students across Britain, France, Italy, Poland, and the Netherlands who like studying ICT at high school, most fail to progress those studies to tertiary level or translate their computer competencies into ICT careers [27]. This high drop-out rate can be attributed to lack of support from role models, persistent stereotyped views that the sector is better suited to men, a lack of understanding about what ICT jobs entail, and in some cases, how easy or difficult they find the subject [27]. Because of the challenges mentioned in [27], [26] the increase in the number of women in technical careers has not yet been achieved in most countries all over the world [11]. [28] opined that technology is majorly associated with male dominance. The digital sector offers highly skilled, well-paid jobs but fails to attract and employ many women, [29]. [30] explained that women made up only 17.2% of the 1.4 million people who chose information and communication technologies in the EU in 2015 and only 16.7% of the nearly 8.2 million employed as ICT specialists in the EU in 2016. [31] stressed that Software development still seems to be (mostly) a male-dominated club. Over the past five years, almost 90% of downloads packages of one of the most used, "big data", open-source software packages were authored by men. This is particularly worrying, given the growing

importance of “big data” analytics to the digitaleconomy, and the possible consequences of unintended bias creeping in due to this marginal role of women. Only 9% of developers, and only 19% of people in management position of ICT sector are women [31]. Unfortunately, Women are still under-represented in this sector which make them less likely to take up studies in this field and are much less represented in the ICT job market. Furthermore, Women’s participation in the information society is constrained by two main factors: too many women face barriers to access and use digital technologies; and, underpinning this, too few women are involved in the design, development, production and governance of digital technologies [31]. Latest estimates from the ITU I 2017 suggest that women globally are 12% less likely to use the Internet [32]. A recent study according to Global System for Mobile Communications Association (GSMA) shows that in low- and middle-income countries, women are 26% less likely to use mobile internet than men, the primary means of accessing the internet in many parts of the world [32]. Women are also often under-represented at senior levels in high-technology industries including the digital sector and there is a substantial gender gap, in both developed and developing countries, in skills, jobs and careers involving science, technology, engineering and mathematics (STEM subjects) [33]. This gender bias begins in primary school and the pattern continues into higher education choices and the workplacemaking women less certain of their mastery over them [34]. On the other hand, a fundamental part of social competence is skill in communication of which female students are skillful in decoding verbal cues more often than males [34]. In Nigeria, [35] confirmed that the challenges experienced during 2018 CBT/JAMB examination cut across board, irrespective of gender disparity. Thus, the study sought to fill the gap by finding out if there exist gender disparities in the students’ readiness of Federal Government College, Jos- one of the Unity Schools funded by the Federal Government for the same examination, and if the students finished their Post primary education at the prescribed age of 16 years in preparation for admission into Tertiary institutions.

2 Statement of the Problem

The occurrence of examination malpractice at any level of education possess the greatest threat to the authenticity, validity, reliability, and recognition of such certificate issued. Before 2013, the administration of examinations into tertiary education institutions in Nigeria has been the traditional paper and pencil test (PPT) form. Since 2013 Joint Admission Matriculation Board (JAMB) has introduced the computer-based testing (CBT) form of UTME with the objective of eliminating all forms of examination malpractice and promote the use of electronic testing in Nigeria [10]. JAMB has approved 692 centers across the six geo-political zones of Nigeria for students to write their 2019/2020 admission examination into the Universities of their choice. According to [36], the minimum JAMB cut off mark for Universities has been 180 depending on the course applied for and Polytechnics and Colleges of Education that have 160 as its cutoff point out of 400. This will show the type of readiness and acceptability of candidates on Computer-Based Test (CBT) for Post-University Matriculation Examinations [37].

Dissatisfied with the minimum cutoff point of 180, there has been agitations and pressures from parents and candidates on JAMB to reduce the cut off mark for Universities UTME admission for 2020/2021 to **160** and for **120** for Polytechnics and College of Education for the advantage to candidates with low JAMB scores [36]. Other challenges associated with the administration of the UTME exams are characterized with ineffective use of ICT skills/facilities by students from rural areas and disabled students, power failure, poor internet connectivity, inadequate computers for integration of CBT [8] which may hamper the pursuit of their careers.

It has become a prolific business enterprise branded with the name of private examination centres aided and abetted by corrupt examination officials, supported by parents who will not allow their children to be left out from the Trojan gift of malpractice. To reduce or eliminate malpractice in the conduct of examination, some centres were linked to the CCTV with staff, candidates and supervisors in all examination centres are being watched and recorded [38]. Digital technologies have become a powerful force for social and economic development, delivering substantial benefits for both, individuals and society, yet, there remains a significant digital gender gap which must be addressed to ensure that women are not being left behind [32].

Although JAMB’s CBT has come to stay and has been tacitly supported by government, it is necessary to find out the extent to which senior secondary school students accept this innovation in the Nigerian education system. Hence, the purpose of this study was to identify variables such as students’ academic readiness to the use of JAMB CBT, and gender disparities of the students’ academic readiness to the use of JAMB Computer-based Test for UTME in Federal Government College Jos, Plateau State, Nigeria.

Purpose of Study

The purpose of the study is to assess JAMB Computer Based Test on Senior Secondary three students’ academic readiness for UTME in gaining admission into Nigeria tertiary institutions. The study will specifically address the following objectives:

- a. To determine the age gender disparities of students' academic readiness to the use of JAMB Computer Based Test for UTME.
- b. To ascertain the students' academic readiness to the use of JAMB Computer Based Test (CBT) for Unified Tertiary Matriculation Examination (UTME).

Research Questions

In line with the purpose of the study, the following research questions were posed to guide the study.

- a. What is the age disparities of students' academic readiness to the use of JAMB Computer Based Test for UTME?
- b. What is the students' academic readiness to the use of JAMB Computer Based Test for Unified Tertiary Matriculation Examination(UTME)?

Hypothesis

The study is guided by this hypothesis and it is tested at 0.05 level of significant.

H₀¹ There is no significant difference between male and female students mean scores on their academic readiness for the use of Computer Based Test for UTME

III. RESEARCH METHOD

Research Design

This study adopted a survey descriptive design aimed at assessing the JAMB Computer-Based Test (CBT) on final year students' academic readiness for Unified Tertiary Matriculation Examination(UTME) in Federal Government College Jos, Plateau State. Survey research was used to solicit the opinions, views and attitudes of the final year students on their academic readiness of JAMB Computer-Based Test (CBT).

Population and Sample

The population comprised of 250 final year students of Federal Government College, Jos, from which a sample of 156 students, cutting across the four departments of: Arts, Social Science, technical and Science, were randomly selected for the administration of the Students' Academic Readiness Questionnaire (SARQ).

Research Instrument

The data for this study was collected using a self-developed instrument, Students' Academic Readiness Questionnaire (SARQ) divided into two sections: Section A elicited response from the respondents' bio-data, while Section B comprised of 20 items, devoted to issues that are fundamental to the study, with 5 point Likert Rating Scale: Strongly Agree (SA)=5, Agree (A)=4, Undecided (U)=3, Disagree (D)=2, and Strongly Disagree (SD)=1.

Validity and Reliability of the Instrument

The Students' Academic Readiness Questionnaire (SARQ) was scrutinized for face and content validity by experts in English Language, Test and Measurement and ICT from the Faculty of Education, University of Jos and Head of ICT Department, Federal Government College Jos. This was to ensure clarity and appropriateness of the test items, and relevance with respect to specific objectives of the study.

The reliability of the instrument was obtained through a pilot test and re-test from two Government Secondary Schools, Jos. The pilot study was first administered to the two schools and within two weeks the second test was also administered to them. The internal consistency of 0.82 of reliability index was obtained using the Cronbach Alpha method. Based on the experts' comments, necessary corrections and modifications were effected on the instrument for ease of understanding.

Procedure for Data Collection

The instrument known as, Students' Academic Readiness Questionnaire (SARQ) was used for data collection. The Students questionnaire was administered to the respondents and collected with the aid of three teachers from the ICT Department of Federal Government College, Jos with a recorded return rate of 100% success.

Procedure for Data Analysis

The data collected from the two research questionnaire were subjected to frequency and percentage aspect of Statistical Packages for Social Sciences (SPSS) version 25 in a tabular format. Frequency Tables are useful for describing the number of occurrences of a particular type of datum within a dataset as well as comparing data sets of the same type (gender disparity). The hypothesis was equally subjected to mean and

standard deviation aspect of the same SPSS version 25. The researchers are interested in the mean and standard deviation to summarize continuous data.

IV. RESULTS AND DISCUSSION

Research Question 1: What is the age disparities of students' academic readiness to the use of JAMB Computer Based Test for UTME?

Table 1: The age range differences of the respondents

| Age range | | | | | |
|--------------------|-----------|---------|---------------|-----------|--|
| Age Range | Frequency | Percent | Valid Percent | C/Percent | |
| 13-15 years | 23 | 14.7 | 14.7 | 14.7 | |
| 16-18 years | 129 | 82.7 | 82.7 | 97.4 | |
| 19-21 years | 2 | 1.3 | 1.3 | 98.7 | |
| 22-24 years | 1 | 0.6 | 0.6 | 99.4 | |
| 25 years and Above | 1 | 0.6 | 0.6 | 100.0 | |
| Total | 156 | 100 | 100 | | |

Source: Researchers' Field Survey, 2020

The result in Table 1 above revealed that there exist a high percentage of 129(82.7%) of respondents within the age range of 16 to 18 years. Students within this age bracket of 16-18 years are the prescribed age range of admission into tertiary institutions which was also closely followed by the age range of 23(14.7%) for 13 to 15 years. These age ranges are outside the prescribed admission age. However, only exceptional students who scored very high (200 plus) above the cut-off point of 180 would get admission into universities of their choice.

Research Question 2: What is the students' academic readiness to the use of JAMB Computer Based Test for Unified Tertiary Matriculation Examination (UTME)?

Table 2: Students' academic readiness for 2019/2020 JAMB Computer-Based Test Unified Tertiary Matriculation Examination (UTME).

| S/N | Items | N | X | Std. | Decision |
|-----|------------------------------------------------------------------------------------------------------------------------------------|-----|------|-------|----------|
| 1 | I am aware that Computer Based Test (CBT) is an electronic process through which JAMB administer UTME using internet | 156 | 4.67 | 0.510 | Accepted |
| 2 | I am comfortable with the process of JAMB registration for UTME | 156 | 3.80 | 1.104 | Accepted |
| 3 | It is easy to login and work at my pace with Computer Based Test (CBT) | 156 | 3.63 | 1.072 | Accepted |
| 4 | It will take me less time to complete CBT examination. | 156 | 3.57 | 1.208 | Accepted |
| 5 | A Computer Based Test (CBT) is easier to complete than the Paper and Pen examination. | 156 | 3.88 | 1.215 | Accepted |
| 6 | Computer Based Test (CBT) favours students with knowledge of computer skills. | 156 | 4.30 | 1.037 | Accepted |
| 7 | There are still disparity, discrimination and under-representation of girls in the use of ICT resources | 156 | 2.68 | 1.218 | Rejected |
| 8 | I am aware of the use of Close Circuit Camera Television (CCTV), plagiarism checkers in preventing cheating in online examination. | 156 | 4.19 | 1.146 | Accepted |
| 9 | Computer Based Test (CBT) curb examination malpractices and enhance the integrity, credibility, validity and security of UTME. | 156 | 4.07 | 1.078 | Accepted |
| 10 | I still prefer the Conventional Paper and Pen examination to CBT | 156 | 2.88 | 1.429 | Rejected |

| | | | | | |
|----|------------------------------------------------------------------------------------------------------|-----|------|-------|----------|
| 11 | I am afraid that power interruption and internet connectivity will affect my success with CBT | 156 | 4.21 | 1.088 | Accepted |
| 12 | The invigilators not being computer literate will affect my success. | 156 | 4.06 | 1.088 | Accepted |
| 13 | The CBT examinations are stressful because of poor management of the CBT centers. | 156 | 3.90 | 1.108 | Accepted |
| 14 | To improve CBT, there is need for students' orientation on CBT before UTME examination. | 156 | 4.74 | 0.634 | Accepted |
| 15 | I want Test drive video tutorials for students' practice before the UTME examination. | 156 | 4.62 | 0.765 | Accepted |
| 16 | I will need to know the experiences of other candidates that sat for UTME using CBT. | 156 | 4.54 | 0.713 | Accepted |
| 17 | I will want ICT training for students and JAMB staff. | 156 | 4.66 | 0.677 | Accepted |
| 18 | I will want improvement in JAMB/CBT centers with adequate electricity by having stand-by generators. | 156 | 4.75 | 0.552 | Accepted |
| 19 | I am excited at the speed of getting my result from JAMB after taking my UTME examination. | 156 | 4.48 | 0.774 | Accepted |
| 20 | I can attempt UTME using CBT. | 156 | 4.26 | 0.895 | Accepted |

Source: Researchers' Field Survey, 2020

The results in Table 2 Serial Nos. 1,2,3,4,5,6,8,9,11,12,13,14,15,16,17,18,19,20 indicated that the mean scores responses of the students were more than the average of 3.0. This shows that the final year students were academically ready for the 2019/2020 JAMB Computer-Based Test(CBT). This is because the CBT was easy to login and enabled them to work at their own pace. This result is in line with [19] that CBT is an easy and interactive process, tutored to increase students' skills and knowledge through stages of individualized learning materials with students working at their own pace. Similarly, the result supports [21] that CBT is efficient which takes students less time and easier to complete their examination on time. This means that the use of CBT skills and literacy have become an integral part of human and non-human activity. This process is a prerequisite for sound and effective teaching and learning, research and communication which concurs with the findings of [20],[2],[3],[4],[5], [19].

The results also showed that students were ready and aware of the function of Closed Circuit Television (CCTV) and Plagiarism checkers software like Turnitin, Safe Exam Browser, Respondus, DyKnow that are meant to expose and prevent them from cheating in an online examination. These are software used in curbing examination malpractices, making cheating more difficult for students [10]. The availability and use of such software tend to enhance the integrity, credibility, validity and security of the UTME CBT examination results which is in line with [20],[38].

The result in Table 2, Serial No.11 indicated that students were fully ready for CBT examination but were afraid that power failure, poor internet connectivity and inadequate computers, cost of ICT infrastructure will affect their success with CBT which is in line with [8], [23]. Similarly, brilliant students were fully ready for CBT examination. But they expressed worry that invigilators and JAMB officials who connived with other students and parents at a "Passing Centers" to cheat during examinations would score higher marks than them. This finding is in line with [22],[23] that such "Passing Centers" are involved in disturbance, misconduct, failure to obey lawful orders of supervisors, collusion with invigilators in aiding and abetting the acts of result slip forgery, breach of duty and conspiracy which will affect their success during CBT examinations.

In the same vein, students were excited because of the speed of computer and so were fully ready for CBT examinations. This result supports [14],[32] that the speed of time of digital technologies have become a powerful force for social and economic development, delivering substantial benefits for both male and female ensuring that no one is left behind.

On the other hand, the mean scores in Serial Nos, 7 and 10 were below the benchmark of 3.0 (2.68 and 2.88). Such lower scores occurred as a result of disparity, discrimination and under-representation of girls in the

use of ICT resources which tend to cut across male and female students. This result is in line with [17],[25],[35] findings that women do not have strong influence in science and technology because of gender disparity, cultural and social discrimination which is believed to be male domain and so failed to attract and employ many women [28],[29].

Hypothesis 1: There is no significant difference between the male and female students mean scores on their academic readiness for the use of Computer Based Test for UTME.

Table 3: T-test result of the difference in mean rating of Male and Female Respondents

| Gender | N | X | SD | Sig. | T cal | df | T tab. | Decision |
|--------|----|-------|------|------|-------|-----|--------|----------|
| Male | 81 | 87.07 | 6.95 | .059 | -2.52 | 154 | 1.98 | Accepted |
| Female | 75 | 89.65 | 5.72 | | | | | |

Source: Researchers' Field Survey, 2020

The results in Table 1 showed that at 5% level of significance with 154 degree of freedom, the calculated t-value of -2.52 is less than the table value of 1.98. Hence, the null hypothesis is rejected. This means that gender has significant effects on male and female academic readiness for 2019/2020 JAMB/CBT for UTME. The implication is that male students tend to be more ready than their female counterparts. This finding supports [17],[25],[28], [29],[35] that many female generally do not have strong background and role models in science and technology right from their earlier years of education because of gender disparity, cultural and social discrimination which was believed to be male domain and so failed to attract many of them even in employment in ICT sectors. This gender bias began in primary school, it continued into higher education and the workplacemaking women less certain of their mastery [34]. Globally, fewer women who made it in life only 17.2% chose ICT in the EU in 2015 and only 16.7% of them were employed as ICT specialists in the EU in 2016 [30]. This is also in line with [31],[32] due to barriers to access and use of Internet and two few women were involved in the design, development, production and governance of digital technologies. As such, only 9% of them are ICT developers, only 19% in management position of ICT sector and women globally are 12% less likely to use the Internet and much less represented in the ICT job market [31],[32].

Summary of Findings

This research is focused on assessment of JAMB computer-based test (CBT) on SS3 students' academic readiness for Unified Tertiary Matriculation Examination (UTME) in Federal Government College Jos, Plateau State, Nigeria. Technological innovations can contribute to greater production, safer jobs, new and more customized goods and services among boys and girls. The findings revealed that CBT is widening the horizon of technology as the huge investment in setting ICT laboratories. Equally, JAMB regulations, provisions and monitoring are defying gender barriers due to gender stereotypic behavior, culture, social, attitudinal behaviour and divergent socio-economic backgrounds of the parents that affect students' progress. The study finds that students are affected by lack of ICT resources, Internet connectivity, epileptic supply of electricity. Intervention in terms of training and retraining of both male and female in the use of ICT to improve their proficiency in using ICT in the classrooms is highly recommended. The stereotypical perceptions associated with ICT is a big stumbling block for girls and boys made them become reluctant to follow a career in ICT.

Recommendations

The following recommendations are proffered for improvement in the use of CBT and JAMB administration:

- There is need to create mass awareness of the recently introduced National Identification Card by JAMB for 2019/2020 UTME of which majority of the students claimed ignorance of such existence.
- With the growth in the number of population of students, more ICT facilities are needed in schools to meet the CBT JAMB demand.
- Large scale renewable power energy, such as solar energy can be explored as alternative source of energy in powering examination centers. This will reduce cost of running generators in the face of epileptic power supply.
- To bridge the digital gender gap, the integration of a gender perspective into relevant policies and strategies to address women's needs, circumstances, capabilities and preferences are essential.
- There should be a synergy among the Federal Government and private organizations, women organizations and international communities to address issues of gender equality and social norms, as well as focusing on accessibility, affordability, safety, usability and training of digital skills, and the availability of relevant content, applications and services.

- f. To successfully coordinate action by many different stakeholders working together to address the digital gender gap, governments should ensure that indicators to measure access and use of technologies from a gender perspective are integrated into existing official data collection mechanisms in accordance with international guidelines, openly accessible and undertaken in a manner that enables regular comparisons over time and between countries.
- g. There should be strategies to measure the representation of women in ICT, vocational schools and universities related with STEM careers.
- h. Federal Government of Nigeria should support robust, reliable, accurate and up-to-date research concerning women and girls' access and use of technology and participation in the digital teaching and learning taking care of their cultural and social norms.
- i. As a matter of priority specific recommendations should include making sure gender equality targets are included across all ICT/broadband and related strategies, policies, plans and budgets, to ensure they support women and girls' access and use of the internet services
- j. Federal Government of Nigeria should address the root causes of digital gender gap which lie in a complex set of interrelated social, economic and cultural barriers, including lack of available infrastructure, the cost of the internet, devices and usage, the design and usability of devices, the lack of digital skills; concerns related to safety and security, the lack of awareness and relevant content, and cultural factors that impact women's ability to access and use digital technologies and participate fully in the digital sector.
- k. Federal Government of Nigeria should ensure that appropriate policy and regulation to reduce cost of devices and services: Implement policy and regulatory measures to help ensure that providers can offer data and devices for accessing the internet at prices that are affordable to women and girls, particularly for those with lower incomes.
- l. For adequate accessibility to ICT resources, grant equal and non-discriminatory access to digital technologies, ensuring sufficient and functional wireless networks are available and functional to all society, in rural and urban areas, taking into consideration the different needs and possibilities of the population by age, gender, and economic status
- m. To ensure maximum digital skills and confidence, teachers, educators and other local leaders must be trained to use digital tools and understand the benefits of delivering digital skills training to women and girls in their communities.

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