Perceived Effectiveness of Computer – Based Test (Cbt) Mode of Examination Among Undergraduate Students in South-Western Nigeria

Monsurat, Abiodun Shobayo Ph.D., Adeyemi, Olukayode Binuyo Ph.D., Ronke, Ogunmakin, Ph.D., Gbolagade, Ramon Olosunde Ph.D.,

Department of Educational Foundations, Faculty of Education, Ajayi Crowther University, Oyo, Oyo State.
Department of Mathematical Sciences, Faculty of Natural Sciences, Ajayi Crowther University, Oyo, Oyo State.
Department of Science Education, Faculty of Education, Ajayi Crowther University, Oyo, Oyo State.
*Corresponding author: e-mail: ma.shobayo@acu.edu.ng

ABSTRACT

The study investigated the perceived effectiveness of computer–based test (CBT) mode among undergraduate students in Southwestern Nigeria. This was done in relation to whether undergraduate students had positive or negative experiences when using Computer-Based Test (CBT) mode of examination, how effective is Computer-based Test (CBT) mode of examination from undergraduate students' perceptive, what are the challenges experienced by the students' during the conduct of Computer-based Test (CBT) mode of examination as well as what are the benefits in the continuous use of the Computer Based Test. The study adopted descriptive survey design. The sample size comprised 800 undergraduate students selected across private universities faculties using stratified sampling technique. A questionnaire titled CBT mode of examination Questionnaire (CBTMEQ) was used to collect data for the study. Percentages and frequency, ranking and Relative Significant Index (RSI) were used to analyse the data. The results showed that the students' experience in the use of CBT was positive, that CBT mode of examination is perceived effective. The results also showed that insufficient CBT centres, interrupted power supply during CBT examination, irregular time-table for CBT examination, and insufficient ICT officers are challenges militating against CBT examination. It was also found that CBT reduces the amount of printing question papers and answer booklets, saves time and manpower for the test administration. The study therefore concludes that students considered the use of CBT mode of examination in the university as effective and therefore recommends continuous use of the CBT mode of examination for students and adequate provision of ICT infrastructure facilities by the university management.

Keywords: Examination, Undergraduate Students, University, Technology, Computer Based Test

Introduction

Educational system in Nigeria has been conducting pen to paper-based examination for a long time but not without some demerits, among which are examination malpractice, missing results and analysis scripts, subjective marking style such as prejudice. During the past few years, technology has significantly reshaped the method of assessing and examining undergraduate students in their various courses of study. Technology has helped us in so many ways and one of the ways the technology has helped us is in the assessment of students' learning outcome with the use of Computer Based Test (CBT). CBT is a form of Electronic Examination that is used to examine students at some specific levels of the University. It is a more refined means of examination used in place of the usual pen to paper method. Moreover, computer-based test is an assessment of students with the use of computer and the internet or intranet as the case may be as an alternative method to pen to paper. Al-Amri (2009) conceptualized computer-based testing as the use of computer to administer a conventional (paper-and-pencil) test. Computer-based examinations are forms of assessment in which the computer is an integral part of question papers' delivery, response storage, making of response or reporting of results from a test or exercise (Whittington, Bull & Danson, 2000)

Daramola (2017) explained that computer-based examination requires a system of interconnected computer networks with the Standard Internet Protocol Suite (SIPS) to serve the user. This examination can be delivered online via the internet or using specific computer systems to answer questions presented on the monitor. The test taker submits the answer using keyboard or a mouse. Benefits of CBT have been identified by different researchers. For instance, Smither, Walker, and Yap (2004) identified enhancement of speed of delivery, administration and scoring efficiency, improved test security, consistency and reliability, faster response rate among others. CBT provides positive interactions or communication opportunities and immediate feedback to students (Daniels & Gierl, 2017).

Researchers (Aduwa-Ogiegbaen & Iyamu, 2005; Saad, 2009; Chua & Don, 2013; Abubakar & Abdullahi, 2020) found that computers and the internet had improved the proficiency and effectiveness of the evaluation process of education at all levels. Similarly, Bodmann and Robinson, (2004) viewed that technology-based assessment provide opportunities to measure complex form of knowledge and reasoning otherwise impossible through traditional methods. Moreover, the conduct of examination is pivotal to the assessment of students' understanding of the courses of learning at all levels of education from primary to secondary education. The performance of students however determines whether they are promoted to next level or not. There are various modes of administering examination: oral examination, written or paper-based. The most recent addition to mode of conducting examination is computer-based examination (Daramola, 2017). The advent of this was a breakthrough experienced in technological advancement globally. Each of this mode of examination however, has it inherent merits and demerits, nevertheless, the succeeding ones come along to correct the errors of the preceding. Computer-based mode of assessment has also been adopted by several Universities in Nigeria. One of the significant events that culminate the introduction of CBT in our institutions was the outbreak of the COVID-19 pandemic in the year 2020. The restriction of movement compelled the higher institutions of learning across the nation to seek for an alternative and more friendly means of conducting their educational businesses.

Studies (Al-Amri, 2009; Chua & Don, 2013; Olafare & Boor Charity, 2018; Abubakar & Abdullahi, 2020) have shown that CBT mode of examination has many advantages over traditional paper and pencil-based tests among which are improvement in students' skills, enhancing student's integrity, cost-effective, time-effective, enhancing speed of delivery, administration and scoring efficiency, improved test security, consistency and reliability, faster response rate. Other benefits include large scale delivery of tests; adjustable and personalized tests; well organized and smooth process CBT mode of examination is accuracy, consistency and reliability of results. It also provides uniformly precise scores for test-takers; test takers can edit their answers on screen during the exam without wasting ink or paper. A similar study conducted by Aduwa-Ogiegbaen and Iyamu (2005) on online examination practices in vocational education and training found that students perceive online assessment as a flexible and efficient means of conducting examination with immediate feedback. While the aforementioned benefits of the use of CBT seem to have emanated from the perspectives of examiners however, little is known about assessment of CBT mode of examination from test takers' experience (students). This therefore necessitated the need to access the effectiveness of computer-based text for the conduct of undergraduate examination in the university.

Statement of the Problem

Computer and related technologies provide powerful tools to meet the new challenges of examining and assessing the undergraduate students beyond conventional practices. CBT mode of examination provides opportunities to measure complex form of knowledge and reasoning that are not possible to engage and assess via the traditional methods. One of the major problems confronting the use of CBT mode of examination among undergraduate students in Nigeria especially after the post-Covid 19 era has been traced to poor power supply, inadequate ICT infrastructure, technical problems, improper utilization of computer system and factors related to getting suitable, software poor standardized based assessment development mode as challenges to the success of e-examination.

Moreover, the online assessment may not be effective for evaluating creativity, problem solving ability, critical thinking reflection or authentic

learning in which most of the studies had been extensively researched. The present study examined undergraduate students experience when using Computer based Test (CBT), how effective is Computer based Test (CBT) mode of examination from undergraduate students 'perceptive, the challenges experienced by the students' during the conduct of CBT and determine the numerous benefits in the continuous use of CBT mode of undergraduate students in South- Western Nigeria at the new normal Era.

Purpose of the study

The main purpose of this study is to assess perceived effectiveness of computer-based test (CBT) mode of examination among undergraduate students in South-Western Nigeria. The specific purposes of the study are to:

1) examine the undergraduate students' experience in Computer-based Test (CBT) mode of examination in Southwestern Nigeria
2) examine the effectiveness of Computer-based Test (CBT) mode of examination from undergraduate students' perceptive
3) identify the challenges experienced by the students' during the conduct of Computer-based Test (CBT) mode of examination
4) identify the benefits in the continuous use of the Computer Based Test.

Research questions

The following are the research questions of the study:

1. what are the undergraduate student's experiences when using Computer-Based Test (CBT) mode of examination?
2. how effective is Computer-based Test (CBT) mode of examination from undergraduate students' perceptive?
3. what are the challenges experienced by the students' during the conduct of Computer-based Test (CBT) mode of examination?
4. what are the benefits in the continuous use of the Computer Based Test?

Review Of Related Literature

Concept of Computer Based Test

CBT may be defined as a way of using a computer to give exactly the same test as one in a paper-and-pencil format. It may also be described as a method of administering tests in which the responses are electronically recorded, assessed or both. Conole and Warburton (2005) defined CBT as 'the use of computers for assessing students' learning'. It is required to think, re-consider, and modify or change the traditional test manners. Electronic assessment tools had reduced the load of teachers and facilitate exams execution purposefully because of inclusion of ICTs in education.

According to Williams (2007) computer-based examination requires a system of interconnected computer networks that the Standard Internet Protocol Suite (SIPS) to serve the users. Daramola (2017) stated that Computer systems which are used for CBT are made of two major components for them to carry out their functions as delivering examination questions they help to store examination questions and allow students to access them. The two parts are hardware and software. Computer hardware refers to the physical components of the computer i.e., the aspect of computer that can be seen, touched and felt while software refers to the set of instructions that are fed into the system which enable the computer to process information or data, and these are application software.

Alabi, Isaa, and Oyekunle, (2012) argued that CBT gives chances to gauge complex type of learning and thinking that is impractical to connect with and survey through conventional strategies. Computer based testing can encourage the improvement of more legitimate evaluations. CBT has the possibilities of guaranteeing viability and effectiveness in instructing, proficient advancement, certainty and direct criticism. Computer have changed the way we work, be it any calling (Jamil, Tariq & Shami, 2012).

Students' Experience in Computer-Based Test (CBT) Mode of Examination in South-Western Nigeria

Jimoh, Yussuff, Akanmu, Enikuomehin and Salman (2013) found that students have positive experience as they prefer computer – based test system better in writing their examinations than paper – based test. Fluck, pullen and Haper (2009) revealed that computer – based test is easy to use for students as the features of computer – based test make it go beyond conventional practices and features. In Saad's (2009) study, respondents admitted 'CBT exam was a positive experience'. Similarly, study conducted by Telia and Bashorun (2012) indicated positive experience towards CBT among university undergraduate students in Ilorin. The result shown students preference for CBT over PPT.

Olafare, Sabainan Christopher and Anne (2017) conducted research on student's perception of Computer – Based Test in Nigerian universities and their result revealed that computer – based test mode of examination is effectives because students perceived computer – based test as useful. Aojula, Barber, Cullen and Andrews (2006) also reported that CBT is effective as it increases student computer knowledge. Similarly, Jimoh, Yussuff, et al (2013) revealed that students found computer – based test system better in writing their exams than the paper pen testing.

Challenges Experienced by the Students' During the Conduct of Computer-based Test (CBT) Mode of Examination in South-Western Nigeria

Wordu, Olutimilehin, and Kelechi, (2020) identified inadequate ICT infrastructure, poor power supply, students' inadequate skills in ICT as challenges experienced by students during the conduct of computer-based mode of examination. Azor and Ogwu, (2019) opined that weak network connection, poor power supply and computer illiteracy by students as challenges in using computer-based test. Fagbola, Adiguu, and Oke (2013) identified poor standardized computer-based assessment development model as challenges to the success of e-examination. Fluck, Pullen and Harper (2009) opinioned that online assessment may not be effective for evaluating creativity, problem solving ability, critical thinking, reflection" or authentic learning; collectively the characteristics of deep and effective learning. Inadequate ICT infrastructure including hardware, software and bandwidth accessibility.

Oye, Salleh and Iahad (2011) stated that the challenge of erratic power supply in Nigeria has defied all attempts by various governments. Irregular and frequent interrupted power supply in Nigeria is a perennial problem affecting every aspect of the economy including education. Ilesanmi and Lasisi (2015) stated that Nigeria does not just need ICT foundation; it likewise did not have the human abilities and information to completely coordinate ICT into auxiliary school training.

Benefits of CBT Over Pen and Paper

There are several benefits in the continuous use of the Computer Based Test. For instance, Walker and Delius (2004) identified speed of delivery, administration and scoring efficiency, improved test security, consistency and reliability, faster response rate among others are benefits of CBT over traditional paper-and-pencil. Also, Boeve Meijer, Albers, Beetsma, and Bosker (2015) argued that computed based mode of examination is cost-effective, and the availability of powerful computers in educational contexts make computer-based test delivery both feasible and attractive. Daniels and Gierl (2017), identified that computer-based testing (CBT) provides interactions or communication opportunities and immediate feedback in educational contexts.

Methodology

The study adopted a descriptive survey research design. The population of the study comprised all undergraduate students in private Universities in southwestern Nigeria. There are six states that make up Southwestern Nigeria. These states are Ekiti, Ogun, Ondo, Osun, Oyo, and Lagos. Four states were randomly selected to participate in the study while 200 students were selected from each of the state. The total sample size of students that participated in the study was 800. Gender: male (39.2%), female (60.8%). Instrument used to collect data for this study is a questionnaire titled: CBT mode of examination Questionnaire (CBTMEQ). This instrument was a researcher-designed instrument. The items on the instrument were developed after an extensive review of literature in the related studies. The CBTMEQ consisted of five sections. Section A contains items on socio-demographic data of the students. Section B comprised twelve (12) items that addressed students experience in CBT mode of examination. Section C comprised nine (9) items that measured effectiveness of CBT mode examination from students perceptive. Section D contained ten (10) items that addressed challenges experienced by the students' during the conduct of Computer-based Test (CBT) mode of examination. Section E contained ten (10) items that contained benefits or improvement in the continuous use of the Computer Based Test (CBT) mode of examination. The instrument was validated before its use. To determine the reliability of the instrument, 40 copies of the instrument were administered on students outside the locale of this study. Their responses to the instrument were scored and data generated was subjected to reliability test via, internal consistency approach based on Cronbach's Alpha. The Cronbach's Alpha reliability coefficient values for instrument (CBTMEQ) **yielded 0.**82 **value**. The data collected from student's responses were analysed

using descriptive analysis of frequency and percentage, and Relative Significance Index (RSI) statistical technique via SPSS version 21.

Research Question 1: What are the undergraduate student's experiences when using Computer-Based Test (CBT) mode of examination?

Results

Table 1: Descriptive Analysis of Students' responses to Items Measuring their Experience in CBT Mode of Examination

S/N	Statements	SA		A		D		SD	
		F	%	F	%	F	%	f	%
1	I have not heard about CBT before	28	3.5	52	6.5	228	28.5	492	61.5
2	The use of Computer to write exams is new to me	16	2.0	28	3.5	284	35.5	472	59.0
3	There is little or no access to computer in my school	24	3.0	168	21.0	328	41.0	280	35.0
4	My first encounter with CBT examination was horrible	80	10.0	196	24.5	348	43.5	176	22.0
5	I'm comfortable using Computer to write examination	240	30.0	380	47.5	116	14.5	64	8.0
6	The CBT examination was confusing	28	3.5	140	17.5	512	64.0	120	15.0
7	The timing of CBT examination is not bias	176	22.0	400	50.0	196	24.5	28	3.5
8	The CBT examination was undertaken in a conducive environment	204	25.5	448	56.0	144	18.0	4	.5
9	The CBT was exam was better than the paper-based examination	64	8.0	372	46.5	280	35.0	84	10.5
10	The CBT examination was tedious	52	6.5	244	30.5	436	54.5	68	8.5
11	I have encounter system shutdown during my CBT examination	140	17.5	404	50.5	196	24.5	60	7.5
12	The CBT examination ensures fairness and equity	180	22.5	440	55.0	140	17.5	40	5.0

The results in Table 1 shows students' responses to 12 items measuring the experience were subjected to a descriptive analysis of frequency and percentage. Thereafter, in order to determine the experience of the students, their responses to the 12 items were scored and cumulated. The minimum and maximum responses obtainable were 12 and 48. High scores on this scale represent positive experience and vice versa. Therefore, all negatively worded items (items, 1, 2, 3, 4, 6, 10 and 11) were reversed in scoring before cumulating the responses. Scores of 12 through 30 on this scale were adjudged as Negative experience while scores of 31 through 48 were adjudged as Positive experience. The summary of this result is presented in Table 1.1.

Table 1.1: Undergraduate Students' Experience in Computer-Based Test (CBT) Mode of Examination in Private Institutions in Nigeria

Experience	Score Range	Frequency (f)	Percentage (%)
Negative	12-30	128	16.0
Positive	31-48	672	84.0
Total		800	100.0

Result in Table 1.1 shows that out of the 800 (100.0%) students that participated in this study, 128 (16.0%) had a negative experience while 672(84.0%) had a positive experience. As shown in the result, the experience of the majority of

undergraduate students in the use of CBT was positive.

Research Question 2: How effective is CBT mode of examination from the perspectives of undergraduate students in Private Universities in Southwestern Nigeria?

Table 2: Descriptive Analysis of Students' responses to Items Measuring the Effectiveness of CBT Mode of Examination

S/N	Statements	SA		A		D		SD	
		f	%	F	%	F	%	f	%
1	CBT has given me greater awareness of its use.	268	33.5	448	56.0	64	8.0	20	2.5
2	CBT has helped in the conduct of large number of students within a time frame	264	33.0	432	54.0	72	9.0	32	4.0
3	The speed of using CBT for examination is satisfactory	208	26.0	432	54.0	128	16.0	32	4.0
4	CBT examination enhances my academics ability.	184	23.0	364	45.5	188	23.5	64	8.0
5	CBT improves my academic performance.	172	21.5	396	49.5	196	24.5	36	4.5
6	CBT saves time than PBT.	264	33.0	304	38.0	224	28.0	8	1.0
7	CBT helps to reduce missing scripts.	284	35.5	384	48.0	100	12.5	42	4.0
8	There are usually no distractions that constitute a nuisance when using CBT for examination.	180	22.5	412	51.5	176	22.0	32	4.0
9	CBT makes examination easier for me	196	24.5	400	50.0	160	20.0	44	5.5

Result in Table 2 show students' responses to 9 items designed to measure CBT effectiveness were subjected to a descriptive analysis of frequency and percentage. Thereafter, in order to determine the effectiveness of CBT, students' responses to the 9 items were scored and cumulated. The minimum and maximum responses obtainable were 9 and 36. High scores on this scale represent more effectiveness and vice versa. Scores of 9 through 18 on this scale were adjudged as Not Effective, scores of 19 through 27 as Fairly Effective while scores of 28 through 36 were adjudged as Very Effective. The summary of this results is presented in Table 2.1

Table 2.1: Students' Description of Effectiveness of Computer-Based Test (CBT) Mode of Examination in Private Universities in Southwestern Nigeria.

Description of Effectiveness	Score Range	Frequency (f)	Percentage (%)
Not Effective	9-18	28	3.5
Fairly Effective	19-27	396	49.5
Very Effective	28-36	376	47.0
Total		800	100.0

Result in Table 2.1 shows that out of the 800(100.0%) students that participated in this study, 28(3.5%) described CBT as not effective, 396 (49.5%) described it as fairly effective while 376 (47.0%) described it as very effective. As shown in the result, while 49.5% of the students described CBT mode of examination as fairly effective, 47.0% described it as very effective.

Research Question 3: What are the challenges experienced by the students during the conduct of Computer-based Test (CBT) examination?

Table 3: Challenges Experienced by the Students' during the Conduct of Computer-Based Test (CBT)

		SA		A		D		SD			
S/N	**Challenges**	**F**	**%**	**F**	**%**	**F**	**%**	**F**	**%**	**RSI**	**Rank**
1	Interrupted power supply during CBT examination	276	34.5	312	39.0	120	15.0	92	11.5	0.74	**2nd**
2	Students' incompetence in the use of computer	224	28.0	344	43.0	156	19.5	76	9.5	0.72	**8th**
3	Insufficient CBT centres leading to examination batching system	288	36.0	316	39.5	96	12.0	100	12.5	0.75	**1st**
4	Irregular time-table for CBT examination	244	30.5	348	43.5	128	16.0	80	10.0	0.74	**2nd**
5	Network fluctuation disrupted some candidates speed of writing	248	31.0	296	37.0	196	24.5	60	7.5	0.73	**5th**
6	Insufficient ICT officers attached to the CBT centers	280	35.0	268	33.5	180	22.5	72	9.0	0.74	**2nd**
7	Insufficient computer made available	240	30.0	320	40.0	176	22.0	64	8.0	0.73	**5th**
8	Poor networking system leading to some student's inability to finish their CBT examination	272	34.0	248	31.0	196	24.5	84	10.5	0.72	**8th**
9	Attitude of invigilators during CBT is not pleasant	268	33.5	288	36.0	148	18.5	96	12.0	0.73	**5th**
10	Inadequate ICT infrastructure facilities	280	35.0	208	26.0	224	28.0	88	11.0	0.71	**10th**

The result in Table 3 shows students' responses to 10 items designed to measure challenges were subjected to a descriptive analysis of frequency and percentage. Also, the Relative Significance Index (RSI) of each challenge was calculated. The students identified insufficient CBT canters leading to examination batching system as the foremost challenges with RSI value of 0.75. While 36.0% and 39.5% of the students respectively strongly agreed and agreed to this challenge, 12.0% and 12.5% the students respectively disagreed and strongly disagreed. This challenged is ranked 1st among others. Challenges such as interrupted power supply during CBT examination, irregular time-table for CBT examination, and insufficient ICT officers attached to the CBT centers were ranked 2nd with RSI value of 0.74 for each. Similarly, network fluctuation, insufficient computer, and unpleasant invigilators' attitude were ranked 5th with RSI value of 0.73 for each. Closely followed were students' incompetence in the use of computer, and poor networking system ranked 8th with RSI of 0.72 for each while the least challenges was inadequate ICT infrastructure facilities that was ranked 10th with RSI of 0.71. It is therefore shown that challenges experienced by the students during the conduct of Computer-based Test (CBT) examination were insufficient CBT centers, interrupted power supply during CBT examination, irregular time-table for CBT examination, and insufficient ICT officers attached to the CBT, network fluctuation, insufficient computer and unpleasant invigilators'attitude.

Research Question 4: What are the benefits or improvement in the continuous use of the Computer Based Test?

Table 4: Benefits in the Continuous Use of the Computer Based Test

S/N	STATEMENT	SD		D		A		SA		RSI	Rank
		F	%	f	%	f	%	F	%		
1	CBT increases convenience for students and those who uses the test score	41	5.1	46	5.8	270	33.8	443	55.4	0.85	6th
2	CBT provides immediate scoring after examination	46	5.8	66	8.3	275	34.4	413	51.6	0.83	8th
3	CBT is quicker and better than paper and pencil test methods	46	5.8	46	5.8	198	24.8	510	63.8	0.87	4th
4	CBT is quick in release of results	26	3.0	41	4.7	275	31.3	538	61.1	0.86	5th
5	CBT saves time and manpower for the test administration	36	4.5	26	3.3	239	29.9	499	62.4	0.88	1st
6	CBT enhance the reading habit of the students	98	12.3	178	22.3	198	24.8	326	40.8	0.74	10th
7	CBT reduce loss of question-and-answer papers in transit	61	7.6	36	4.5	265	33.1	438	54.8	0.84	7th
8	CBT reduces the amount of printing question papers and answer booklets	26	3.3	21	2.6	254	31.8	499	62.4	0.88	1st
9	CBT minimizes the time-consuming in producing question papers for the examination	30	3.8	36	4.5	230	28.8	504	63.0	0.88	1st
10	CBT help to reduce cases of impersonation and adequate coverage of course syllabus in examination questions	77	9.6	92	11.5	250	31.3	381	47.6	0.79	9th

The result in Table 4, show students identified that CBT minimizes the time-consuming in producing question papers for the examination, CBT reduces the amount of printing question papers and answer booklets'', and "CBT saves time and manpower for the test administration" were ranked (1st) among the benefit into the continuous use of the CBT mode of examination with RSI value 0.88. while "CBT enhance the reading habit of the students" ranked the least (10th) with RSI value 0.74. "CBT help to reduce cases of impersonation and adequate coverage of course syllabus in examination questions" ranked the least (9th) with RSI value 0.79. the benefit into the continuous use of the CBT mode of examination. "CBT provides immediate scoring after examination" ranked the least (8th) with RSI value 0.83. This result suggests that undergraduate students showed preference continuous use of the Computer Based Test mode of examination.

Discussion of Findings

The findings of the study revealed that the students' perceived experienced in Computer-based Test (CBT) mode of examination in private Universities in Southwestern Nigeria was generally positive (84%). This result was similar to findings of other researchers such as (Telia & Bashorun, 2012; Jimoh, Yussuff, Akanmu, Enikuomehin & Salman, 2013; and Olafare, Sabainan, Christopher & Anne, 2017) that students' perceived computer-based test as positive experienced and useful. Telia and Bashorun (2012) indicated positive experience towards CBT among university undergraduate students in Ilorin. The result shown students preference for CBT over PPT. that students found CBT as a positive experience as they prefer CBT in writing their examination than the traditional paper and pen testing. Telia and Bashorun (2012) indicated students' positive experience towards CBT and students' preference for CBT over PPT. Olafare, Sabainan Christopher and Anne (2017) revealed that computer-based test mode of examination is effectives and students perceived computer-based test as useful However, the finding contradicts findings of Lyncha and Whitley (2000), Contugna and Vickny (2001), that all reported students' 'experience in the use of CBT as negative. Also, in contradictory to the findings of current study were the findings of Frankola (2000), and Bridgeman and Cline (2000). The plausible explanation for students perceived positive experience in Computer-based Test (CBT) mode of examination could be due to the tremendous breakthrough witness in Information Communication and Technology (ICT) in the recent years which seem to have increased students' access to internet or intranet usage. This could also be that the outbreak of the COVID-19 pandemic in the year 2020 which restricted movement compelled the higher institutions of learning across the nation to seek for an alternative and more friendly means of conducting assessment in the educational system in Nigeria.

Another major finding of this study revealed that majority of the students who participated in the study perceived that CBT mode of examination as fairly effective experience. This outcome has been found in consistent with previous findings (Tella & Bashorun, 2012; Fagbola, 2013; Abubarkar & Adebayo, 2014; Adebayo & Abdulhamid, 2014; Okocha, Eyiolorunshe, & Owolabi, 2017; Nwoke, 2017; Boeve, Meijer, Albers, Beetsma, Bosker, 2015). The plausible explanation for students' fairly effective perceived experience in Computer-based Test (CBT) mode of examination could be because Computer-based Test is a new innovation that requires training of which the existing university students may not have

Another interesting of this study is that majority of the students perceived insufficient CBT centers leading to examination batching system, interrupted power supply during CBT examination, insufficient ICT officers attached to the CBT, network fluctuation, insufficient computer, and unpleasant invigilators' attitude as the most challenges to the conduct of Computer-based Test (CBT) examination. This result corroborates the findings of the researchers (Ogwu, 2019; Wordu, Olutimilehin, and Kelechi, 2020; Oye, Salleh and Iahad, 2011; and Samuel, Ngozi, and Agnes, 2021) which buttress the fact on the students' most perceived challenges facing the conduct of Computer-based Test (CBT) examination as network connection, poor power supply and computer illiteracy, ICT infrastructure, students' inadequate skills etc. Azor and Ogwu, (2019) opined that weak network connection, poor power supply and computer illiteracy by students as challenges in using computer-based test. Oye, Salleh & Iahad (2011) stated that the challenge of erratic power supply. Wordu, Olutimilehin, and Kelechi, (2020) identified inadequate ICT infrastructure, poor power supply, students' inadequate skills in ICT as challenges experienced by students during the conduct of computer-based mode of examination. The plausible explanation for students' perceived challenges experienced in Computer-

based Test (CBT) mode of examination could be because of newly introduction of ICT integration into learning and the area is yet to developed in terms of ICT infrastructure facilities and network provision or facilities. This could also be that CBT examination as a new innovation is skillful subjects that requires specialist or trained staffs which the existing University invigilators may not have

The finding of the study revealed that CBT reduces the amount of printing question papers and answer booklets, saves time and manpower for the test administration as benefits in the continuous use of CBT to students. This implies that undergraduate students showed preference in continuous use of the Computer Based Test mode of examination.

Conclusion

The outcome of this study showed that undergraduate students are increasingly embracing the use of CBT mode of examination in their respective universities as being effective. Certain challenges were identified in its use and the university management should focus on the identified challenges in the bid of improving its effectiveness.

Recommendations

Based on the findings from the study, the following recommendations are made:

- There should be continuous use of the Computer Based Test (CBT) Mode of examination.
- CBT examination should not be limited to tertiary institution alone but at all levels of education should have access to e- examination.
- There should be attitudinal changes and compliance in teachers' and examiners' to setting of CBT questions.
- Provision should be made in training of teachers in the design and use of CBT.
- There should be adequate provision of ICT infrastructure facilities with the efficient power supply.
- Training of undergraduate students for the use of CBT during the orientation programmes in their respective institutions.
- Sufficient and qualified ICT officers should be trained and retained on the use of current CBT facilities.

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