

University of Ilorin Undergraduate Students' Perceptions of the Usefulness and Challenges regarding Computer-Based Testing

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Abstract

This study investigated the perceptions of undergraduate students at the University of Ilorin, Nigeria, of the usefulness and challenges associated with computer-based testing. The population for the study consisted of undergraduate students at the University of Ilorin. According to the data collected from the Directorate of Academic Planning at the University of Ilorin, Nigeria, the population of undergraduate students for the 2017/2018 academic session was 43 983. A simple random sampling technique was used to select the sample. A questionnaire was used as data collection instrument. The findings from the study showed that using a web-based assessment system contributed positively to the undergraduate students' academic achievements while the majority of them preferred taking all their exams with the web-based assessment system. The findings further revealed that to the undergraduate students, CBT is an interesting technique in examinations and makes the taking of examinations easier. Also, there is high level of competence among undergraduate students with regard to possession of the required skills for CBT examinations. Delays in the commencement of the exams, power failures at the CBT centre and overcrowding are major challenges encountered by the students taking CBT examinations. One of the study recommendations was that the university management should endeavour to eliminate the delays in the commencement of tests by providing assessment timetables which should be strictly adhered to.

Keywords: computer-based test, ICT, computer, assessment, perceived usefulness, examination

Introduction

Globally, the use of computer-based tests (CBT) is growing in educational institutions of higher learning. In fact, many institutions of higher education are now using CBT to conduct their entrance examination. The use of CBT is as a result of the ICT revolution which has affected nearly all activities in educational organisations. CBT, also known as computer-based assessment (CBA), e-examination, e-assessment, computerised testing, computer-administered testing, computer-assisted testing (CAT), computerised assessment, computer-aided assessment (CAA), online assessment, web-based assessment, technology enhanced assessment, and automation assessment, is a method of administering tests in which the responses are electronically recorded, assessed, or both. CBT enables educators to author, schedule, deliver, and report on surveys, quizzes, tests, examinations and other forms of testing.

When conducting a CBT, the candidate sits in front of a computer and submits answers to the questions which are presented on the computer monitor through the use of a keyboard and mouse (Ogunlade and Olafare 2011). CBT could be conducted on a stand-alone system or as part of a virtual learning environment, usually accessed via the World Wide Web (Kuzmina 2010). Alabi, Issa, and Oyekunle (2012) describe CBT as a method of administering tests in which the responses are electronically recorded, assessed, or both. CBT is grouped into linear or fixed CBT and adaptive CBT. Linear and fixed CBT, which is similar to paper-based testing, is the random method which can be used to administer a fixed set of items to provide a modest test security benefit. Alabi, Issa, and Oyekunle (2012) define a linear CBT as a full-length examination in which the computer selects different questions for individuals without considering their performance level. In CBT adaptive testing, when an examinee answers a question correctly, the next test item has a slightly higher level of difficulty. And the difficulty of the questions presented to the examinee continues to increase until a question is answered incorrectly.

Many higher educational institutions today are adopting CBT for the conduct of their examinations. Olumorin et al. (2013) note that CBT has gained popularity as a means of testing with large scale professional examinations such as the United States Medical Licensing Examination (USMLE) in 1999. However, the popularity emerged through the post-Universities Matriculation Examination and university main examinations in Nigeria. Educational institutions such as the University of Ilorin, the Federal University of Technology Akure, and the Federal University of Technology Minna, are maximising the use of CBT as a tool for undergraduate and postgraduate assessments. Today, virtually every university in Nigeria has integrated CBT into their academic systems. The rationale behind this might be connected with the benefits associated with CBT.

According to Oyibe, Edinyang, and Effiong (2015), CBT provides opportunities to measure complex forms of knowledge and reasoning that are not possible to engage and assess through the traditional paper-and-pencil test (PPT) method. Oyibe, Edinyang, and Effiong (2015) also noted that e-examinations can be used to assess both cognitive and practical abilities. Cognitive abilities are assessed using e-testing software while practical abilities are assessed using e-portfolios or simulation software. Similarly, Obioma, Junaidu, and Ajagun (2013) opined that automated assessments, if carefully designed, can comprehensively and reliably assess students in the three domains (cognitive, psychomotor and affective) of learning. The key benefits attached to CBT include but are not limited to lower long-term costs, instant feedback to students, increased productivity and low operational variability, accommodation of candidates with special needs, and improved impartiality (computerised marking does not “know” the students so does not favour nor make allowances for minor errors) (Adepoju 2016). Other notable merits of CBT include the elimination of impersonation and cheating. The method also ensures the release of results a few hours after the examination (Abubakar and Adebayo 2014; Obioma, Junaidu, and Ajagun 2013; Ojerinde 2015).

Adepoju (2016) emphasised that despite the increasing use of ICT in educational testing, CBT is fraught with many challenges, foremost among which have been identified to include resistance to change, inadequate power supply, lack of knowledge, low competency and familiarity with computers, lack of qualified personnel, shortage of facilities such as computers and related devices, and erratic internet networks. Irrespective of the advantages and benefits of CBT together with the corresponding challenges, the test takers’ perception of its usefulness and the challenges they may encounter when writing examinations over the platform are important factors to reckon with. Perceived usefulness of CBT by the test takers which are always the students is defined as the degree to which a test taker believes that using a particular CBT will enhance his/her performance in the examination. Likewise, learners may believe that a CBT system will improve their knowledge, comprehension and performance for the course. Moreover, if the CBT is useful for the learner then it will help to increase the learner’s concentration, curiosity and probably enjoyment. The same can be said of the perceptions of challenges which refer to the perspectives of the challenges associated with CBT. However, it is the general challenges of CBT that have been given serious consideration in the literature at the expense of the test takers’ perceptions of the challenges associated with CBT.

Statement of the Problem

From the information system research perspective, the perceptions of usefulness of an information system usually go a long way to determine its actual use by the users. Similarly, the extent of challenges associated with the system can either determine or hinder the use of the system. From the literature, it is observed that the perceptions of the usefulness of CBT to the test takers seem to have been ignored whereas the test takers (the students) are the major stakeholders of the CBT system. Furthermore, from

the literature, limited studies are available that focused on the perceived usefulness of and challenges associated with CBT from the perspectives of the test takers – the students. In addition, the University of Ilorin is one of the higher education institutions in Nigeria that first adopted the use of CBT in the conduct of examinations for both the undergraduate and graduate students and more resources have been expended on the system. However, there has not been an empirical record of the students' perceptions of the usefulness and challenges of CBT at the university. To fill these identifiable gaps, this study sought to examine the perceptions of undergraduate students at the University of Ilorin of the usefulness and challenges associated with CBT.

Objectives of the Study

The broad objective of this study is to examine the perceptions of undergraduate students at the University of Ilorin of the usefulness and challenges associated with CBT. The specific objectives of the study are to:

- determine the perceived usefulness of CBT by the undergraduate students of the University of Ilorin;
- examine the perceptions of undergraduate students at the University of Ilorin of CBT;
- ascertain whether or not the undergraduate students at the University of Ilorin possess the necessary skills to effectively take examinations through CBT; and
- identify the challenges faced by the undergraduate students when taking examinations through CBT.

Research Questions

To achieve the objectives in this study, the following research questions will be answered.

- What is the perceived usefulness of CBT by the undergraduate students at the University of Ilorin?
- What are the perceptions of the undergraduate students at the University of Ilorin of CBT?
- Do the undergraduate students at the University of Ilorin possess the necessary skills to effectively take examinations through CBT?
- What are the challenges faced by the undergraduate students when taking examinations through CBT?

Literature Review

Concept of Computer-Based Testing

CBT is an efficient way for test sponsors to provide a secure, consistent environment for certification and licensure as it also enhances students' experiences (Abubakar and Adebayo 2014). Ogunlade and Olafare (2011) note that CBT is the use of computers to administer tests to candidates. This means that the candidate sits in front of a computer and submits the answers to the questions, which are presented on the computer monitor, through the use of a keyboard and mouse (Ogunlade and Olafare 2011).

Conole and Warburton (2005) define CBT as the use of computers for assessing students' learning. CBT is the form of assessment in which the computer is an integral part of question papers' delivery, response storage, marking of responses or reporting of results from a test or exercise (Lim et al. 2006). The British Psychological Society Psychological Testing Centre (2002) as cited by Anujeonye (2019) refers to CBT as any psychological test or assessment that involves the use of digital technology to collect, process and report the results of that assessment.

According to Ogunlade and Olafare (2011), CBT is a way of conducting examinations with the use of a computer as a medium. They further described it as a test that can be used in a supervised or non-supervised environment. Bolboac and Lorentz (2007) assert that CBTs are assessments that are administrated by a computer in a stand-alone or dedicated network, or by other technology devices linked to the internet or World Wide Web where most of them use multiple choice questions (MCQs).

Jimoh, AbdulJaleel, and Kawu (2012) opine that computer-based assessment systems have enabled educators and trainers to author, schedule, deliver, and report on surveys, quizzes, tests and exams. CBT is an efficient way for test sponsors to provide a secure, consistent environment for certification and licensure as it also enhances students' experiences (Abubakar and Adebayo 2014). Ogunlade and Olafare (2011) asserts that CBT helps to develop new assessment methods by combining flexible technical possibilities with elaborated understanding of how to assess various forms and levels of knowledge. CBTs can be applied to promote further efficient learning by examining students' knowledge and understanding in many fields such as chemistry courses (Dammass 2016).

Types of Computer-Based Tests

According to Professional Testing Inc. (2006), there two basic types of CBT, namely linear and fixed CBT, and computer-adaptive testing (CAT).

- **Linear and fixed CBT** are test delivery methods that are most similar to paper-based testing. Linear and fixed CBT are the random methods which can be used to administer a fixed set of items to provide a modest test security

benefit (Professional Testing Inc. 2006). This is the most common type of CBT.

- **CAT** is a criterion-referenced test. In CAT, when a user answers a question correctly, the next test item has a slightly higher level of difficulty. The difficulty level of the questions presented to the examinee continues to increase until a question is answered incorrectly. Then a slightly easier question is presented. In this way the test is tailored to the individual's ability level (Professional Testing Inc. 2006).

Perceived Usefulness of CBT

Perceived usefulness is defined as the degree to which a person believes that using a particular system will enhance his/her job performance (Davis 1989). Many researchers provide evidences of the effects of perceived usefulness on the behavioural intention to use a learning system (for example Lee 2008; Ong and Lai 2006; Van Raaij and Schepers 2008). Likewise, learners may believe that a CBT system will improve their knowledge, comprehension and performance for the course. Moreover, if the CBT is useful for the learner then it will help to increase the learner's concentration, curiosity and probably enjoyment.

Literature abounds with various advantages of the use of CBT. The key advantages include lower long-term costs, instant feedback to students, increased productivity and low operational variability, accommodation of candidates with special needs, and improved impartiality (computerised marking does not "know" the students so does not favour nor make allowances for minor errors). Other observable merits of CBT include the elimination of impersonation and cheating. The method also ensures the release of results a few hours after the examination (Abubakar and Adebayo 2014; American Psychological Association 1986; Obioma, Junaidu, and Ajagun 2013; Ojerinde 2015; Okoronkwo 2015).

Challenges of taking CBT Examinations

CBT is still a new phenomenon in Nigeria. However, CBT in the conduct of examinations in Nigeria poses a lot of challenges. These challenges have been categorised as follows:

- **Economic factors:** ICTs remain a low financial priority in most educational systems in Africa. Most countries in the region lack resources for sustainable integration of ICTs in education (Adomi and Kpangban 2010). This has made it difficult for full integration of CBT, particularly in developing countries.
- **Security factors:** Owing to the transferring of the question involved, the security of the system is at risk. There may be a higher risk of e-cheating, for example by hacking the database of the question items, that can result in total loss of examination data, or a lower security of sensitive personal data is inevitable (Olumorin et al. 2013).

- **Poor ICT culture, policy and implementation:** The ICT revolution is yet to attain that critical mass required for it to register the necessary impact on the teaching, student and civilian population nationwide.
- **Poor ICT funding:** E-learning and ICT applications to education in general may come of age in Nigerian schools. Schools in Nigeria are not given adequate funds to provide furniture, requisite books, laboratories and adequate classrooms let alone being given adequate funds for high-tech equipment (computers) and internet connectivity (Aduwa-Ogiegbaen and Iyamu 2005).
- **Poor information infrastructure:** The lack of requisite telecommunications infrastructure that is capable of transporting multimedia messaging is another major challenge (Osei 2007). Research confirms that one impediment to the use of ICT in Nigerian school is poor information infrastructure.
- **Power failures:** The lack of electric power and telecommunications infrastructure in a considerable part of the country is a problem. The inability of the power distribution company to guarantee supply of power constitutes the bottleneck to the effective countrywide deployment of ICT in education (Osei 2007).

Empirical Review

Bodmann and Robinson (2004) conducted an experimental study to compare speed and performances differences between CBTs and PPTs. In the experiment, 55 undergraduate students who were enrolled in the subject of educational psychology participated in the studies which were already familiar with CBT. Both CBTs and PPTs contained 30 MCQs items with a 35 minute time limit. Approximately half of the class (28 students) took the first test on the computer and the rest preferred to take the first test on paper. The procedures shifted for the second tests, when the first group received PPTs and second group CBTs with a gap of two weeks. It was concluded that the undergraduates completed the CBT faster than PPT with no difference in scores.

Fluck, Pullen, and Harper (2009) conducted an e-examination for the students of the four-year Bachelor of Education programme at the University of Tasmania. Students' ($N = 270$) achievements were assessed through two equally weighted activities; first was a home assignment in which the students explored the learning content through the use of ICT, and the second activity was a two-hour test that comprised 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 the students. The survey indicated that 38 per cent of the survey respondents had previously taken a CBT exam, 78 per cent had used the practice compact disc before the e-examination, and 71 per cent had found it very or moderately useful. The valid responses ($N = 230$) indicated that 94.5 per cent preferred CBT. The prior exposure to CBT was a highly significant factor for preferring the computer medium.

Jimoh, AbdulJaleel, and Kawu (2012) conducted a study on students' perceptions of CBT for examining the undergraduate Chemistry Course. The study was carried out at the University of Ilorin. The study was guided by six research questions. The sample for the study was made up of 48 students who had taken a test on CBT in Chemistry. The sample consisted of 37 (77.8%) male and 11 (22.9%) female participants. The instrument for the study was a questionnaire developed by the researchers. Percentages, and mean and standard deviations were used to answer the research questions. The study showed that the majority (95.8%) of the students said they were competent with the use of a computer, and 75 per cent said their computer anxiety was only mild or low but notwithstanding they have not fully accepted the testing mode. A total of 29.2 per cent were in favour of the CBT, owing to the impaired validity of the test administration which they reported as containing many erroneous chemical formulas, equations and structures in the test items even though they have nonetheless identified the achieved success the testing has made such as immediate scoring, fastness and transparency in making. The study under review and the present study are both concerned with perceptions of the use of CBT. However, while the study under review is on the use of CBT in examining the undergraduate student course in chemistry, the present study will be considering available undergraduate programmes at the University of Ilorin.

Samson and Okon (2016) investigated the perceptions of students on CBT used by the Kogi State University in Nigeria. The study used a self-designed questionnaire to gather data from randomly selected students of the institution sitting for the second semester GST examinations during the 2013/2014 academic session. The data collected were analysed using frequency counts, percentages, and a Likert scale was used to test the hypothesis generated. The findings showed that a large number of respondents strongly agreed that they spend less time doing online examination and their perception shows that online examination allows them to express their mind. In conclusion, the study found that gender does not have a significant influence on students' perceptions of CBT or examinations at the Kogi State University in Nigeria.

Ulfa (2017) examined the relationship between the perceived ease of use, perceived usefulness, and attitude to behavioural intention in using CBT for the university entrance examination at the State University of Malang in Indonesia. The research findings had proven the previous studies' theory that the perceived ease of use has a positive influence on perceived usefulness, while both have direct effects on the attitude to usage. Furthermore, attitude has an impact on behavioural intention.

Lastly, Olafare et al. (2017) investigated students' perceptions of CBT in Nigerian universities. The study adopted the survey method of descriptive research. A sample was drawn from students from four Nigerian universities: Covenant University, Kogi State University, the University of Ibadan, and the University of Ilorin. A total of 1 506 students represented the sample for the study. The data were analysed using percentages and means to answer the research questions. On the perceived ease of use, the results showed that CBTs have been easy to use by students in Nigerian Universities.

Methodology

The study adopted a descriptive survey research design. This particular study was being undertaken to investigate the perceptions of undergraduate students at the University of Ilorin of the usefulness and challenges associated with CBT. Therefore, the population of this study consisted of the entire population of undergraduate students at the University of Ilorin who usually do their examination on CBT platforms. According to the data collected from the Directorate of Academic Planning, University of Ilorin, the population of undergraduate students at the time of this study was 43 983. The Israel sample size model (2003) was used to determine the sample size with precision levels of 5 per cent and confidence level of 95 per cent and the recommended sample size was 381. A simple random sampling technique was used to select the samples from the population. The data were collected through a self-developed questionnaire. Copies of the collated questionnaire were analysed using IBM SPSS version 21.0. The presentations of the data for the research objectives were done using tables.

Findings and Discussion of the Findings

Demographic Characteristics of the Respondents

Table 1 reveals the distribution of the respondents across the 15 faculties at the University of Ilorin. The Faculty of Education had the highest number of respondents while faculties of Basic Medical Sciences, Law, Life Sciences, and Veterinary Medicine had the lowest respondents each. Table 1 further reveals that 70 (18.5%) of the respondents were at the 100 level, 140 (36.4%) were at the 200 Level, 98 (25.9%) were at the 300 Level, 49 (12.9%) were at the 400 Level, while 22 (5.8%) were at the 500 Level. This implies that the majority of the respondents were at the 200 Level. Table 1 also shows that 92 (24.3%) of the respondents were between the age range of 15 to 19 years, 184 (48.5%) were between the age range of 20 to 24 years, 99 (26.1%) were between the age range of 25 to 29 years, while 4 (1.1%) were between the age range of 30 to 34 years. This implies that the majority of the respondents were between the age range of 20 to 24 years. Lastly, Table 1 reveals that that 236 (62.3%) of the respondents were male while 143 (37.7%) of the respondents were female.

Table 1: Distribution of the respondents across the faculties

Demographic characteristics	Frequency	Percentage
Faculty		
Agriculture	26	6.4
Art	25	6.4
Basic Medical Sciences	24	6.1
Clinical Sciences	25	6.4
Communication and Information Sciences	26	7.2
Education	28	7.2

Demographic characteristics	Frequency	Percentage
Engineering and Technology	25	7.2
Environmental Sciences	26	7.2
Law	24	6.7
Life Sciences	24	6.4
Management Sciences	26	6.4
Pharmaceutical Sciences	25	6.4
Physical Sciences	25	6.4
Social Sciences	26	6.7
Veterinary Medicine	24	6.9
Total	379	100
Levels		
100 Level	70	18.5
200 Level	140	36.9
300 Level	98	25.9
400 Level	49	12.9
500 Level	22	5.8
Total	379	100
Age		
15–19	92	24.3
20–24	184	48.5
25–29	99	26.1
30–34	4	1.1
Total	379	100
Gender		
Female	143	37.7
Male	236	62.3
Total	379	100

On the perceived usefulness of CBT by the undergraduate students, Table 2 shows that the majority of the respondents (269; 71.0%) perceived that using the web-based assessment system improved their academic achievements, 251 (66.2%) perceived that using the web-based assessment system increased their productivity in the exams, 233 (61.5%) perceived that using the web-based assessment system enhanced their effectiveness in the course, 213 (56.2%) perceived that if offered, they intend to take all exams with the web-based assessment system, 218 (57.5%) perceived that they wish they used the web-based assessment system for other courses as well, and 218 (57.5%) perceived that the way they use a computer-based system is influenced by how others think they should use it.

Table 2: The perceived usefulness of CBT by the undergraduate students

Statement	Strongly Agreed		Agreed		Disagreed		Strongly Disagreed	
	F	%	F	%	F	%	F	%
Using the web-based assessment system improved my academic achievement	170	44.9	99	26.1	36	9.5	74	19.5
Using the web-based assessment system increased my productivity in the exam	121	31.9	130	34.3	58	15.3	70	18.5
Using the web-based assessment system enhanced my effectiveness in the course	146	38.5	87	23.0	62	16.4	84	22.2
If offered, I intend to take all exams with the web-based assessment system	140	36.9	73	19.3	62	16.4	104	27.4
I wish I used the web-based assessment system for other courses as well	128	33.8	90	23.7	53	14.0	108	28.5
The way I use a computer-based system is influenced by how others think I should use it	92	24.3	126	33.2	121	31.9	40	10.6

On the perceptions of the undergraduate students at the University of Ilorin of CBT, Table 3 shows that the majority of the respondents (305; 80.5%) perceived that CBT is an interesting technique in examinations, 236 (62.3%) perceived that CBT makes them anxious, 243 (64.1%) perceived that taking all courses using CBT will be more convenient for them, 303 (80.0%) perceived that the online test environment is appropriate and convenient for test taking, 273 (72.0%) perceived that using a computer makes examination writing easier for them, and 244 (64.3%) perceived that because they can guess the answers, the online MCQs do not really reflect their level of knowledge.

Table 3: The perceptions of undergraduate students at the University of Ilorin of CBT

Statement	Strongly agreed		Agreed		Disagreed		Strongly disagreed	
	F	%	F	%	F	%	F	%
CBT is an interesting technique in examinations	208	54.9	97	25.6	42	11.1	32	8.4
CBT test makes me anxious	111	29.3	125	33.0	111	29.3	32	8.4
Take all courses using CBT will be more convenient for me	157	41.4	86	22.7	90	23.7	46	12.1
The online test environment is appropriate and convenient for test taking	155	40.9	148	39.1	46	12.1	30	7.9
Using a computer makes examination writing easier for me	184	48.5	89	23.5	64	16.9	42	11.1
Because we can guess the answer, online MCQs do not really reflect our level of knowledge	101	26.6	143	37.7	104	27.4	31	8.2

On the undergraduate students and their skills to effectively take CBT examinations, Table 4 shows that the majority of the respondents (319; 84.2%) think they have enough knowledge to be able to use a new computer system, 349 (92.1%) think they have sufficient knowledge to use a new computer if they get support, 263 (69.4%) think they are experienced computer users, therefore using CBT is not a problem for them, 251 (66.2%) have a very good knowledge of word processors, and 241 (63.6%) think a basic knowledge of computers is all they need to take CBT exams. However, the majority of the respondents (197; 52.0%) do not feel insecure when they use computers or computer systems because they have the necessary skills.

Table 4: Undergraduate students and their skills to effectively take CBT examinations

Statement	Strongly agreed		Agreed		Disagreed		Strongly disagreed	
	F	%	F	%	F	%	F	%
I think I have enough knowledge to be able to use a new computer system	197	52.0	122	32.2	36	9.5	24	6.3
I think I have sufficient knowledge to use a new computer if I get support	116	30.6	233	61.5	26	6.9	4	1.1
I feel insecure when I use computers or computer systems because I lack the skills	92	24.3	90	23.7	142	37.5	55	14.5
I am an experienced computer user therefore using CBT is not a problem for me	117	30.9	146	38.5	92	24.3	24	6.3
I have a very good knowledge of word processors	116	30.6	135	35.6	102	26.9	26	6.9
Basic knowledge of computers is all I need to take CBT exams	100	26.4	141	37.2	102	26.9	36	9.5

On the challenges of taking CBT examinations by undergraduate students, Table 5 reveals that delays in the commencement of the exams (301; 79.4%), power failures at the CBT centre (206; 54.4), and overcrowding due to the number of students (329; 86.9%) are major challenges encountered by students taking CBT examinations.

Table 5: Challenges of taking CBT examinations by undergraduate students

Statement	Strongly agreed		Agreed		Disagreed		Strongly disagreed	
	F	%	F	%	F	%	F	%
Delays in the commencement of the exams	210	55.4	91	24.0	48	12.7	30	7.9
The test did not finish on time	74	19.5	92	24.3	144	38.0	69	18.2
Power failures at the centre	70	18.5	136	35.9	124	32.7	49	12.9

Statement	Strongly agreed		Agreed		Disagreed		Strongly disagreed	
	F	%	F	%	F	%	F	%
The centre was not conducive for the test	74	19.5	67	17.7	165	43.5	73	19.3
Inadequate knowledge of computers or ICT	53	14.0	94	24.8	163	43.0	69	18.2
Not familiar with answering questions on a computer screen	65	17.2	74	19.5	171	45.1	69	18.2
Lack of assistance at the CBT centre	96	25.3	80	21.1	144	38.0	59	15.6
Overcrowding due to the number of students	242	63.9	87	23.0	44	11.6	6	1.6

Discussion of the Findings

The findings from the study show that the perceived usefulness of CBT among undergraduate students indicates that using a web-based assessment system has a positive significant effect on their academic achievements and it is their preference for taking CBT examinations. The majority of the respondents agreed that using a web-based assessment system contributed positively to their academic achievements and therefore have high preference for taking all their exams with a web-based assessment system. This finding is similar to that of Clariana and Wallace (2002) who reported that students that took their exams with CBT outperformed those that took their exams with PPT. In another twist, Ricketts and Wilks' (2001) findings negate this finding because it was discovered that students displayed poor performance using the online assessment method in a numeracy and statistics test.

Generally, the research findings confirmed the technology acceptance model (TAM) propounded by Davis (1989), which asserts that perceived ease of use has a positive influence on perceived usefulness, while both perceived ease of use and perceived usefulness have direct effects on the attitude to usage.

On the perceptions of the undergraduate students at the University of Ilorin of CBT, the findings show that there are positive perceptions among the students of CBT as the majority of the respondents agreed that CBT is an interesting technique in examinations, makes examination easier, and that the online test environment is appropriate and convenient for test taking. These findings are validated by Ayo et al. (2007) who reported that students have a positive attitude to CBT. However, the majority of the respondents agreed that CBT makes them anxious. This finding is similar to the finding of Ozden, Erturk, and Sanli (2004) which showed that students perceived an online assessment as an effective testing mode.

On the possession of skills to effectively take CBT examinations, it was revealed that the majority of the respondents think they have enough knowledge to be able to use a new computer system; likewise, the majority of the respondent thinks they have sufficient knowledge to use a new computer if they get support coupled with the fact that the majority of the respondents agreed that they are experienced computer users, therefore using CBT is not a problem to them. Generally, this shows that the majority of the students have skills to effectively take CBT examinations. This is in consonance with the finding of Jimoh, AbdulJaleel, and Kawu (2012) which showed that the majority of Chemistry undergraduate students are competent with the use of computers. This finding is further corroborated by Struyven, Dochy, and Janssens (2002) who asserted that students with good learning skills and high confidence in their academic ability, tend to prefer the constructed-response type of assessment over the multiple-choice type.

On the challenges of taken CBT examinations by undergraduate students, delays in the commencement of the exams, power failures at the CBT centre and overcrowding due to the number of students are major challenges encountered by the students. This finding contradicts the finding of Durojaye and Omotehinwa (2013) where security and result integrity were found to be the objects of enthusiasm.

Conclusions

In addition to the available empirical evidences, this study has been able to establish empirical evidence on the perceptions of the undergraduate students at the University of Ilorin on the usefulness and challenges associated with CBT. It is interesting to note that the predominant mode of student assessments in Nigeria is the traditional method. In this method, the students are assessed, using paper and pen, on their cognitive abilities. However, recently, many tertiary and educational institutions have integrated computer-based assessments into their mode of assessing students. It is also worthy of note that the CBT system is not new among the students and to some extent, the majority of them found it interesting and fascinating.

Recommendations

Based on the findings of this study and the conclusions drawn, the following recommendations directed at the universities management and students are made:

- Adequate security personnel and manpower should be provided so that they can help in the coordination of affairs when students take examinations in order to reduce the overcrowdedness being experienced at the CBT system.
- The university management should endeavour to eliminate the delays in the commencement of tests by providing an assessment timetable that would be strictly adhered to.

- Students who take examinations at the CBT system centre should ensure orderliness and shun rowdiness.

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