AN ASSESSMENT OF THE EFFECT OF PRIOR KNOWLEDGE IN READING, COMMUNICATION AND COMPUTER LITERACY SKILLS ON COMPUTER BASED TESTS

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ABSTRACT: *Assessment in an integral aspect of educational sector where knowledge acquired by students are tested through this medium. Currently, Computer-based test (CBT) has become the means by which educational assessment is carried out, particularly, in school where physical assessment is difficult. However, most of the students exposed to this form of examination does not possess prior skills required to effectively deliver, hence the need to be acquainted with the modalities involved. This paper assessed the effect of prior reading, communication and computer literacy skills and its effect on the Computer-based test. A quantitative approach using survey questionnaires was adopted to carry out the analysis using purposive sampling technique. The population sample comprised, one hundred and twenty students of the Federal Polytechnic Ilaro which is the case study who had taken CBT entrance examination. The population samples are from 100 - 400 level students selected from the five Schools of the Institution. The findings showed that the majority of respondents have negative attitude towards CBT (75.30%) and they stated that they were incompetent with the use of computer due to their no prior knowledge of adequate reading skills, communication and computer literacy. The performance of the students in the reading skill, communication and computer literacy was low on the validity. This paper concluded that more teachings on reading skills, communication and computer literacy are still needed for the students to perform well compared with their International counterpart's globally for innovation and global competitiveness.*

KEYWORDS: computer based test, communication and computer literacy, global competitiveness, reading skill,

INTRODUCTION

Students' assessment is quite basic and central in all teaching and learning institutions. At the end of every academic semester and session, teachers and lecturers evaluate students learning outcomes to determine the extent to which educational goals have been accomplished as well as to reward students according to their performance. In the past ten years, there had been gradual shift from the paper and pencil testing (PPT) to computer-based testing (CBT) in almost all the higher institutions of learning in Nigeria. Starting from the point of gaining admission, prospective students are subjected to different computer-based testing in the form of Joint Admissions Matriculations, Examinations and Post-University Matriculation Screening Examinations. Then,

after gaining admissions, students also take computer-based examinations in their various departments. One common assumption is that students who have prior knowledge of the computer would perform better in CBT than those who are new to the computer technological. That is, there is the possibility that lack of computer skill and anxiety on the part of students may unfairly hamper their performance on the computer-based tests. In other words, students who are accustomed to effective communication, basic reading skills and computer literacy skills perform better than novices who are being confronted with unfamiliar machines.

Computer-based tests (CBT), in particular, are the form of assessment in which the computer is an integral part of question papers' delivery, response storage, marking of response or reporting of results from a test or exercise (Conole and Warburton, 2005; Lim, *et al.,* 2006). It is a paperless process by which exams are designed, developed, delivered and scored by computer with the key element of Multiple-Choice Question (MCQ). The questions are authored and loaded into the servers, these questions are then delivered to the test-taker based, a randomization algorithm; the assessment is marked by the computer and his/her result is instantly made available. As a new assessment method that goes beyond the conventional practices, CBTs are methods that may not suit the learning styles of many students because students' prior experience in computer and communication skills is essential.

A Comparative study by Millsap (2000) on paper-pencil test (PPT) and CBT made divergent findings with some students preferring CBT to PPT, others reported that the main disadvantage of CBT is increased anxiety amongst those unfamiliar with use of computer, called "technophobic". Some of the reasons for the preference are that CBT is interactive, exciting, accurate, secure, credible, and smooth (Sorana-Daniela and Lorentz, 2007). Also, several competitive advantages that CBT has such as less cost, more security, and high accuracy. Furthermore, it minimizes the required efforts to accomplish tasks, and time for test preparation, marking, scheduling, recording and analyzing the results. Previously, in Nigerian higher institutions, the most applied examination evaluation of students' knowledge is the traditional method which involves a combination of essay and practical tests. However, CBT is fast in testing, scoring and reporting results (Abubakar and Adebayo, 2014).

Reading is the ability to respond verbally or silently to printed materials in texts and passages. It is the process of giving significance intended by the writer to the graphic symbols by relating them to one's own experiences (Adegbite and Adeyemi, 2013). It is also the meaningful interpretations of printed or verbal symbols. The basic reading skill is the movement of eyes from one angle to the other. This is called the physical or visual reading and the other skill is with the mind and mental exercise, which involves interpreting the ideas in the piece. This means that while reading is going on, one is interpreting the printed serial in order to achieve the aim of the reading. Communication skills is a task requiring a collective nationwide effort. It also requires hope, vision, dedication, imagination, and the confidence in carrying it out (Degboro, 2017).

This study, therefore, assessed the effects of prior knowledge of reading skills, communication, and computer literacy on the CBT performance of students in the Federal Polytechnic, Ilaro. It investigated students' reactions to computer testing and determine if the amount of previous

experience with computers affect the scores of students tested through CBT. Also, the perceptions and attitudes of students towards this same exam was investigated to identify the technical and scientific issues faced.

REVIEW OF RELATED STUDIES

Different scholars have examined the use of CBT in testing students' knowledge and perception all over the world. At the global scene, Dramas investigated students' attitudes towards Computer Based Test (CBT) at Chemistry course at the King Abdul-Aziz University (KAU) – college of Science, Jeddah City while Jimoh, Shittu and Kawu, (2012) examined students' perception of Computer Based Test (CBT) for examining undergraduate Chemistry course. Also, Terzis and Economids (2011) examined gender differences in perceptions and acceptance of computer-based assessment.

In Nigerian context in particular, Adeyinka and Bashorun (2012) examined the attitude of the students towards computer-based test (CBT) at the University of Ilorin, Nigeria. The study used a case study research design and a sample consisting of 2209 undergraduate students selected from seven out of the ten faculties that made up the university. The data was collected through a computer-based test attitudinal survey (CBTAS) and a focus group discussion while the results show that the respondents generally have positive attitude towards CBT. Also, more than average of the respondents' preferred CBT to paper and pencil test and the respondents also demonstrated strong perception of increase in their learning performance as a result of taking CBT/examination. Conversely, the study discovered challenges to CBT such as shortage of computers, lack of skills, loss of data in the process of writing CBT, slow network and hazards of reading on the screen.

Ogunlade, Oyeronke and Olafare (2011) investigated students' characteristics as predictors of their perceptions on the effectiveness of computer-based test in Nigerian universities. It used a survey study involving 1506 students selected from four Nigerian universities namely, University of Ilorin; Kogi State University; Covenant University and University of Ibadan. All the Universities made use of CBT. The survey method is complemented with the modified Technology Acceptance Model (TAM) as the research framework. The study revealed amongst others that the usefulness, ease of use and credibility are evident and important in the use of computer-based test in Nigerian universities. Based on the result, it was recommended that students' gender and field of study be considered in the use of CBT.

Joshua *et al*., (2016) examined the acceptability and readiness levels of critical stakeholders (students) to the use computer-based testing (CBT) version by Joint Admission and Matriculation Board (JAMB) in its Unified Tertiary Matriculation Examination. Using a survey research design and a sample population comprising 600 final year students in 10 secondary schools in Cross River State, drawn using stratified random sampling to take care of gender, school location and school proprietorship variables, the study discovered that the level of readiness for CBT is high, but that of acceptability was moderate, with a relatively higher preference by students federal government owned and privately owned schools. It concluded that Nigerian students were supportive of innovations that would ensure international best practices in the nation's school system.

In the same vein, Abubakar and Adebayo (2014) examined the prospects, challenges and strategies of using Computer Based Test Method for the Conduct of Examination in Nigeria. It discovered that the adoption of CBT in Nigeria faces ten critical challenges amongst this are economic factor, security, Software; Poor ICT culture, policy and implementation; and power failure. Therefore, the study identified educational presentation on CBT, public relation campaign, web campaign, post test feed-back, regular power supply, implementation of ICT policy as approaches to defuse the challenges.

Olafare *et al*. (2018) investigated Computer based test as panacea to undergraduate students' performance in Olabisi Onabanjo University, Ogun State, Nigeria. It used a descriptive research design and designed questionnaire for the study. The questionnaire was administered on a total of 125 undergraduates but 115 were filled properly and returned. Analyzing the data using descriptive statistics (mean and standard deviation), the findings revealed that though CBT had positive influence on undergraduate students' performance, it is saddled with a lot of challenges. The study recommended that adequate facilities should be made available, as well as enforcing Government policy on computer education at the primary and secondary school levels to ensure that all students are computer-literate.

On their part, Durojaye and Okokondem (2016) investigated students' perception of Computer-Based Test in Kogi State University using a quantities approach (Questionnaire). The questionnaire was randomly distributed to students of the institution who were sitting for the second semester GST examinations during the academic year 2013-2014. The data collected were analyzed using frequency counts and percentages and the findings showed that a large number of respondents strongly agree that they spend less time doing online examination and their perception shows that online examination allowed them to express their minds. Concerning perception that male students prefer computer-based test to paper and pencil examinations, so many respondents disagreed. Though a high number of respondent disagreed with the view that females consider computer-based test to be more stressful but a slightly higher number strongly agreed. However, a large number of respondents strongly disagreed on the view that females find it hard to concentrate than males during computer-based test. The overall findings indicated that gender does not have significant influence on students' views of computer-based testing/examination in Kogi State University. The study recommended that ICT training and awareness should be adequately given to the students prior to the period of computer-based testing and the authorities should work towards stabilizing electricity supply in the institution.

Okocha, Eyiolorunshe and Owolabi (2017) also examined student perception and acceptance of Computer Based Testing at Landmark University. Analyzing a total of 168 questionnaire using descriptive analysis and regression analysis carried out with the Statistical Package for Social Science Software (SPSS), the findings revealed that the acceptance rate of Computer Based Testing by students is high, though majority of the students were in support of training prior to taking assessments. Also, the acceptance rate of physics and Chemistry assessment were relatively low compared to other courses. The study also discovered gender differences in the acceptance of CBT and that college of study determined the acceptance of CBT. It recommends that university

administrators should ensure that assessments align with the international guidelines for computer testing and also there is the need to consider the interface design in Physics and Chemistry assessments.

Adekunle, Adepoju and Abdullahi, (2015) investigated the perception of students on computer utilization and academic performance in the North-Central geopolitical zone of Nigeria. It used of descriptive research with emphasis on survey design. The population comprised all colleges of Education in North Central geopolitical zone of Nigeria: made up of six states and FCT-Abuja; out of which six colleges were selected as sample. Using a 20-item questionnaire, Chi-square and ANOVA statistical analysis, the results reveal that there was positive perception of computer utilization on students, academic performance in the selected zone. It recommended that seminar and workshops on computer utilization should be organized for the lecturers and the students to facilitate active effective learning.

The above review showed that little or no research effort has been directed towards assessing the impact of prior knowledge of ICT on the CBT performance of students in Nigerian higher institutions. Bowman and Nomshi (2017) reviewed the importance of early training of young Nigerians in any skill in their paper titled: Primary Education, Technical Vocational Education, Training and Revamping Depressed Economy in Nigeria. The paper centered on the need for the students having adequate background knowledge in skilled professions such as the TVET. The paper condemned the Nigerian government lifestyle of a 'quick fix' method of solving challenges in the country. They finally opined a long training process to revamping economy of Nigeria. They recommended proper and adequate funding of the educational sector. They concluded with a longtime training of the students in skilled profession studies in Nigeria primary schools.

METHODOLOGY

The study was designed to test the effects of prior knowledge of computers on students' performance in computer-based examinations. It also examined attitude and perception of students towards CBTs. A questionnaire entitled "An Assessment of the Effects of Prior Knowledge of Computer on the CBT Performance of Students" was developed for this purpose. A four-point Liker-type scale of agreement running from (1= Strongly Disagree, 2= Disagree, 3= Agree and 4= Strongly Agree) was adopted. The content and face validity of the questionnaire was confirmed by two external researchers who are experts and specialists in this field; there comments were considered in the final version. After investigating the measures of content and face validity, the questionnaire was analyzed for the purpose of reliability. The reliability of the questionnaire was made possible through pilot testing. It was pretested on ten students in order to measure the construct validity of the perception measurement. The results of pilot testing confirmed that the questionnaire is reliable.

The study population comprised 120 undergraduate students of the Federal Polytechnic, Ilaro who had taken CBT entrance exam and are still taking CBT exams in their various departments. They are 100 – 400 level students selected from the five schools of the polytechnic namely Pure and Applied Science, Management Studies, Environmental Studies, Engineering and Communication

and Information Technology. There was no gender difference, male and female students both participated in the study.

The questionnaire contained four main parts. Part one collected demographic information about the participants. Part two asked questions about the use and practices. Part three asked questions about respondents' attitudes to the use of computer for testing. Finally, Part four gathered information about difficulties facing students in using computer for CBT. Most of the questionnaires were close ended, with an additional section for open ended questions and respondents' opinions. Respondents had enough time to complete the task. Respondents were informed that the information they provided arre kept confidential, and only for research purposes. The 120 Questionnaires were distributed randomly in the campus based on accessibility.

Data Presentation

An overview of the respondents' responses across the 3 schools: Pure and Applied Sciences, Management Studies, and Engineering.

Table 1: Divergences in the respondents' prior knowledge and use of the computer/Internet

S/N	SECTION A: Prior Knowledge and Use of the Computer/Internet	SA	A	D	SD	UD
1.	Internet is a common tool for communication and socialization	79.3	20.7	0	0	0
2.	Internet is becoming the main media for communication	46.6	53.4	0	0	0
3.	Internet is mainly used for the purpose of learning	46.6	37.9	15.5	0	0
4.	I started using computers before gaining admission into the polytechnic	30.2	52.6	17.2	0	0
5.	I know how to boot and shut down a computer	33.6	47.4	15.5	1.7	1.7
6.	I know how to send and receive mails via computer	46.6	37.9	15.5	0	0
7.	I know how to type alphabet and word on the computer	81.3	18.7	0	0	0
SECTION B: FAMILIARITY with ICT and CBT (Please indicate as for section A)						
8.	I have mastered the rudiments of ICT	37.1	23.3	25.9	8.6	5.2
9.	ICT is part of my everyday life activities	48.3	44.8	3.5	3.5	0
10	ICT is used in conducting examinations in higher institutions	40.0	37.9	18.3	3.8	0
11.	CBT captures all aspects of examination better than traditional examination type	23.1	39.7	19.5	17.7	0
12.	ICT is adequate and applied in the Nigerian examination context	30.7	34.1	20.3	8.3	6.6
13.	CBT is more difficult than pen-and-paper mode of examination	17.6	26.9	34.5	10.5	10.5
14.	CBT is an interesting mode of examination	22.4	17.2	18.9	25.8	15.5
15.	I have never been exposed to Computer-based Examinations	3.4	17.7	41.0	37.9	0
16.	CBT is strange to me	3.6	17.5	43.9	35.0	0

17.	I have been subjected to CBT at my secondary school or job search interviews before gaining admission	41.9	37.0	3.7	17.4	0
18.	CBT should replace pen-and-paper mode of examination	48.3	10.3	29.3	10.3	1.7
SECTION C: Attitudes of Students towards CBT (Please indicate as for section B)						
19.	CBT is necessary for examining students understanding	51.0	37.0	10.3	1.7	0
20.	The use of CBT can be considered a sure and true method of testing knowledge	35.8	27.4	16.2	18.9	1.5
21.	I am usually anxious about CBT	19.5	39.7	23.1	10.7	7.0
22.	I am more at home with CBT than with any other form of examination	44.8	34.5	6.9	5.1	8.6
23.	I do not consider CBT a valid test of knowledge	17.2	17.9	37.8	25.6	1.3
SECTION D: Assessing the Quality and Use Of CBT(Please indicate as for section C)						
24.	CBT should become the only form of testing knowledge	1.7	3.4	39.7	44.8	10.3
25.	I have at least one social media account such as email, facebook, twitter, whatsapp, etc	76.3	18.7	2.0	3.0	0
26.	I study only online materials written in English					
27.	I visit the pages everyday	36.9	30.0	17.9	1.7	1.7
28.	I know the meaning of the following internet acronyms (PCM, ROTFL, ASAP, BRB, FTF, FYI, etc.)	52.6	30.2	17.2	0	0
29.	There are known serious solvable challenges posed by CBT	48.3	44.8	4.5	2.5	0
30.	I have encountered power failure during CBT	17.2	22.5	31.0	25.9	3.4
31.	Power failure is a big challenge to CBT in my institution	34.5	26.9	17.6	14.5	6.5
32.	The Limitations on the usage of the CBT include	10.1				
	System security	15.9				
	Software Access	12.3				
	Answers submitting	27.7				
	Log in problems	23.6				
	Answers editing	10.4				

RESULTS AND DISCUSSION

Table 1 presents divergences in the respondents' prior knowledge and use of the computer/Internet while Table 2 presents respondents' familiarity with ICT and CBT. Table 3 presents attitudes of students towards the use of CBT while Table 4 presents an assessment of the quality and use of CBT. This also includes the problems and limitations on the usage of the CBT. Statistical details in tables are also presented. A comprehensive list of the test items is attached as an appendix.

As stated above, Table 1 reveals prior knowledge and use of computer/Internet by the students. This invariably accounts for their attitudes, dispositions and overt behaviour. From the data collected, it is evident that the entire population accepts that the Internet is a common tool for communication and socialization, strongly agree at 79.3% and agree at 20.7%. This corroborates the popular behaviour among youths who always have their phones or computers handy. In the

same vein, a total of 46.6% and 53.4% of the population regard Internet as becoming the main media for communication. It implies that more than any other forms of communication, the Internet is accepted by all the respondents as the emerging main means of communication. This assumption is strengthened by the fairly high percentage of the population, 84.5%, who regard Internet a tool mainly used for the purpose of learning. It is only a small percentage (15.5%) who disagreed. Surprisingly, a high percentage of the population (82.8%) accepts to have started using computers before gaining admission into the polytechnic while just 17.2% states that they have not used computers before gaining admission. This implies that majority of population are computer literates and as such may not have much issues with computer-based examinations. This assumption is corroborated by the entire who accepts that they all know how to type alphabet and word on the computer. However, it is interesting to note that relatively low number of the respondent, about 17.2 of the population disagree that they do not know how to boot and shut down a computer while 15.5 do not know how to send and receive mails via computer. Only 1.7% is undecided.

Table 2: Percentage Frequency of Familiarity with CBT and CBT (Based level of Study)
Table 2a: I have mastered the rudiments of ICT

Sample population	Percentage Frequency of Occurrence				
	SA	A	D	SD	UD
400 Level	13.6	44.7	28.9	12.6	0
300 Level	12.9	29.4	46.5	11.8	0
200 Level	31	32.8	16.7	16.7	2.2
I00 Level	0	50	25	0	25

Table 2b: CBT is more difficult than pen-and-paper mode of examination

Sample population	Percentage Frequency of Occurrence				
	SA	A	D	SD	UD
400 Level	0	84.2	13.2	0	2.6
300 Level	11.7	29.4	47.1	11.7	0
200 Level	22.2	33.3	22.2	16.7	5.6
I00 Level	0	50	25	0	25

Tables 2a and 2b reveal a fairly high level of their familiarity and acceptance of CBT and CBT: 64.9% of the population accepts that they have mastered the rudiments of ICT, countering the 54.8% who regard CBT as more difficult than pen-and-paper mode of examination. 400 level students are in the majority, 84.2% of the population of 400 level students followed by 50% of the

population of 100 level and 33.3 % of the population of 200 level students. This thus suggests that most of the students are computer literate.

Table 2c: CBT should replace pen-and-paper mode of examination

Sample population	Percentage Frequency of Occurrence				
	SA	A	D	SD	UD
400 Level	21.0	26.3	31.6	15.8	5.3
300 Level	11.7	47.1	29.4	5.9	5.9
200 Level	38.9	33.3	22.2	5.6	0
I00 Level	0	25	50	0	25

Table 2d: CBT is strange to me

Sample population	Percentage Frequency of Occurrence				
	SA	A	D	SD	UD
400 Level	10.5	21.0	36.8	15.7	15.7
300 Level	0	23.5	29.4	29.4	17.6
200 Level	5.6	11.1	22.2	50	16.7
I00 Level	0	0	50	25	25

Tables 2c and 2d above revealed that 59.2% of the population does in fact want CBT to replace pen-and-paper mode of examination while 56.9% disagrees that CBT is strange to them. It is of interest to note that though the tables reveal that while 400 level students may regard CBT as more difficult than pen-and-paper mode of examination, they do not have a consensus opinion as to whether it should replace pen-and-paper mode of examination. 47.4% of the 400 level students does not agree that CBT should replace pen-and-paper mode of examination whereas 47.3% does. 64.8% of the entire population believes that ICT is adequate and applied in the Nigerian examination context whereas a fairly low population of 39.6% accepts that CBT is an interesting mode of examination. The implication of this is that though they accept that ICT is necessary in conducting examinations, it still has some challenges.

Table 3: Attitudes of Students towards the Use of CBT across the three programmes

Table 3a: The use of CBT can be considered a sure and true method of testing knowledge

Sampled Population	SA	A	D	SD	UD
Pure and Applied Sciences	45.9	26.5	25.3	2.3	0
Management Studies	35.5	63.5	1.0	0	0
Engineering	65	27	3	3.5	1.5

Table 3b: I am usually anxious about CBT

Sampled Population	SA	A	D	SD	UD
Pure and Applied Sciences	53.8	31.2	4.3	0	10.7
Management Studies	41.7	52.1	6.2	0	0
Engineering	43.9	51.0	5.1	0	0

Table 4: An Assessment of the Quality and Use Of CBT

Table 4a: I have at least one social media account such as email, facebook, twitter, whatsapp, etc

Sampled population	SA	A	D	SD	UD
Pure and Applied Sciences	47.0	32.0	18.4	2.4	0
Management Studies	68.4	31.6	0	0	0
Engineering	75.1	16.7	4.2	4.0	0

Table 4b: There are known serious solvable challenges posed by CBT

Nigerian English is adequate for informal contexts only.

Sampled population	SA	A	D	SD	UD
Pure and Applied Sciences	29.0	51.6	19.4	0	0
Management Studies	34.7	36.8	23.6	4.7	0
Engineering	34.7	50	15.3	0	0

Table 4c**:** The Limitations on the usage of the CBT include

Limitations	SA	A	D	SD	UD
System security	20	50	30	0	0
Software Access	12	50	30	8	0
Answers submitting	8.3	70.8	0.2	0	0
Log in problems	0	53.7	16.1	0	30.1
Answers editing	21.5	64.5	3.2	0	10.7

CONCLUSION

This paper has analyzed the effect of prior knowledge in reading, communication and computer literacy skills on computer-based tests using the students of Federal Polytechnic, Ilaro as case study. It also examined students' perceptions and attitude towards the use of CBT. It is a fact that computer based test is a good innovative method of assessing students in examinations, However, lots of setbacks such as power failure, poor network connectivity, delay in the examination duration, absence of good infrastructure and inadequate trainees are still challenges to overcome.

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