

**COMPUTER BASED EXAMINATION (CBE) ON THE ACADEMIC PERFORMANCES
OF THE STUDENTS OF FEDERAL POLYTECHNIC ILARO.**

(A Study of the School of Management Students)

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Abstract

The central thrust of this research was to analyze the effect of computer based examinations on the academic performance of federal polytechnic Ilaro students. The data for this research study were obtained from primary source where a survey was carried out on the students of the school of management studies, Federal Polytechnic Ilaro 150 respondents were chosen as the sample size from HND II, and the data was analyzed using a frequency distribution method of analysis and chi square, from the findings it showed that 78% of the respondents agreed that implementation of computer based examination is more reliable and efficient over pen-on-paper examination. The paper therefore recommended that CBE should be adopted in all Courses offered in the institution because it reflects a broadband of outlines of courses.

Keywords: computer, examination, learning, performance, polytechnic, student.

1.1 Background to the Study

Information and Communication Technology (ICT) has become very essential in educational sector within a very short time as one of the basic building blocks for building quality educational system in Nigeria (Fagbola, Adigun & Oke 2013). Information communication technology adds value to the processes of learning, assessment of students and to the organization and administration of learning institutions.

The massive unethical practices such as examination leakages, demand for gratification by teachers, bribe-taking by supervisors and invigilators of examinations which have become a global phenomenon with its attendant effect on the general performance on students academic performance, in which student with low academic qualities can maneuver their ways to obtain high marks This menace has resulted to general fallen standards of education and Nigeria is no exception, particularly among developing nations.

There is need to adopt a mechanism to justify the academic performance of the students at tertiary institutions where Technocrats were been trained. The adoption of CBE is very crucial to solving the loopholes associated with traditional methods of students assessment which is pen-on-paper, the pen-on paper methods though posses certain benefits over the CBE which in actual fact has to be considered in Nigeria context, but the necessity for qualitative graduates in Nigeria Tertiary Institutions cannot be compromised, as technical education is the bedrock of any meaningful development a nation can boost of in which Nigeria desired.

CBE is the application of ICT technologies in an educational context with utmost desire to solve problems with low examination standard, poor question setting, unethical practices, and equally serves as a tool for supporting the various aspect of education such as teaching and learning, resources management (human, material, financial resources) and admission and examination processes also known as learning assessment.

One of the specific forms of ICT for fair assessment of students is the Computer-based testing, known as Computer-Based Assessment or e-assessment/testing. It is a method of administering tests in which the responses are electronically recorded, assessed, or both. It is commonly available for several admissions tests throughout the developed countries. CBE is defined as tests or assessments that are administered by computer in either stand-alone or dedicated network or by other technology devices linked to the internet or World Wide Web most of them using multiple choice questions (MCQs), (Sorana-Daniela and Lorentz, 2017).

Information technology through CBE has significantly transformed the method of assessment in many academic domains, academic evaluation/assessment or measurement is moving from Pencil paper test (PPT) to the use of Computer-based testing.

In Nigeria today, it is only Joint Admission and Matriculation Board that had fully exploit the CBE for its Universal Tertiary Matriculation Examination (UTME) to curb the menace of unethical practices associated with the Examination in the time past. Some institutions also adopted this system of examination measurement because of its attendant benefits in which the Federal Polytechnic Ilaro is part of such institution and thus a focus of this research paper

An effective method of students assessment technique is imperative in assessing student knowledge as a result of an increase in number of student intakes from newly introduced

programmes especially under the current Management headed by Arc. Aluko, O.O coupled with ever-escalating work commitments for academic staff, and the advancement of internet technology, the use of computer assisted assessment has been an attractive proposition for many higher education institutions (Darrell, 2013). Though, most tertiary institutions in Nigerian, still use the traditional method (a combination of essay examination and practical examination) as means to evaluate students' knowledge.

In the past few years, the number of students increased drastically and the conventional examination method has become time consuming in terms of the examination time for evaluation and assessment, and the best way to address time constraint in examination solution of evaluation of large classes of students is an automated testing system.

There are basically some courses that are presently on CBE in Federal Polytechnic Ilaro, especially in GNS courses like Citizenship Education I & II, Use of English, General Principles of Law and other courses like Mathematics and principles and practice of Entrepreneurship that are offered by the generality of students at ND and HND level, the adoption of CBE on this courses has generated contending views that students performed well in CBE courses than other courses that adopted the traditional method of Pen-on-paper. Thus, the need for this paper

The main objective of this research is to assess computer based examination on the performance of Federal Polytechnic Ilaro students, the specific objectives are to examine the effect of computer based exam on student academic performance of Federal Polytechnic Ilaro student, to evaluate the effect of computer based examination on eradication of student malpractices activities in Federal Polytechnic Ilaro and to examine the challenges of computer based examination on students' academic performance in Federal Polytechnic Ilaro.

Research Hypothesis

Hi: There is significant relationship between CBE and student academic performance in FPI

Hii: There is correlation between CBE and fair academic evaluation of students

Overview of Computer-based Assessment

The recent employment and eventual widespread acceptance of electronic test in examining students and various classes in Nigeria has created a significant impact in the trends of educational history in the country (Adebayo, 2014)

Computer Based Examination is defined as tests or assessments that are administered by computer in either stand-alone or dedicated network or by other technology devices linked to the internet or World Wide Web most of them using multiple choice questions (MCQs), (Sorana-Daniela and Lorentz, 2017).

Computer-based testing has emerged as one of the recent “innovative” approaches to assessments most pursued by tertiary institution in Nigeria. Computer based examination is lauded as the answer to having cheaper and speedier test delivery for students assessment.

There is a great transformation from the traditional mode of assessment to the modern method of the use of Computer-based test. Computer-based testing is gaining popularity over the traditional paper-and pencil test (PPT) due to many advantages that computer based assessment provides. Meanwhile, more educators and researchers have shown interest in investigating the factors that influence students’ computer based examination performance. There are many factors related to student characteristics, which include student demographic attributes, learning style, computer familiarity and test anxiety.

According to Fyfe (2015), it has been found that testing format does not affect test scores therefore computer based examination can be considered a valid and acceptable testing mode. As computer based examination began to be used for summative assessment, it is therefore important to establish whether computer based testing is comparable to that of paper based test. Researchers have performed large scale reviews of studies examining differences in performance of computer based examination and paper-based version of tests and have generally found that when computer based examination is similar in format to pencil and paper tests, it has little if any effect on test performance (Darrell, 2013). From students' perspective of the computer based examination there have been a number of mixed reactions.

Need for Computer-Based Examination

Generally, advantages of CBT systems over traditional paper-and-pencil testing (PPT) have been demonstrated in several comparative works and as mentioned by (Peter, C. Bill, I., & David, S. (2004).), CBT is not just an alternative method for delivering examinations, it represents an important qualitative shift away from traditional methods such as paper based tests. Despite, these advantages available in computerized test administration as it was shown that, it does not mean that CBTs are intrinsically better than paper-and-pencil tests John, C.K., Cynthia, G.P., Judith, A.S., & Tim, D. (2002). Previous study by (Fyfe, G., Meyer, J., Fyfe, S., Ziman, M., Sanders, K., & Hill, J. ()) have even found that testing format does not affect test scores and as such CBT can be considered a valid and acceptable testing mode

According to Scheuermann & Björnsson (2011) technological innovation and new requirements posed by the global economy are affecting the performance of educational systems. Societal and structural changes urge educational reforms in many countries where given traditional education seems to not meet the needs of educational institutions and individuals. Advances achieved with integration of educational technology into teaching and learning and new pedagogical

approaches enhance the capacities to update to new modern technology. The Challenge educational policy makers is to ensure a good match of increasing potentials with skills needed by modern society. Research findings revealed the necessity to incorporate different learning styles into the educational assessment in order for a more accurate and meaningful outcome to be achieved (Ayre & Nafalski, 2010).

Benefits and Risks of Computer-based Assessments

There are many benefits to Computer-based testing such as immediate results, the ability to build in accommodations for those students who have special needs and efficiency. Shavelson (1999)

With e-assessments it is possible to test areas of knowledge, skills and understanding that would be impossible using pen-and-paper-based testing. van Lent(2013) identified that the educational benefits anticipate the closing the gap between assessment and learning.

Computer-based assessments can be more easily designed to meet the needs of special populations, including students with disabilities and those from diverse linguistic backgrounds (Gamire & Pearson, 2013).

Electronic delivery is also less expensive than printing and mailing large quantities of testing materials. In addition, errors found in test booklets or answer sheets can be quickly and easily corrected, instead of reprinting and reshipping testing materials at considerable expense (Bridgeman, 2011; van Lent, 2011; Bennett, 2013; Choi & Tinkler, 2012).

Electronically-based examinations have – especially where there is a growing exam intake – the following advantages for tutors and students:

- Automatic marking not only saves a significant amount of time for tutors and gives a very rapid result for the examination, but also has a high degree of objectivity.

- In the case of free-text exercises and other open types of question the legibility of the answers makes the non-automatic marking much easier, whilst non-dependence on individual handwriting again increases objectivity.
- Students can amend their answers as often as they like without “leaving tracks” and handing in confusing or barely legible worksheets.
- There are many different types of question available, which can be “enriched” with various media (images, video sequences, audio files, animations) in high quality.
- Allocation to sets of questions (e.g. themed) and automatic item analysis (e.g. difficulty and selectivity) simplify repeated use and quality management of the examination content.
- Combined use of the e-examination system with specialist applications promotes the testing of skills and practical competencies (e.g. for programming tasks or Internet and database research).

Therefore electronically-based examinations contribute both to economising on the realisation of summative examinations and to improving their quality, it also means it is possible to prepare examination content for formative e-assessments. This allows for instance students’ learning and progress on the course to be checked with online exercises and targeted preparation of summative examinations.

Electronically-based testing places special demands on the technical, organisational, legal and examination framework:

Technical Reliability

The technical infrastructure must be reliable enough to ensure that there is no risk of examination

data loss. Providing a sufficient number of workstations that can be used in parallel should prevent the need for repeated examination sittings requiring the costly preparation of equivalent exercises.

Legal security

There are high legal standards also in regard to fraud proofing and the prevention of tampering, equal opportunities for all examinees, and archiving of the examination results, and accordingly allowance must be made for these in the examination regulations.

Quality of questions

A major reason for scepticism about the worth of e-examinations is their reputed restriction to closed questions that can be automatically analysed. This is supposed to mean that it is only possible to examine factual knowledge, resulting in a reduced quality of examination. Higher cognitive processes such as comprehension or application can however now be allowed for with the broad spectrum of differing [types of question](#) of the examination system and careful construction of closed questions. Adaptation of the available types of question to the learning-oriented examination contents in comparison to normal examinations means greater work for the tutors in the preparatory phase, however it equally calls for greater consideration to be paid to the desired examination quality.

Working with the examination system

Moreover, in order to prepare the sets of questions and examinations the tutors must be familiar with the operation of the [examination system](#). In order to simplify this, an examination system is

being used that is derived from the learning management system in use at the University of Göttingen and therefore already familiar to many tutors.

Computer-based Examination and Student Academic Performance

Not every student has the ability to succeed when placed in front of a computer and asked to perform a task. Ricketts and Wilkes (2011) suggest that the performance of students needs to be carefully monitored to ensure that any changes in delivery are seen to be fair and consistent and that the use of computer-based assessment is generally acceptable to students, who particularly appreciate the speed of marking and feedback. However, the acceptability to students is highly influenced by the way in which questions are presented. Thus, presentations which require scrolling are less acceptable than those in which questions are presented one at a time.

Bransford (2010) suggested that the learning environment must consider centralization in assessment, in particular to value formative assessment. Higgins, Russell, and Hoffman (2015) found that on average, students who were categorized as high home computer users scored lower on a reading comprehension test while students who were categorized as medium level home computer users scored highest.

Higgins, Russell, and Hoffman (2015) concluded that scrolling negatively affects students with low computer skills and knowledge, but that more research would need to be done to get a more vivid picture of the impact of different types of computer-based assessments.

It is not just that computer-based assessments may affect the way that students learn but it is also the type used that also has an effect. Whether students are able to see whole passages or the assessment requires scrolling will affect their performance.

There is possibility of guest work by some students who will just gamble in selecting the answer from the options and scored higher than students who try to be careful in choosing the answer.

Empirical Review

Garas & Hassan (2018) examine student performance on computer-based tests versus paper-based tests. The study, therefore, ascertains whether the mode of student testing (computer-based or paper-based) in an introductory-level financial accounting course impacted students' scores (a direct measure of learning). The sample consists of 78 students undertaking financial accounting courses at Zayed University during the summer semester. A simple difference in mean statistics test shows that there is no statistically significant difference between the students' paper-based and computer based scores. However, benchmark regression analysis showed that males performed better than females on computer based examination, and females outperformed males on PBT. The paper provides evidence from the Gulf region as of how technology-based assessment is affected by the gender, which matter needs to be addressed by university instructors working in Middle East universities.

Oduntan, Ojuawo & Oduntan (2015), investigate comparative analysis of student performance in paper pencil test (PPT) and computer based test (CBT) examination system. A correlational analysis of computer based examination and paper and pen test assessment method was used.

Result showed a positive correlation in the scores of student, it is therefore concluded that, if students are well prepared for the computer based examination exams, their performance will be enhanced.

Achimugu, Oluwagbemi & Oluwaranti (2014), evaluate the impact of ICT diffusion in Nigeria higher education. Higher education is approaching the point at which Science and Technology particularly Information and Communication Technology (ICT), plays a vital role in nearly all

phases of the educational process. This paper focuses on how ICT diffusion has impacted the higher educational sector positively in Nigeria. The research also exposes the effect of ICT diffusion on undergraduate and postgraduate students of Nigeria's tertiary institutions. A combination of observation, interview and document materials for data gathering was employed as methodology for carrying out this research. The result of the research suggests that ICT is becoming a driving force for educational reforms and that ICTs have become an integrative part of national education policies and plans in Nigerian tertiary institutions.

Fagboola, Adigun & Oke (2013), examine computer based test system for university academic enterprises examination Computer Based Test (CBE) is an effective solution for mass education evaluation. The system is designed to facilitate the examination processes and manage challenges surrounding the conduct of examination, auto-submission, auto-marking and examination result report generation. The computer based examination system was evaluated at the Federal University, Oye-Ekiti, Ekiti State prometric centre. Performance assessment was carried out by two-hundred and fifty (250) volunteer users of the computer based examination system and the average performance scoring indicate that the system scores high in terms of reliability, robustness and flexibility with easy to use graphical user interface. The volunteers comprise of software developers, students, lecturers and network engineers. The test proved the validity of using this web-based computer based examination system to evaluate a large mass of students in various institutions of learning across the globe.

Method of Data Analysis

The collected data was analyzed based on descriptive statistics using a frequency distribution method of analysis and chi square, and a sample size of 150 respondents were selected from HND II level students from the school of Management studies, Federal Polytechnic Ilaro

PRESENTATION OF RESULTS

Implementation of computer base examination is more reliable over paper and pencil test.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Agreed	46	30.7	30.7	30.7
Agreed	66	44.0	44.0	74.7
Disagreed	24	16.0	16.0	90.7
Strongly disagreed	14	9.3	9.3	100.0
Total	150	100.0	100.0	

Source: Field Survey August, 2018

The table above shows that 46 (30.7%) of the respondents “Strongly Agreed” Implementation of computer base examination is more reliable over paper and pencil test, 66 (44%) of the respondents “Agreed”, 24 (16%) of the respondents Disagreed , while 14 (9.3%) of the respondents “Strongly Disagreed”. From the result obtained, it was observed that majority of the respondents “Agreed” to the fact Implementation of computer base examination is more reliable over paper and pencil test

Implementation of computer based examination attracts student commitment to academic.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Agreed	96	64.0	64.0	64.0
Agreed	54	36.0	36.0	100.0
Total	150	100.0	100.0	

Source: Field Survey August, 2018

The table above shows that. 96 (64%) of the respondents “Strongly Agreed” that Implementation of computer based examination attracts student commitment to academic, 54 (36%) of the respondents “Agreed”. From the result obtained, it was observed that majority of the respondents “Strongly Agreed” to the fact that Implementation of computer based examination attracts student commitment to academic.

Implementation of computer based examination trains student with time management during learning period.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Agreed	61	40.7	40.7	40.7
Agreed	32	21.3	21.3	62.0
Disagreed	37	24.7	24.7	86.7
Strongly disagreed	20	13.3	13.3	100.0
Total	150	100.0	100.0	

Source: Field Survey August, 2018

The table above shows that. 61 (40.7%) of the respondents “Strongly Agreed” that Implementation of computer base examination training student with time management during learning period, 32 (21.3%) of the respondents “Agreed”, 37 (24.7%) of the respondents Disagreed while 20 (13.3%) of the respondents “Strongly Disagreed”. From the result obtained, it was observed that majority of the respondents “Strongly Agreed” to the fact that Implementation of computer base examination training student with time management during learning period.

Implementation of computer base examination ensures optimum transparency in student examination conduct.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Agreed	46	30.7	30.7	30.7

Agreed	40	26.7	26.7	57.3
Disagreed	44	29.3	29.3	86.7
Strongly disagreed	20	13.3	13.3	100.0
Total	150	100.0	100.0	

Source: Field Survey August, 2018

The table above shows that. 46 (30.7%) of the respondents “Strongly Agreed” that Implementation of computer base examination ensures optimum transparency in student examination conduct, 40 (26.7%) of the respondents “Agreed”, 44 (29.3%) of the respondents Disagreed while 20 (13.3%) of the respondents “Strongly Disagreed”. From the result obtained, it was observed that majority of the respondents “Strongly Agreed” to the fact that Implementation of computer base examination ensures optimum transparency in student examination conduct.

Table 4.1.12: Implementation of computer base examination eradicated delay in preparation student examination.

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Agreed	24	16.0	16.0	16.0
Agreed	32	21.3	21.3	37.3
Disagreed	62	41.4	41.4	78.7
Strongly disagreed	32	21.3	21.3	100.0
Total	150	100.0	100.0	

Source: Field Survey August, 2018

The table above shows that. 24 (16%) of the respondents “Strongly Agreed” Implementation of computer base examination eradicated delay in preparation student examination, 32 (21.3%) of the respondents “Agreed”, 62 (41.4%) of the respondents Disagreed while 32 (21.3%) of the

respondents “Strongly Disagreed”. From the result obtained, it was observed that majority of the respondents “Disagreed” to the fact that Implementation of computer base examination eradicated delay in preparation student examination.

Chi Square Analysis on the Assessment of Computer Based Examination on the Academic Performance of the Students of Federal Polytechnic Ilaro

Chi Square Table

O	E	O-E	(O-E) ²	(O-E) ² /E
46	71.8	-25.8	665.64	9.27
66	53.8	12.2	148.84	2.77
24	17	7	49.00	2.88
14	7.4	6.6	43.56	5.89
96	71.8	24.2	585.64	8.16
54	53.8	0.2	0.04	0.00
0	17	-17	289.00	17.00
0	7.4	-7.4	54.76	7.40
61	71.8	-10.8	116.64	1.62
32	53.8	-21.8	475.24	8.83
37	17	20	400.00	23.53
20	7.4	12.6	158.76	21.45
102	71.8	30.2	912.04	12.70
48	53.8	-5.8	33.64	0.63
0	17	-17	289.00	17.00
0	7.4	-7.4	54.76	7.40
54	71.8	-17.8	316.84	4.41
69	53.8	15.2	231.04	4.29
24	17	7	49.00	2.88
3	7.4	-4.4	19.36	2.62
				160.74

Source: Field Survey, 2018.

The study attempted to validate the hypothesis that claims Computer Based Examination has no significant effect on the academic performance of the students of Federal Polytechnic Ilaro, but the result as show in table 4.1.16 revealed that academic performance of students of federal polytechnic Ilaro is dependent on computer based examination i.e there is a significant effect of Computer Based Examination on the academic performance of the students of federal polytechnic Ilaro, since calculated $\chi^2_{cal} > \chi^2_{tab}$ ($\chi^2_{cal}= 160.74$, $\chi^2_{tab}= 30.14$, $df=19$). Therefore,

computer based examination has significant effect on the academic performance of the students of federal polytechnic Ilaro.

Interpretation of Results

From the analysis above it shows that majority of the respondents strongly agreed that implementation of computer base examination is more reliable than paper and test, also implementation of computer base examination ensures optimum transparency in student examination conduct. The respondent also agreed that implementation of computer base examination reduces students malpractices activities during examination period. The test of hypothesis affirmed that computer based examination has significant effect on the academic performance of the students of federal polytechnic Ilaro, Ogun State.

Conclusion

This research assessed computer based exam on the performance of federal polytechnic student. From the finding it was concluded that computer based examination enhance academic performance in Federal Polytechnic Ilaro. Student found the use of computer based examination as an easy and efficient means of evaluating their academic performance in the institution.

Secondly, it was concluded that implementation of computer based examination eradicates student malpractice activities during course of paper and pen examination in Federal Polytechnic Ilaro.

Lastly, it was concluded that that computer based examination pose a great challenges to some student who has little or no computer knowledge which has result to poor academic performance despite their intellectual quotient.

Recommendations

From the above findings the following recommendations were put forward;

- i. CBE should be adopted in all Courses offered in the institution because it reflects a broadband of outlines of courses.
- ii. The school should provides enabling infrastructural facilities such as stable power, uninterrupted internet service..
- iii. Government should allocate more fund to Tertiary institutions to cater for CBE in Nigeria
- iv. Generally, the government policy on computer education at the primary and secondary school levels should be reinforced to make all students computer-literate.

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