Prospective Chemistry Teachers Perception Of Factors Influencing Computer-Based Test (CBT) Examination In Anambra State Colleges Of Education.

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Abstract
The study investigated using descriptive survey design, prospective chemistry teachers' perception of factors influencing computer-based testing (CBT) examinations in Colleges of Education in Anambra State. The population as well as the sample comprised of 183 degree chemistry student-teachers from Nwafor Orizu College of Education, Nsugbe and Federal College of Education (T) Umunze, in Anambra State. No sampling was done, all the student-teachers in the two schools were used, since, the population is considerably adequate. A validated CBT questionnaire known as Prospective Chemistry Teachers Perception of Factors Influencing CBT Examination (PCTPFICBTE) with reliability index of 0.78 using Cronbach alpha was administered to collect data from the respondents. The study was guided by three research questions, and one hypothesis which was tested using z-test at 0.05 significant level. Data were analysed using mean and standard deviations. Findings revealed that the perception of prospective chemistry teachers of factors influencing CBT examinations were high. They perceived that all the listed factors influence CBT examination, power failure and server break-down among others were found to be the major difficulties facing the teacher trainees in using CBT in both schools. It was also found that the prospective chemistry teachers do not differ in their perception of factors influencing CBT examinations. The study recommended among others the need for school administrators to find lasting solutions to the difficulties facing their use of CBT facilities through concerted efforts. Also prospective chemistry teachers should be sensitized and provided with conducive learning ICT environment since change is inevitable in every organization.

Keywords: *Prospective Chemistry Teachers, Perception of Factors, Computer-Based Test, Anambra State Colleges of Education.*

Introduction

The success of an educational enterprise particularly, in terms of equality depends to a very large extent on adequate supply of teachers who are versatile, compliant and competent in the use of modern means of instruction and learning.

Teacher education revolves around the process and procedures designed to equip teachers with knowledge, skills, attitude and behaviours required for effective performance of their duties in the classrooms and in other social gatherings as well as providing knowledge and skills as updates for the qualified teachers in form of continuous professional development. One of such new skills necessary for acquisition in the 21st century classrooms is information and communication technology (ICT) compliance. Teachers who are the pivot upon which education rests cannot lag behind in technology development especially those which affect their day-to-day assignment. The recent development in ICT which has influenced different areas of specialization did not spare education. ICT focuses specifically on the application of computer technologies in educational context and environment and serve as tools for supporting the various components of education. Such components include teaching and learning, resource management (human and financial resources), admission and

examination/learning assessment processes. One specific form of ICT for assessment purpose is the computer-based testing (CBT) also known as computer-based assessment or e-examination.

Assessment is central to the process, principles and practice of education, assessment approaches provide the ways to measure individuals and institutional success and so can have profound driving influence on the individuals and institutions they were design to serve (Adebola, Ifamuyiwa and Olusola, 2016). Through assessment, teachers are able to identify students' areas of weakness, and students themselves are able to identify their areas of deficiencies. Assessment also provide for teachers and schools evidence of success for individuals and institutions.

Computerized testing methods were first introduced over 60years ago (Omotechinwa, Durojaiye and Samson, 2015). Computer-based test (CBT) is a method of administering test in which the responses are electronically recorded, assessed or both. CBT provides powerful tool to meet the new challenges of designing and implementing assessment methods that go beyond the conventional practices which facilitates a broader repertoire of cognitive skills and knowledge (Arista and Kuswanto, 2018). In the past, various methods were employed in examining the ability of an individual, ranging from oral to written, practical to theoretical and paper and pencil to electronic.

CBT through Information and Communication Technology (ICT) uses computer electronic system to assess learning as against the conventional manual or paper and pencil method. The paper-pencil method has been reported to have been marked by continuous examination malpractices ranging from leakage of question papers, impersonation, demand for gratification in cash and kind to bribe-taking by supervisors and invigilators of examinations (Olawale and Shafil, 2018). The traditional method of testing students in Nigeria is characterized by different forms of examination malpractice such as bringing unauthorized materials, writing on currency notes and identity cards, spying of other candidates in examination hall, substitution of answer sheets and change of examination scores and grades (Mubashrah, Tariq and Shami, 2012). Others include, connivance with supervisors and school authorizes to cheat, writing on parts of the body, for example, some students especially females write on hidden parts of their bodies. (Adamu, 2022).

The advancement in technology and the endless search for alternative means of assessing students that is void of examination malpractice are few of the many reasons why CBT was introduced in Nigeria. The use of CBT gained national popularity in Nigeria when it was first used by the Joint Admission and Matriculation Board (JAMB) in 2013, in the conduct of enhance examination to higher institutions of learning for some students by choice. Since, then JAMB has been using CBT for its examinations nationwide. Other institutions have since adopted CBT as assessment tool for post UTME or school-based examinations.

Ojerinde (2012) opined that the main objective of the CBT was to ensure 100% elimination of all forms of examination malpractice that had been a major challenge in the conduct of public examination in the country. He further highlighted the advantages of CBT over traditional form of testing to include the fact that, while the traditional paper-pencil tests could only test cognitive outcomes, which is just one of the domains of learning in education, the CBT has the advantage of capturing both the cognitive, affective and psychomotor domain of learning through the assessment of students' practical skills in computer application and appreciation. CBT also provide novel means of assessing students in an innovative way with the expectation that it is capable of curbing examination malpractice that has eaten deep into the fabric of our education system. CBT is expected to reduce teachers stress of marking and grading scripts manually where the examiners are very large in number especially in general study courses. In addition, CBT aids independent work

with integrity since students are expected to face squarely their computer system while using the CBT examination purposes. CBT is also expected to help reduce the incidence of result falsification and manipulation by lecturers and staff (Ojediran and Oludipe, 2019).

Apart from the fact that it has become the medium of examination for JAMB in conducting examinations and post UTME tests, the CBT is fast becoming the choice of most tertiary institutions in Nigeria for assessing their students. Research reports from students perception of CBT revealed that very few students are confident about CBT preference as assessment tool due to some factors (Adebiyi and Ekong, 2017, Williams, 2017 and Wilder, 2022). Ayo (2019) reported increased anxiety among students unfamiliar with the use of computer, while Johnson (2021) opined that students are technophobic, inspite of the huge benefits associated with CBT and concluded that there may still lies the challenges of acceptability of CBT among end-users in education. These problems associated with the use of CBT may have accounted in part for prospective teachers perception of CBT acceptance as a reliable assessment tool, since the would-be teachers are expected to conduct similar assessment on students in the nearest future. It thus, become necessary to determine the factors influencing prospective teachers perception of CBT as a means of assessment in institutions of higher learning especially colleges of education in Anambra state.

Research Questions

The following research questions guided the study.

1. What are the prospective chemistry teacher perceptions of factors influencing CBT examinations?
2. What major difficulties do prospective chemistry teachers face in the use of CBT assessment tools in their institutions?
3. Is there any difference in Nwafor Orizu College of Education, Nsugbe prospective chemistry teachers' perception of factors influencing CBT examination, with those of prospective chemistry teachers of Federal College of Education (T) Umunze?

Hypothesis

One null hypothesis guided the study.

There is no significant difference between Nwafor Orizu College of Education, Nsugbe prospective chemistry teachers' perception of factors influencing CBT examination, with those of prospective chemistry teachers of Federal College of Education (T) Umunze.

Research Method

The study employed a descriptive survey research design. The population consists of all the degree chemistry student-teachers of Nwafor Orizu College of Education, Nsugbe (NOCEN) and Federal College of Education (T) Umunze (FCEG) which had a total of 183 (NOCEN 88, FCE(T) 95). No sampling was done because all the population was used as the sample since the sample was considerably small. A 22- item questionnaire known as Prospective Chemistry Teachers Perception of Factors Influencing CBT examination questionnaire (PCTPFICBTEQ) was used as the instrument for collection of data.

A four point scale type of strongly agree, agree, disagree and strongly disagree as response option (representing 4, 3, 2, 1 respectively) was presented to two educational experts for perusal to ascertain its content and face vadility. The corrected instrument was trial tested using 85 degree prospective chemistry teachers of Federal College of Education (T), Asaba in Delta State using Cronbach alpha. This gave a reliability index of 0.78.

The PCTPFICBTEQ was administered on the prospective chemistry teachers of the two colleges of education using on-the-spot technique. All the completed questionnaires were retrieved, sorted and used for data analysis. Data were analyzed using mean scores and z-test at .05 level of significance, criterion mean of 2.50 and above indicates positive response (high perception), below 2.50 indicate negative

response (low perception).

Results

Research Question 1

What are the prospective chemistry teachers perception of factors influencing CBT examinations?

Table 1: The Prospective Chemistry Teachers Perception of Factors Influencing CBT Examinations

S/N	Factors	NOCEN N = 88	SD	FCE(T) Umunze N = 95	SD
1	Poor knowledge of ICT programmes and facilities in primary and secondary schools.	3.50	1.87	3.52	1.88
2	Poor supervision by computer trainers during training exercise.	2.92	1.71	3.50	1.87
3	ICT trainers do not give opportunities to interact with them before and after training.	3.21	1.79	3.06	1.75
4	Students are not well exposed to the training exercise before CBT examinations.	2.98	1.73	3.18	1.78
5	Trainers complain they are not motivated by the institution for the training exercise, and so do not show much interest in the training.	3.74	1.93	3.58	1.89
6	The training period is rather too short.	3.00	1.93	2.90	1.87
7	Inadequate infrastructural and ICT facilities.	3.34	1.83	3.32	1.82
8	Increased work load or course load on students.	3.56	1.78	3.74	1.78
9	Shortage of ICT personnels.	2.79	1.67	2.78	1.67
10	Time allotted in the school time table for the training programme is not enough.	2.83	1.68	2.79	1.67
11	Poor management of ICT training centre.	2.91	1.71	2.79	1.67
12	Lack of effective supervision by the school authority on ICT training centre.	3.16	1.53	3.20	1.53
13	Lack of effective monitoring by the school authorities on ICT trainers.	3.11	1.76	3.09	1.76
	Average Mean	**3.16**	**1.78**	**3.19**	**1.79**

The result in table 1 shows high perception of prospective chemistry teachers on factors influencing CBT examinations with items 1, 5 and 8 having the highest mean scores. The average mean scores of both prospective chemistry teachers perception of factors influencing CBT examinations is higher than the criterion mean of 2.50, this means that they perceived the listed factors as influencing their CBT examinations in both schools.

Research Question 2

What major difficulties do prospective chemistry teachers face in the use of CBT assessment tools in their institutions?

Table 2: Difficulties encountered by prospective chemistry teachers in the use of CBT assessment tools in their institutions.

S/N	Factors	NOCEN N = 88	SD	FCE(T) Umunze N = 95	SD
14	Majority of the lecturers teaching courses involving CBT are not computer literate.	3.40	1.79	3.36	1.80
15	Majority of the invigilators of CBT examinations are not computer literate and as such could not help, especially when a system develops a fault.	2.89	1.70	2.83	1.68
16	Consistent power failure	3.20	1.87	3.24	1.83
17	Stress getting to the examination hall.	3.02	1.74	3.00	1.73
18	Server breakdown.	3.48	1.87	3.48	1.87
19	Ineffective conduct of CBT examinations.	3.14	1.29	3.06	1.06
20	Computer (system) breakdown.	3.18	1.68	3.13	1.62
21	Test anxiety.	3.42	1.85	3.31	1.82
22	ICT language proficiency.	3.16	1.78	3.10	1.77
	Average Mean	**3.18**	**1.78**	**3.13**	**1.77**

Result in table 2 reveals the major difficulties encountered by prospective chemistry teachers in using CBT. The result indicated that show items 14, 16, 18, 21 are major difficulties encountered by prospective chemistry teachers in using CBT.

Research Question 3

Is there any difference in Nwafor Orizu College of Education, Nsugbe prospective chemistry teachers' perception of factors influencing CBT examination, with those of prospective chemistry teachers of Federal College of Education (T) Umunze?

Table 3: Mean Responses on Differences between Nwafor Orizu College of Education, Nsugbe Prospective Chemistry Teachers' Perception of Factors Influencing CBT Examination with those of Prospective Chemistry Teachers of Federal College of Education (T) Umunze.

School	N	X	SD	Mean Difference
Federal College of Education (T) Umunze	95	3.19	1.79	
				0.03
Nwafor Orizu College of Education, Nsugbe	88	3.16	1.78	

Table 3 indicates that average mean response of prospective chemistry teachers of FCE (T) Umunze is slightly higher than those of NOCE

Nsugbe with a mean difference of 0.03 in favour of FCE(T) Umunze. To show whether there is a significant difference, the hypothesis was tested.

Hypothesis 1

There is no significant difference between Nwafor Orizu College of Education, Nsugbe prospective chemistry teachers' perception of factors influencing CBT examination with those of prospective chemistry teachers of Federal College of Education (T) Umunze.

Table 4: Z-test comparison on mean scores of the two schools (NOCE, Nsugbe and FCE(T), Umunze on perception of factors influencing CBT examinations.

Variables	Number	Mean	SD	df	z-cal	z-crit
FCE(T) Umunze	95	3.19	1.79			
				181	0.089	1.960
NOCEN, Nsugbe	88	3.16	1.78			

The result in table 4 reveals a non-significant outcome of ($z = 0.089$, $p>0.05$). This implies that the observed difference in both schools on prospective chemistry teachers' perception of factors influencing CBT examinations is not statistically significant. Hence, the null hypothesis of no significant difference in the two schools on prospective chemistry teachers' perception of factors influencing CBT examinations is hereby retained.

Discussion of the Findings

Table 1 indicates that the listed factors are perceived by the prospective teachers as influencing their CBT examinations by both schools. The findings in this table especially item 1 collaborates with the findings of Sanni and Mohammad (2015) that most students are not yet aware of ICT and have poor knowledge of ICT before entering into institutions of higher learning. It also agrees with the study of Imo (2018) that the practical learning of ICT is not done in primary and secondary levels which are the foundations for entering into institutions of higher learning.

The findings indicate that students are not effectively supervised during the training exercise and that majority of the lecturers teaching general study courses are not computer literate. Also students are not adequately and effectively exposed to the training before embarking on the examinations. This is in line with the findings of Idowu (2017) that students are not given the opportunity to interact with their trainers during the training. The finding is also in line with that of Nakpodia (2015) who remarked that, during practical CBT programmes, some trainers do not have time to interact and discuss their observations and comments with the students. The brief discussions are always done in general and in a jiffy with no interpersonal or individual interactions.

The results in table 2 which revealed major difficulties facing prospective chemistry teachers in the use of CBT indicate power failure, server breakdown among others. This is in line with the findings of Green (2018) that the major problem facing CBT in schools is power interruption, this is not surprising because the country has no effective power connectivity which leads to server breakdown. The result in table 2 also shows that prospective teachers do not have access to computer with which they can practice before CBT examinations among others. This finding collaborates with findings of Russel (2023) that low performance of students in CBT can be trace to the students' inability to practice with computer before CBT examination. This outcome is not surprising as most prospective chemistry teachers do not possess personal computers with which they could practice and be guided on how to use the computer before using it for CBT examination. This outcome is in line with the findings of Adebiyi and Ekong (2017) who reported that only 18% of Nigerian university students were guided through the examination by prior exposure to the computer.

Conclusion

It can be deduced from the findings of this study that prospective chemistry teachers of both Colleges of Education in the state had high perception of factors listed as influencing CBT examinations. This could call to question the trainees professional competence as would-be teachers for the 21st century classrooms. The most challenge facing the prospective chemistry teachers in using CBT is server breakdown in examination hall which is an indication that there is still much work to be done by the administrative system of higher institutions if the objective of training is to prepare technologically sound teachers for the modern day classrooms.

Implications of this Study

The outcome of this study has implications for school administrators. School administrators would need to provide enabling environment that can cater for the projected number of prospective teachers whenever need be for CBT examinations and practice. The school administrators should give enough time for the mandatory information technology training (MITT) before allowing the prospective chemistry teachers to embark on the computer-based examinations.

Recommendations

Based on the findings, it is recommended that:

- Adequate and functional computers and ICT facilities should be procured to cater for students need to ameliorate the stress that students encounter before getting to the examination hall for CBT.
- Tutorial lectures should be organized for students to be exposed to computer appreciation and practice before CBT examinations. This will likely get them attracted to the system and its use, thus improve their performance in CBT examinations.
- Parents could be of help by procuring personal lap top or desk-top computers for their wards to afford them the opportunity of working with computer, appreciating it and using it for practice on regular basis before any CBT. Such familiarity with computer facilities will no doubt improve their expertise on computer.

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