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TITLE: INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) IN NIGERIA EDUCATIONAL ASSESSMENT SYSTEM: EMERGING CHALLENGES

BY

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Abstract

This paper examines Information and Communication Technology (ICT) in Nigeria educational assessment system with its emerging challenges. This is inevitable following the globalisation trend which has brought drastic changes in the world of technology. The essence of the paper is to describe the present status of ICT in the Nigeria educational assessment system coupled with its emerging challenges and the strategies for overcoming the challenges. A sample of 1200 participants was drawn (300 teachers, 600 students and 300 examination personnel) from two (2) geo-political zones by means of multistage sampling procedure. Three instruments were used for data collection namely the Teachers' Perception on Information and Communication Technology in Educational Assessment System (TPICTEAS), Students' Perception on Information and Communication Technology in Educational Assessment System (SPICTEAS), Examination Personnel' Perception on Information and Communication Technology in Educational Assessment System (EPPICTEAS). Data were collected and analysed using descriptive statistics. It was found that poor computer literacy level among teachers and students, dearth of ICT skilled personnel, inadequate ICT infrastructures and lack of fund among others are the major challenges of ICT in Nigeria educational assessment system. The study recommends the following: need for computer literacy education, need for ICT skilled personnel, provision for adequate ICT infrastructures, adequate funding among others.

Key Words: Information and Communication Technology (ICT), assessment, educational assessment, perception, challenges

INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) IN NIGERIA EDUCATIONAL ASSESSMENT SYSTEM: EMERGING CHALLENGES.

Introduction

The influence of ICT worldwide has certainly affected the field of education positively. In like manner and as a developing nation, Nigeria educational system is witnessing an optimistic transformation in this age of knowledge explosion. In the findings of Adetuyi and Oluwatayo (2012), one interesting thing about ICT in the Nigeria educational system is that it serves as a transformational tool that has promoted the shift to a learner–centred environment. In the same vein, it has helped to increase access to and improve the relevance and the quality of education with a view to facilitating the acquisition and absorption of knowledge, improving policy formulation and execution and widening the range of opportunity for business and the poor. Further still, with the internet and world wide web, a wealth of learning materials in almost every subject and in a variety of media can now be accessed from anywhere at any time of the day by an unlimited number of people.

To Adegbija, Fakomogbon and Daramola (2012), e-examination is a welcome innovation in the Nigeria educational system due to several pitfalls in the conventional examination in the form of examination malpractices, delay and/or non-release of examination results especially where there are large classes or public examinations for candidates. As a way of curbing examination irregularities, Adegbija et al (2012) highlighted some institutions that have adopted e-examination for assessing their candidates through intranet medium. Among such are Joint Admissions Matriculation Board (JAMB), West African Examinations Council (WAEC), National Business and Technical Examinations Board (NABTEB), National Examinations Council (NECO), National Teachers' Institute (NTI) and Teachers' Registration Council of Nigeria (TRCN). For screening of candidates, most tertiary institutions in Nigeria now use e-examinations in the Post Unified Tertiary and Matriculation Examination (Post-UTME).

Further in their findings, Adegbija et al (2012) identified the following universities in Nigeria that are almost fully or partially implementing the e-examination for assessing their students. These include: National Open University of Nigeria (NOUN), University of Ilorin, Ilorin, Federal University of Technology, Minna, Covenant University, Ota (Private), University of Nigeria, Nsukka, University of Lagos, Lagos. For clarification sake, only NOUN (an Open University) is fully implementing e-examinations for assessing their students through the internet.

To attest to this assertion, Taiwo and Adewuni (2013) confirm that most tertiary institutions in Nigeria now adopt e-application, e-admission and e-registration; it has equally become a field of study in Colleges of Education, Polytechnics, Monotechnics and Universities. Both science and technology of the course have become areas of specialization to many students at undergraduate, graduate and post-graduate levels.

With all these laudable benefits of ICT to the field of education, the issue of assessment requires further inquiry as a result of challenges facing the Nigeria educational assessment system. To Ojerinde (2012), assessment is at the heart of education due to the fact that test scores of assessment are used to gauge students' academic strengths and weaknesses; communities rely on these scores to judge the quality of their educational system; state and federal lawmakers use these same measure to determine whether public schools meet the goals and aspirations of those who set them hence, testing forms the bedrock of educational assessment Aworanti (2013) confirms that, one of the most important challenges of managing educational assessment in Nigeria is the production of valid test scores and grades through institutional and public examinations established for certification purposes.

As a matter of concern, Nenty (1996) asserts that a good test theory which is capable of addressing some, if not all the testing problems (such as item bias, test score equating, latent ability, scale and test construction) should be used by the examining bodies in order to ensure quality assurance in educational assessment and certification. Without mincing words, various types of tests in the areas of educational and psychological measurements have recently become subjects of the application of Item Response Theory (IRT) which invariably serves as a product of ICT development. In view of the foregoing, this research work is being conducted to investigate the extent to which ICT has been applied to Nigeria educational assessment system, determine the emerging challenges and remedies involved in addressing such challenges.

Research Questions

1. To what extent has ICT been applied to the Nigeria educational assessment system?

2. What are the emerging challenges in the application of ICT to the Nigeria educational assessment system?

3. What are the perceived remedies for overcoming the emerging challenges in ICT?

Methodology

A survey research was adopted for this study. Students and teachers in technical colleges as well as examination personnel in National Business and Technical Examinations Board (NABTEB) in Nigeria form the population for the study. In terms of sampling procedure, multistage sampling technique was used. Two geo-political zones were randomly selected out of the six geo-political zones in Nigeria. In each of the two geo-political zones randomly selected, three States were randomly selected. From each of the randomly selected six States altogether, four technical colleges were randomly selected in each State from which twenty-five (25) students each were randomly selected. In terms of selection of teachers, fifty (50) teachers from the four technical colleges in each State were randomly selected. As regards the examination personnel for the study one hundred and eighty (180) examination personnel were randomly selected from six (6) departments at the NABTEB Headquarters while twenty (20) examination personnel were randomly selected in each of the six (6) States. By implication, a sample of six hundred (600) technical students, three hundred (300) technical teachers and three hundred (300) examination personnel was chosen for the study.

Instruments

Three instruments were used for data collection and they are designed by Research and Quality Assurance Department of National Business and Technical Examinations Board (NABTEB) with a view to eliciting important information related to "Information and Communication Technology (ICT) in Nigeria educational assessment system with its emerging challenges" Each of the instruments has sections A and B. The instruments were:

(a). Students' Perception on Information and Communication Technology in Educational Assessment System (SPICTEAS).

(b). Teachers' Perception on Information and Communication Technology in Educational Assessment System (TPICTEAS).

(c). Examination Personnel Perception on Information and Communication Technology in Educational Assessment System (EPPICTEAS).

Section A of the three instruments contains background information of the participants. For the students, their background information include name of the school, sex and the class of technical study. For the teachers, this includes name of the school, sex, highest qualification

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and year of experience while those of the examination officers is made up of location of the State officer, sex, year of service as a NABTEB staff and highest academic qualification. Section B of each of the instruments consists of 27 items. Each item contains four (4) options in the form of Likert-scale: **Strongly Agree (SA), Agree (A), Disagree (D), Strongly Disagree (SD).** The validation of the instruments was done with 10 technical schools in another Geo-political zone apart from the ones for this study. Factor analysis was used to establish the construct validity of the instruments with Cronbach Alpha method. The reliability coefficients of the instruments were 0.86, 0.83 and 0.85 respectively. Any item with mean value of 2.5 and above represents positive response for selection for this study and a mean below 2.5 is neglected.

Data Analysis Method

Descriptive statistics were used in analysing the data collected through the instruments for this study.

Results and Discussion

Research Question one

To what extent has ICT been applied to the Nigeria educational assessment system?

Table 1: Statistics showing the application of ICT to the Nigeria educational assessment system

S/N	STATEMENT	STUDENT'S RESPONSE			TEACHER'S RESPONSE			EXAMINATION PERSONNEL RESPONSE		
		MEAN	AGREE	DIS-AGREE	MEAN	AGREE	DIS-AGREE	MRAN	AGREE	DIS-AGREE
1	Through ICT, on-line registrations are done by students in secondary and tertiary institutions for better assessment	**3.44**	562 93.6%	38 6.4%	**3.56**	288 96%	12 4%	**3.48**	288 96%	12 4%
2.	Biometric application is employed by computer based	**3.24**	517	83	**3.19**	259	41	**3.20**	248	52

No.	Statement									
	institutions to reduce assessment manipulations		86%	14%		86.3%	13.7%		82.6%	17.4%
3.	Closed Circuit Television (CCTV) is adopted by computer based institutions to curb examination malpractices	3.52	560 93.3%	40 6.7%	3.53	283 94.3%	17 5.7%	3.54	289 96.3%	11 3.7%
4.	Item Response Theory (IRT) soft-wares are employed by computer based institutions to give room for better objectivity in measurement of educational outcomes	3.37	523 87.2%	77 12.8%	3.43	275 91.7%	25 8.3%	3.51	284 94.7%	16 5.3%
5.	Computer Based institutions make use of IRT parameter estimates for easy item selection in test development	3.09	478 77.7%	122 22.3%	3.28	271 90.3%	29 9.7%	3.18	261 87.4%	39 12.6%
6.	Item biases are now identified to remove bad items in examinations	3.49	559 93.2%	41 6.8%	3.53	293 97.7%	7 2.3%	3.38	284 94.7%	16 5.3%
7.	Electronic test item banking is in operation through ICT innovations	3.32	531 88.5%	69 11.5%	3.30	281 93.7%	19 6.3%	3.36	286 95.3%	14 4.7%

8.	Electronic examination for higher leaning is in operation through open and distance learning	**3.22**	523 87%	77 13%	**3.30**	274 91.4%	26 9.6%	**3.31**	268 89%	32 11%
9.	On-line results' checking is made available through ICT	3.56	480 80%	120 20%	**3.42**	215 71.6%	85 28.4%	**3.45**	265 88.3	35 11.7%

Table 1 indicates the perception analysis of students, teachers and examination personnel on the extent of applying ICT to the Nigeria educational assessment system. Over 70% of all the participants agreed on the following: Through ICT, on-line registrations are done by students in secondary and tertiary institutions for better assessment; biometric application is employed by computer based institutions to reduce assessment manipulations; Closed Circuit Television (CCTV) is adopted by computer based institutions to curb examination malpractices; Item Response Theory (IRT) soft-wares are employed by computer based institutions to give room for better objectivity in measurement of educational outcomes; Computer Based institutions make use of IRT parameter estimates for easy item selection in test development; Item biases are now identified to remove bad items in examinations Electronic test item banking is in operation through ICT innovations; Electronic examination for higher learning is in operation through open and distance learning (NOUN) and On-line results' checking is made available through ICT

The above results confirmed the findings of Tinio (2002) that ICTs are powerful enabling tools for educational change and reform. When used appropriately, different ICTs help expand access to education, strengthen the relevance of education to the workplace, and raise educational quality by creating an active process connected to real life. David (2005) asserts that the introduction of ICT into universities clearly changes the way education is conducted. Not only is it possible to work with distance learning and achieve a chosen collaboration between universities, ICT is also paving the way for a new pedagogical approach where students are expected to play more active role than before. To Kwacha (2007), ICT has made

an impact on the quality and quantity of teaching, learning and research in the tradition and/or distance education institutions using it.

According to Ololube, Ubogu and Ossai (2007), the introduction of ICT usage, integration and diffusion has initiated a new age in educational methodologies, thus it has radically changed traditional method of information delivery and usage patterns in the domain as well as offering contemporary learning experience for both instructors and students.

Research Question Two

What are the emerging challenges in the application of ICT to the Nigeria educational assessment system?

Table 2: Statistics showing the emerging challenges in the application of ICT to the Nigeria educational assessment system

S/N	STATEMENT	STUDENT'S RESPONSE			TEACHER'S RESPONSE			EXAMINATION PERSONNEL RESPONSE		
		MEAN	AGREE	DIS-AGREE	MEAN	AGREE	DIS-AGREE	MRAN	AGREE	DIS-AGREE
1.	Lack of ICT literacy among teachers affects its utmost use in schools	3.23	493 82.2%	107 17.8%	3.42	278 92.7%	22 7.3%	3.42	287 95.6%	13 4.4%
2.	Inadequate ICT training facilities	3.16	489 81.5%	111 18.5%	3.23	259 86.3%	41 13.7%	3.35	279 93%	21 7.%
3.	Inappropriate funding hinders the maximum use of ICT facilities for assessment in schools	3.29	511 85.2%	89 14.8%	3.37	273 91%	27 9%	3.46	284 94.7%	16 5.3%
4.	There are few highly skilled personnel to operate complex ICT facilities for assessment processes	3.20	486 81%	114 19%	3.36	268 89.3%	32 10.7%	3.25	267 89.7%	33 11%
5.	Unwilling to change from the old system of testing to more innovative and	3.30	519	81	3.34	266	34	3.14	248	52

No.	Item	Mean	Freq	Freq	Mean	Freq	Freq	Mean	Freq	Freq
	technology based assessment methods		86.5%	13.5%		88.7%	11.3%		82.7%	17.3%
6.	High cost of ICT facilities:	**3.27**	506 84.3%	94 15.7%	**3.40**	277 92.3%	23 7.7%	**3.42**	278 93.7%	22 6.3%
7.	Access to internet connectivity is limited in remote areas	**3.24**	505 84.2%	95 15.8%	**3.20**	245 81.7%	55 18.3%	**3.23**	249 83%	51 17%
8.	Limited knowledge-ability of Item Response Theory soft-wares for assessment purposes	**3.25**	502 83.7%	98 16.3%	**3.21**	254 84.7%	46 15.3%	**3.14**	239 89.7%	61 20.3%
9.	Unstable electricity supply affects the use of ICT	**3.71**	526 87.6%	74 12.4%	**3.52**	280 93.4%	20 6.6%	**3.59**	288 96%	12 4%

From table 2 above, over 80% of the students, teachers and examination personnel for this study attest to the following emerging challenges in the application of ICT to the Nigerian educational assessment system: Lack of ICT literacy among teachers affects its utmost use in schools; inadequate ICT training facilities; inappropriate funding hinders the maximum use of ICT facilities for assessment in schools; there are few highly skilled personnel to operate complex ICT facilities for assessment processes; unwilling to change from the old system of testing to more innovative and technology based assessment methods; high cost of ICT facilities:; access to internet connectivity is limited in remote areas; Limited knowledge-ability of Item Response Theory soft-wares for assessment purposes and unstable electricity supply affects the use of ICT.

The above result was confirmed by Ekpenyong, Ogbeide and Robinson (2012) with the fact that there is a shortage of trained personnel in application of software, operating systems, network administration and technicians to service and repair computer facilities. To corroborate this, Joshua, Odesanya and Baba (2012) recognise the following challenges towards the use of ICT: inadequate infrastructure such as computer hardware and software, lack of skilled manpower to manage available systems and inadequate training facilities, poor electricity distribution, resistance to change from traditional methods of assessment to more

technology based methods of assessment. As a developing country also, electricity failure has been a persistent problem militating against ICT application and use in Nigeria (Adomi, 2005a; Adomi, Omodeko and Otolo, 2004; Adomi, et.al, 2003). This prevents the few schools with ICT facilities to use them regularly. Unstable electricity makes information, communication and technology impossible - that is, Data cannot be processed, analysed, interpreted and made meaningful to receiver of a message. Information cannot be transferred from one source/person to another and civilized life of higher standard of living cannot be achieved.

Research Question Three

What are the perceived remedies for overcoming the emerging challenges in ICT?

Table 3: Statistics showing the perceived remedies for overcoming the emerging challenges in ICT

S/N	STATEMENT	STUDENT'S RESPONSE			TEACHER'S RESPONSE			EXAMINATION PERSONNEL RESPONSE		
		MEAN	AGREE	DIS-AGREE	MEAN	AGREE	DIS-AGREE	MEAN	AGREE	DIS-AGREE
1.	Need for computer literacy education	**3.54**	556 92.6%	44 7.4%	**3.63**	292 97.3%	8 2.7%	**3.55**	283 94.3%	17 5.7%
2.	Need for techni-cally trained IRT personnel in areas of test development	**3.54**	558 93%	42 7%	**3.55**	289 96.7%	11 3.7%	**3.57**	284 94.6%	16 5.4%
3.	Adequate funding should be provided by the government	**3.52**	555 92.5%	45 7.5%	**3.53**	284 94.7%	16 5.3%	**3.41**	267 89%	33 11%
4	Provision of adequate ICT infrastructures	**3.04**	487 79.5%	113 20.5%	**3.17**	251 83.7%	49 16.3%	**3.18**	256 85.4%	44 14.6%
5.	Periodic IRT training workshops and seminars on	**3.36**	532 88.6%	68 11.4%	**3.46**	279 93%	21 7%	**3.40**	269 89.6	31 10.4%

No.	Item										
	item development process skills										
6.	Philanthropist sponsor-ship should be encouraged to provide computer laboratories in schools	**3.27**	520 87%	80 13%	**3.36**	273 91%	27 9%	**3.40**	277 92.3%	23 7.7%
7.	Public-Private-Partner-ship should be encouraged to equip computer laboratories in schools.	**3.33**	544 92.3%	56 7.7%	**3.32**	270 90%	30 10%	**3.36**	283 94.3%	17 5,7%
8.	Old students association should be encouraged to provide ICT facilities for their alma-mater	**2.59**	372 62%	228 38%	**2.72**	186 72%	114 38%	**2.67**	184 61.3%	11.6 38.7%
9.	ICT should be introduced into the basic educational systems in Nigeria	**2.91**	411 68.5%	199 31.5%	**3.05**	233 77.7%	67 22.3%	**2.97**	221 73.6%	79 26.4%

Table 3 depicts the perceived remedies for overcoming the emerging challenges in ICT from the perception of students, teachers and examination personnel as follows. Need for computer literacy education (92.6%, 97.3% and 94.3%); Need for technically trained IRT personnel in areas of test development (93%, 96.7% and 94.6%); Adequate funding should be provided by the government (92.5%, 94.7% and 89%); Provision of adequate ICT infrastructures (79.5%, 83.7% and 85.4%) Periodic IRT training workshops and seminars on item development

process skills (88.6%, 93% and 89.6%); Philanthropist sponsor-ship should be encouraged to provide computer laboratories in schools (87%, 91% and 92.3%); Public-Private-Partner-ship should be encouraged to equip computer laboratories in schools. (79%, 83.7% and 85.4%); Old students association should be encouraged to provide ICT facilities for their alma-mater (62%, 72% and 61%); ICT should be introduced into the basic educational systems in Nigeria (68.5%, 77.7% and 73.6%)

Based on these perceived remedies among others, it can be said that if all the various aspects of the remedies are well encouraged, the prospect of ICT in the Nigeria educational assessment system will allow for quality operations of assessment of students, teachers and the educational programmes for better productivity and creativity in this age of knowledge explosion.

Conclusion

The present era of technological explosion has immensely popularized the use of Information and Communication Technology to enhance teaching and learning activities as well as assessment and certification processes. There is no doubt therefore that giving attention to those remedies as discussed in this paper would not only address the challenges confronting the use of ICT but also prevent the re-occurrence of such impediments to efficient and effective use of it. Hence, the identified challenges are not strong enough to discourage the assessment bodies from embracing the efficacy of Information and Communication Technology for enhancement of their operations.

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