International Journal of Innovative Social & Science Education Research 5(3):51-60, July-Sept., 2017

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Readiness and Acceptability of Computer-Based Test (CBT) for Post-University Matriculation Examinations (PUME) among Urban and Rural Senior Secondary School Students in Rivers State

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ABSTRACT
The purpose of this study was to determine the readiness and acceptability levels of final year urban and rural secondary school students in Rivers State in application of this innovative form of examination (Post-UME) in further assessment. The research design adopted in this study was descriptive survey research design. The sample size for the study comprised 600 final year students drawn from 60 secondary schools in 12 LGAs from the 3 senatorial zones of Rivers State, Nigeria, using purposive sampling to take care of location variables. A structured questionnaire (with reliability of .88) was used to collect data and a total number of 450 copies of the questionnaire were retrieved, which were analyzed using the mean with standard deviation and independent t-test. The results indicate that the level of readiness and acceptability is moderate on the part of students from urban areas of the state but their counterparts in the rural areas are lagging behind. It is concluded that Rivers State students both at the urban and rural area if given the enabling environment and support will build high level of readiness and acceptability of the innovation in learning assessment, whether JAMB UTME/Post-UME.
Keywords: secondary school students, Computer-Based Test, JAMB UTME, ICT

INTRODUCTION

Teaching and learning are continuously being enhanced. The internet has therefore become an essential tool in the administration of pedagogy. Information and communication technology (ICT) is one of the basic building blocks of modern society and the use of computers in the teaching-learning process cannot be overemphasized. The understanding and mastering of the basic skills and concepts of the computer is very crucial in education. This is because it adds value to the processes of teaching-learning and to the organization and administration of learning institutions. ICT encompasses different types of technologies, which are used for capturing, processing and transmitting information, with the aid of a computer. Kumar (2006) asserted that it is an umbrella term that includes communication device or application, radio, television, cellular phones, computers, network, hardware and software, satellite systems and so on, as well as the various services and applications associated with them. Thus, ICT is useful in the various areas of education such as teaching and learning, resource management, admission and examination processes also known as learning assessment. According to Omiebi-Davids (1996), the computer can be programmed to perform whatever task that is required. The use of smart phones cannot be overlooked as this application has gone a long way to substitute computers. One specific form of ICT for learning

assessment is the Computer-Based Testing (CBT), also known as Computer-Based Assessment, e-assessment, e-examination or e-testing. It is a method of administering tests electronically by use of computers. It is becoming commonplace to see institutions across the educational strata adopt computer-based tests (CBT) and assessment to admit or screen students for entrance into Nigerian institutions (Sadiq and Onianwa, 2011). In Nigeria, employers now conduct aptitude tests for job seekers through electronic means; the universities and other tertiary institutions are registering and conducting electronic examinations for their students through the internet and other electronic and networking gadgets. Similarly, different examination bodies in the country such as West Africa Examinations Council (WAEC), National Examinations Council (NECO), National Business and Technical Examinations Board (NABTEB), and National Teachers' Institute (NTI), among others register their students through electronic means (Olawale & Shafii, 2010).

The administration of examinations in Rivers State secondary schools and Nigeria at large is commonly done in the traditional paper and pencil test (PPT) form. The introduction of innovation in pedagogy has given rise to computer-based test (CBT). The CBT as introduced by JAMB in 2013 is now the only form of assessment to gain admissions into the universities. Also, the university authorities had followed suit in the conduct of their Post-UTME exams, all in a bid to promote credibility and minimize examination fraud. There are widespread reactions to this critical innovation/decision following the challenges associated with this form of assessment in Nigeria.

In Nigeria, the mandate to conduct entrance examinations into tertiary educational institutions (Universities, Polytechnics, Colleges of Education & related/similar institutions) is vested in a statutory body known as the Joint Admissions and Matriculation Board (JAMB). Hence, every year, JAMB conducts Unified Tertiary Matriculations Examinations (UTME), which originally was known as University Matriculation Examinations (UME) and forwards the results to the candidates' institutions of choice for selection and admission. In essence, JAMB was solely responsible to conduct placement tests in Nigeria in order to regulate the admission policy with regards to students' in-take in the country specifically at the tertiary level of education. Later, it was observed that some universities in Nigeria took a bold step to conduct Post UME/Post JAMB examinations for the purpose of screening and admitting students into programmes of study in their universities.

Research outcomes have supported the fact that when students are motivated and testing conditions are equivalent, there are no differences between the scores obtained via CBT or PPT (Alabi, Issa & Oyekunle, 2012). Prior to the adoption of CBT examinations by JAMB, students were assessed using paper and pen which is known as paper based test or pen and paper test (PPT). Osuji (2012) viewed that over the years, the UTME by JAMB has been in a paper and pencil test (PPT) form, and has been characterized by a lot of fraudulent practices ranging from leakage of examination papers, use of machineries of all sorts by candidates, bribe taking by examination officials, impersonation, use of unauthorized gadgets, and so on. This led to criticism of the quality of results. Amatareotubo (2006) describes how the federal government of Nigeria introduced the policy of Post-JAMB screening by universities in 2005, through the then Minister of Education, Mrs. Chinwe Obaji. This policy made it mandatory for all tertiary institutions to screen candidates after their JAMB results and before giving admission. Candidates with a score of 200 and above would be shortlisted by JAMB and their names and scores sent to their universities of choice for further screening using aptitude tests, oral interviews, or even another examination. The introduction of Post UME was not without its own challenge as it was also conducted via PPT. Karadeniz (2009) studied the impact of paper based, web based and mobile based assessment on students' achievement. The study revealed that students had positive attitude towards web based and mobile based assessment due to ease of use, and comprehensive and instant feedback. Moreover, most favoured tests were web based and the least favoured were paper based. In a bid to eliminate or minimize examination fraud and in response to further research in learning assessment JAMB in 2013 introduced the computer based testing (CBT) form of UTME with massive publicity and sensitization and universities across the country adopted same for Post UME. The introduction of CBT by JAMB elicited wide spread reactions from stakeholders especial prospective candidates, just as the introduction of Post Ume was also strongly criticized. The essence of all this is to make sure the best

candidates are prepared to face the rigorous challenges associated with university education and some individuals view it as a means for Nigeria to meet up the current trend of technological advancement. The application of CBT in learning assessment has gone a long way to tackle examination fraud.

The former Vice Chancellor of Rivers State University of Science and Technology, Professor Barineme Beke Fakae in an International Technology Exhibition in Dubai, the United Arab Emirate, stated that ICT breaks wings of corruption. He asserts that prospective students are admitted on merit bases and that the institutions data base is matched with that of JAMB (Vanguard, 2014). This means fraudulent activities as impersonating can be easily dictated as exchange of information between the institution and JAMB is via biometrics and physical data.

The Joint Admissions and Matriculation Board (JAMB) concluded its first solely Computer-Based Test (CBT) after its introduction in 2013. The examination, which commenced March, 9th 2015 in 400 centres across Nigeria and seven other countries, has elicited sundry reactions from candidates and other stakeholders. While some candidates applauded the conduct of the computer-based test and the swiftness in releasing the results, others have highlighted its many lapses. Notable among the CBT's shortcomings are the server and power failures experienced in some centres, as well as non-availability of other sources of power supply. There were also cases of outright change of examination dates without notification to the affected candidates. However, observable merits of the new testing technique include the elimination of impersonation, special centres and cheating. The method also ensured the release of results few hours after the examination (Sun, 2015). Particularly, in Rivers state the above mentioned lapses were recorded as it was reported that candidates went on rampage after several failed attempt to obtain their accreditation papers (Tide, 2015). Another challenging factor was the large number of candidates to limited approved centres for the test as asserted by the Zonal Coordinator, JAMB, Rivers State, Mrs Beatrice Etta-Nyiam. She stated that the approved CBT centres include Rivers State University of Science and Technology (RSUST), University of Port Harcourt (UNIPORT), Rivers State Polytechnic (Rivpoly), Federal College of Education, Technical, Omoku, Ignatius Ajuru University of Education (IAUOC), Rivers State College of Arts and Science and two others (Tide, 2015). Rivers state with a large number of candidates across the 23 LGAs had only 8 approved centres.

The upshots of JAMB CBT and candidates' experiences across the country are similar in nature but that is not to say that certain states did not record peculiar accounts like the physical confrontation exhibited by candidates in Rivers State. It was against these backdrops that this study was carried out to determine readiness and acceptability levels of Rivers State secondary school students in application of this innovative form of examination in further assessment (Post-UME).

Purpose of the Study

The purpose of this study was to determine the readiness and acceptability levels of final year Rivers state secondary school students in application of this innovative form of examination in further assessment (Post-UME). Specifically the study focused on:

1. Determine the extent to which access to ICT facilities by Rivers state secondary school students affects their readiness and acceptability of CBT.
2. Examine the extent of use of ICT facilities in learning by Rivers state secondary school students and how it affects their readiness and acceptability of CBT.
3. Verify the extent to which possession of requisite computer operation skills affects the readiness and acceptability of CBT by Rivers state secondary school students.
4. Find out the extent to which school location affects the readiness and acceptability of CBT by Rivers State secondary school students.

Research questions

The research questions of this study were as follows:

1. How does access to ICT facilities by Rivers State secondary school students' influence their readiness and acceptability of CBT?
2. To what extent does the use of ICT facilities in learning by Rivers State secondary school students influence their readiness and acceptability of CBT?

3. How does the possession of requisite computer operation skills determine the readiness and acceptability of CBT by Rivers state secondary school students?
4. To what extent does school location influence the readiness and acceptability of CBT by Rivers State secondary school students?

Hypotheses

The following null hypotheses were tested:

1. There is no significant difference in the mean rating of Rivers state students from urban and rural secondary schools regarding the extent in which access to ICT facilities influences their readiness and acceptability of CBT.
2. There is no significant difference in the mean rating of Rivers state students from urban and rural secondary schools regarding the extent in which the use of ICT facilities in learning can influence their readiness and acceptability of CBT.
3. There is no significant difference in the mean rating of Rivers state students from urban and rural secondary schools regarding the extent in which possession of requisite computer operation skills can influence their readiness and acceptability of CBT.
4. There is no significant difference in the mean rating of Rivers state students from urban and rural secondary schools regarding the extent in which location can influence their readiness and acceptability of CBT.

METHOD

The research design used in conducting this study was descriptive survey research design. The target population for the study was SSS3 students in all Rivers State secondary schools. However, for reasons of feasibility, a sample of 5 schools each was selected from secondary schools in 12 local governments areas (52%) from each of the three senatorial zones of Rivers State namely; Port Harcourt, Obio/Akpor, Etche, Omuma (Rivers East), Andoni, Gokana, Oyigbo, Opobo (Rivers South-East) and Bonny, Ahoada, Abua/Odual, Ogba/Egbema/Ndoni (Rivers West) which was further grouped into urban (Port Harcourt, Obio/Akpor, Ahoada, Bonny, Gokana, Opobo) and rural (Omuma, Etche, Andoni, Abua/Odual, Oyigbo, Ndoni) areas. A purposive sampling technique was used to select equal number of 10 students each from 60 schools in 12 LGAs giving a total of 600 students as respondents. The instrument for data collection titled "RACQ" (Readiness and Acceptability of CBT Questionnaire) was made up of Sections A and B while Section A deals with personal data of respondents, Section B deals with a 30-item questions which tends to elicit responses on the extent of readiness and acceptability of the CBT form of examination as relating to the 4 research questions on a 5-point scale of "Very High Extent" (VHE) - 5, "High Extent" (HE) - 4, "Moderate Extent" (ME) - 3, "Low Extent" (LE) - 2 and "Very Low Extent" (VLE) - 1. The instrument was face validated by two experts in the Department of Business Education and one from Measurement and Evaluation all of Faculty of Technical and Science Education in Rivers State University of Science and Technology. The reliability of the instrument was determined using the Cronbach Alpha method. A reliability coefficient of .88 was obtained, an indication that the instrument was reliable for data collection. The 600 copies of questionnaire that were administered had 75% return rate and was used for computation. The administration of the instrument was personally carried out by the researchers and research assistants. The data collected were analyzed using mean with standard deviation while the null hypotheses were tested using independent group t-test statistics at .05 level of significance. Since the items were structured on a five-point rating scale, the decision rule was based on the mid-point of the scale, 3.00. Therefore, items with mean scores of 3.00 and above were regarded as high extent while items below 3.00 were regarded as low extent.

RESULTS

It is necessary to state that not all the questionnaire copies were retrieved from the respondents, and as such, the researcher worked with 450 questionnaire copies that were retrieved out of 600 copies of the questionnaire distributed to the respondents. The results obtained from the study are shown on the tables below:

Research Question 1

How does access to ICT facilities by Rivers state secondary school students' influence their readiness and acceptability of CBT?

Table 1: Mean rating of the respondents on access to ICT facilities.

S/n	Item	Urban students (N=235)			Rural students (N=215)		
		Mean	**SD**	**Dec.**	**Mean**	**SD**	**Dec.**
1.	Computers are easily accessible.	3.92	1.30	HE	2.84	1.55	LE
2.	I have seen an internet modem/internet enabled computer.	4.17	1.03	HE	2.78	1.54	ME
3.	There is a well-equipped ICT lab in my school.	4.23	1.25	HE	2.46	1.46	LE
4,	I have a personal computer.	3.51	1.60	HE	2.34	1.56	LE
5.	My personal computer is connected to the internet.	3.34	1.66	ME	2.21	1.50	LE
6.	I have a smart phone.	4.06	1.54	HE	3.29	1.55	ME
	Total mean/SD	**23.23**	**8.38**		**15.92**	**9.16**	
	Grand mean/SD	**3.87**	**1.40**		**2.65**	**1.53**	

Table 1 shows that students from urban areas rated the 6 items in the first cluster high to having accessible ICT facilities while there counterpart in the rural areas have poor access to ICT facilities. The grand mean of 3.87 is a clear indication that ICT facilities are easily available to students in the urban areas and the grand mean of 2.65 shows that secondary school students in the rural areas are lacking behind and in most cases ICT facilities are alien to them.

Research Question 2

To what extent does the use of ICT facilities in learning by Rivers state secondary school students influence their readiness and acceptability of CBT?

Table 2: Mean rating of the respondents on use of ICT facilities.

S/n	Item	Urban students (N=235)			Rural students (N=215)		
		Mean	**SD**	**Dec.**	**Mean**	**SD**	**Dec.**
7.	Computers are used for teaching in my school.	4.20	1.26	HE	2.39	1.42	LE
8.	Computers are used for examination in my school	2.27	1.45	LE	2.07	1.45	LE
9.	I use internet to source info. For assignment.	3.27	1.72	ME	2.19	1.50	LE
10.	I use computer to send/receive mails.	3.44	1.64	ME	2.35	1.53	LE
11.	I type and produce doc. Via computer.	3.27	1.77	ME	2.2	1.48	LE
12.	I use my phone to prepare documents.	3.66	1.70	HE	1.52	1.05	LE
13.	I use my phone to send/receive mail.	3.83	1.49	HE	2.32	1.55	LE
14.	I use comp/smart phone in watching movies.	4.27	1.08	HE	3.75	1.44	HE
	Total mean/SD	**28.21**	**12.11**		**18.79**	**11.42**	
	Grand mean/SD	**3.53**	**1.51**		**2.35**	**1.43**	

Table 2 also shows that students from urban areas rated all items high, except for item 2 which was rated low by both group of students indicating that the use of computers for examination is poor. Also, the high rating of 3.75 in item 14 shows that students in rural area own smart phones but uses more of it for entertainment rather than edutainment. The grand mean of 3.53 indicates that ICT facilities are used by urban secondary school students in Rivers state while students in the rural areas of the state are underprivileged. This implies that rural students will find it difficult sitting for CBT since it has to do with the use of a computer.

Research Question 3

How does the possession of requisite computer operation skills determine the readiness and acceptability of CBT by Rivers state secondary school students?

Table 3: Mean rating of the respondents on possession of requisite computer operation skills.

S/n	Item	Urban students (N=235)			Rural students (N=215)		
		Mean	**SD**	**Dec.**	**Mean**	**SD**	**Dec.**
15.	I can read info on the computer screen.	4.14	1.31	HE	3.69	1.55	HE
16.	I can boot and shut down a computer.	3.36	1.68	ME	2.34	1.53	LE
17.	I can use a mouse.	3.29	1.73	ME	2.27	1.53	LE
18.	I have knowledge of the d/f keys of a keyboard.	3.34	1.70	ME	2.21	1.51	LE
19.	I have knowledge of basic terms used with computers.	3.34	1.53	ME	2.21	1.58	LE
20.	I can save/retrieve info in a computer.	3.46	1.62	ME	2.26	1.53	LE
21.	I have knowledge of internet application.	3.92	1.30	HE	2.2	1.48	LE
22.	I can log into the internet.	3.93	1.30	HE	2.17	1.47	LE
23.	I can operate a smart phone.	4.39	1.06	HE	3.82	1.40	HE
	Total mean/SD	**33.71**	**13.23**		**23.17**	**13.58**	
	Grand mean/SD	**3.75**	**1.47**		**2.57**	**1.51**	

Table 3 shows high mean ratings on possession of basic computer operation skills by students of urban areas in Rivers state. However, item 15 and 23 were also rated high; 3.69 and 3.82 by students of rural area, indicating that they have the basic skills of reading and operation of smart phones. The grand mean of 3.53 indicates that urban secondary school students in Rivers state have the basic requirements needed for use of computers and as such the use of computer for assessment cannot be strange while the grand mean of 2.57 of their counterparts in rural secondary school shows how moderate they have what it takes to handle ICT facilities. This implies that rural students will not find it extremely difficult sitting for CBT since they know how to read and can operate a smart phone.

Research Question 4

To what extent does school location influence the readiness and acceptability of CBT by Rivers State secondary school students?

Table 4: Mean rating of the respondents as regards their location.

S/n	Item	Urban students (N=235)			Rural students (N=215)		
		Mean	**SD**	**Decision**	**Mean**	**SD**	**Decision**
24.	We have regular power supply in my area.	3.97	1.30	HE	1.87	1.36	LE
25.	There are charge-free network connections in my area.	3.17	1.78	ME	1.62	1.08	LE
26.	Enlightenment about CBT exam in my area is adequate.	4.23	1.25	HE	2.31	1.40	LE
27.	There is a communication mast sited in my area.	4.14	1.34	HE	3.33	1.75	ME
28.	PPT is the only means for assessment in my area.	3.51	1.60	HE	4.45	1.02	LE
29.	ICT centres are easily located within my area.	4.6	0.76	VHE	2.19	1.50	LE
30.	There are good/accessible roads to my area.	3.91	1.44	HE	I.63	1.18	LE
	Total mean/SD	**26.81**	**9.47**		**17.4**	**9.29**	
	Grand mean/SD	**3.83**	**1.35**		**2.49**	**1.33**	

Table 4 shows high mean rating for the location of students in urban areas of Rivers state with a grand mean of 3.83; indicating that they have ICT friendly environment. Students of rural areas with a mean of 2.49 show difficulties surrounding smooth access/application to ICT facilities. However the both group had high mean ratings of 3.52 and 4.45 respectively in item number 28 indicating that Paper and Pencil Test (PPT) is the common form of assessment and the introduction of CBT is an innovation that is gradually been adopted and would require continuous application in a more conducive atmosphere to gain acceptability.

Hypothesis 1

There is no significant difference in the mean rating of Rivers state students from urban and rural secondary schools regarding the extent in which access to ICT facilities influences their readiness and acceptability of CBT.

Table 5: t-test result of the difference in mean rating of the respondents on access to ICT facilities

Group	N	Mean	SD	*Df*	Level of Significance	t-cal	t-tab	Remarks
Urban students	235	3.87	1.40					
Rural students	215	2.65	1.53	448	.05	8.80	1.96	Rejected

Table 5 shows that at 5% level of significance with 448 degree of freedom, the calculated t-value of 8.80 is greater than the table value of 1.96. Hence, the null hypothesis is not accepted, meaning that there is a significant difference between urban and rural students rating on access to ICT facilities.

Hypothesis 2

There is no significant difference in the mean rating of Rivers state students from urban and rural secondary schools regarding the extent in which the use of ICT facilities in learning can influence their readiness and acceptability of CBT.

Table 6: T-test result of the difference in mean rating of the respondents on the use of ICT facilities.

Group	N	Mean	SD	*Df*	Level of Significance	t-cal	t-tab	Remark
Urban students	235	3.53	1.51					
Rural students	215	2.35	1.43	448	.05	8.51	1.96	Rejected

The data in Table 6 shows that at 5% level of significance with 448 degree of freedom, the calculated t-value of 8.51 is greater than the table value of 1.96. Hence, the null hypothesis is not accepted, meaning that there is a significant difference between urban and rural students rating on use of ICT facilities.

Hypothesis 3

There is no significant difference in the mean rating of Rivers state students from urban and rural secondary schools regarding the extent in which possession of requisite computer operation skills can influence their readiness and acceptability of CBT.

Table 7: T-test result of the difference in mean rating of the respondents on possession of requisite computer operation skills.

Group	N	Mean	SD	*Df*	Level of Significance	t-cal	t-tab	Remarks
Urban students	235	3.75	1.47					
Rural students	215	2.57	1.51	448	.05	8.39	1.96	Rejected

Table 7 shows that at 5% level of significance with 448 degree of freedom, the calculated t-value of 8.39 is greater than the table value of 1.966. Hence, the null hypothesis is not accepted, meaning that there is a significant difference between urban and rural students rating on possession of requisite computer operation skills.

Hypothesis 4

There is no significant difference in the mean rating of Rivers state students from urban and rural secondary schools regarding the extent in which location can influence their readiness and acceptability of CBT.

Table 8: T-test result of the difference in mean rating of the respondents regarding their location.

Group	N	Mean	SD	*Df*	Level of Significance	t-cal	t-tab	Remark
Urban students	235	3.83	1.35					
Rural students	215	2.49	1.33	448	.05	10.60	1.96	Rejected

Table 8 shows that at 5% level of significance with 448 degree of freedom, the calculated t-value of 10.60 is greater than the table value of 1.96. Hence, the null hypothesis is not accepted, meaning that there is a significant difference between urban and rural students rating regarding their location.

DISCUSSION

One of the findings of this study was that Rivers state secondary school students are commonly assessed with PPT examinations than CBT. However respondents of urban areas are likely not to see CBT as very strange due to high level of accessibility, use of ICT facilities and possession of requisite computer operation skills. Thus, they stand to be ready and would accept to sit for computerized examinations than their rural counterparts. This finding is similar to popular opinions among the public and the press in Nigeria that students lack the necessary skills to face CBT form of UTME by JAMB, and that there are inadequate facilities in our schools, particularly in the rural communities to adequately prepare the candidates for CBT but is contrary to the findings of Joshua, Joshua and Ikiroma (2014) whose findings shows that Nigerian final year secondary school students are generally ready for CBT. This finding also shows that final year students of rural areas in Rivers state are far behind when it comes to use of ICT and this will generally affect their level of readiness and acceptability of any CBT examination; this is

eminent in the mean ratings as shown in the above tables. Aduwa-Ogiegbaen & Iyamu (2005) asserts that Nigeria is lagging behind other African countries such as Senegal, Uganda and South Africa who are already helping secondary school students to become better information users. Worst still, all Internet service providers in Nigeria are based in the urban areas. Also, secondary schools in rural areas lack access to internet facilities due to inadequate electricity supply. This study also shows the high level in possession/usage of smart phones by both groups; while the urban students go an extra mile to use their phones for educative purpose, the rural students uses it more for entertainment.

CONCLUSION

The introduction of CBT into the Nigeria education sector is in no doubt a means to curbing examination fraud and will align Nigeria properly with the rest of the technological world. The findings in this study show that final year urban secondary school students in Rivers state have the enabling environment in terms of access and utilization of ICT facilities. JAMB UTME CBT centres in the state are located in urban areas, also an added advantage to urban students. However, the introduction of smart phones and the ability of both groups to possess/handle it are of great advantage if properly utilized.

RECOMMENDATIONS

Considering the results of the study, it was recommended that:

1. Concerted efforts be put in place to create the much needed awareness/campaign in the rural areas and advocacy be mounted by JAMB and other stakeholders to improve on the use of computers for learning as well as for examinations by both groups; this will go a long way to build up the level of readiness and acceptability of CBT for JAMB UTME and further assessments like Post-UME.
2. JAMB and her accredited agents, educational institutions, business and other interested organizations should strengthen efforts in creating more ICT centres both at the rural areas for the conduct of CBT, such that candidates do not have to travel far distances to take this examinations. Students should also be encouraged and taught how to make judicious use of smart phones for more of educative purpose rather than entertainment as smart phones have been discovered to be a vital tool for edutainment.
3. Government and other non-government organization should assist in procurement of ICT facilities or better still subsidize the purchase of the facilities within the educational sector.

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