

AVAILABILITY AND UTILIZATION OF INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) FACILITIES IN HIGHER INSTITUTIONS IN NIGER STATE, NIGERIA

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ABSTRACT

The study surveyed the availability and utilization of Information and Communication Technology (ICT) in tertiary institutions in Niger State. To elicit responses for the study, four research questions were raised and three hypotheses formulated. One hundred and fifty lecturers, 90 males and 60 females were randomly drawn from three federal tertiary institutions in Niger State to participate in the study. Data was collected for the study through the administration of 35 –item questionnaire to respondents. A test re-test method was used to determine the reliability of the instrument, the result was appropriately scored. The data obtained were analysed using mean to analyse the questionnaire respondents while ANOVA was used to analysed the hypotheses. The findings showed that there was inadequate provision of ICT facilities in federal higher institutions in Niger State and that there is no significant difference between the availability and extent of effective use of ICT facilities and equipment for teaching and research purposes. It was recommended among other things, that there should be adequate provision of ICT facilities and equipment in the tertiary institutions, the existing ICT facilities and equipment should be judiciously used for effective teaching and research purposes. The implications of major findings were discussed and recommendations were made for the availability and utilization of ICTs in higher institutions in Nigeria.

Keywords: *Information and Communication Technology (ICT); Availability and Utilization; ICT facilities and equipment; Tertiary institutions*

Introduction

Information and Communication Technology (ICT) is defined as computer based tools used by people to work with the information and communication processing needs of an organization. It encompasses the

computer hardware and software, the network and several other devices (video, audio, photography camera, etc.) that convert information (text), images, sound, motion, and so on into common digital form (Milken Exchange on Education

Technology, 1999). It is an eclectic application of computing, communication, telecommunication and satellite technology (Yusuf and Onasanya, 2004). Information Technology (IT) which is a component of ICTs refers to the creation, storage and processing of data including hardware system software and software application (Gbenga, 2006).

The need for the development of ICT is a global resolution and has been a subject of great significance to all mankind (Olaofe, 2005). These technologies have become central to contemporary societies. Whether one is talking on phone, sending an email,

going to the bank, using a library, listening to sports coverage on the radio, watching the news on television, working in an office or in the field, going to the doctor, driving a car or catching a plane, one is using ICTs. The prevalence and rapid development of ICTs has transformed human society from the information technology age to the knowledge age (Galbreath, 2000).

It is useful to provide an indication of the technology status in Africa. The statistics presented below do provide some indication of the technological context within which efforts to use ICT in education take place.

Country	Number of Schools	Schools with computers	Percentage schools with computers
Egypt	32,000	10,000	31.25
Ghana	35,000	500	1.43
Mozambique	7,000	20	0.29
Namibia	1,519	60	3.94
South Africa	28,000	5,000	17.36

Source: Isaacs (2002)

Of the countries depicted, South Africa has the highest penetration of radio per 1000 individuals at 316. Egypt has the highest percentage of computers in schools, at 31.25%. In Mozambique, only 20 schools currently have access to computers. In Ghana, 500 schools currently have access to computers (i.e. 1.43%). Across the continent, radio is the most widely available technology. Similarly, for South Africa, 17.36% schools have access to computer while 31.6% of people have access to a radio. These comparisons highlight the importance of using the most appropriate ICT for a given environment rather than the

focus of ICT and Education efforts on computers, specifically. Physical access to computers is a fundamental starting point, but alone will not lead to computer use or enhance learning outcomes. Teacher training is one essential requirement for successful use of ICT in education.

Isaacs (2000) in Gbenga (2006), identified the following factors in South Africa which prevent schools from using computers for teaching and learning:

- (i) insufficient funds;
- (ii) insufficient numbers of computers;
- (iii) lack of computer literacy among lecturers;

- (iv) lack of subject teachers trained to integrate computers into learning areas; and
- (v) the absence of properly developed curricula for teaching computer skills

In addition, many of those schools that do not have computers still do not have access to the Internet, which is an important requirement for supporting networking for learners and teachers, as well as for collaborative learning. The internet can provide a wealth of learning resources, access to which is, at present, very limited for many African education institutions. According to Isaac (2002) in Gbenga (2006), the main obstacles faced by African schools (and tertiary institutions too) with respect to Internet access specifically are:

- (i) Lack of infrastructure generally, and network infrastructure in particular;
- (ii) High telephone and internet costs;
- (iii) Limited expertise and ICT skills levels; and
- (iv) Lack of an enabling policy environment

Nigerian Minister of Science and Technology, Professor Turner Isoun, has stated that it would benefit Nigeria tremendously if she becomes part of the Global University System (GUS). The GUS is an initiative to educate students through a satellite or wireless telecommunications infrastructure, mostly using the Internet. It is widely acknowledged that ICTs can be used to improve the quality of teaching and learning in any tertiary institution. In fact, ICTs are becoming natural part of man's daily life; thus their use in education by staff (academic and non-academic) and students is becoming a necessity. Certainly, the

present and future academic global community will utilize ICTs to a high degree. This has made it imperative that lecturers not only need to use ICTs, but they need to become comfortable with using ICTs. This is to ensure that they participate fully in the life of the contemporary university and to accomplish their everyday task (Yusuf and Onasanya, 2004).

One sector of our national life that has embraced and is being influenced a great deal by the ICT revolution is the education sector. This development should be expected since the educational sector should normally set the pace for any form of innovation and change. In this sector, the ICT revolution is particularly more visible in the university system. This is because the National University Commission (NUC) as a matter of deliberate policy initiated the move to get Nigerian Universities to embrace ICT through its Nigerian Universities Management of Information System (NUMIS) project (Raymond, 2006).

There are presently at least nine ICT for education initiatives at various stages of development being carried out by the education coordinating agencies of government and the ministry of education. They include:

1. The Nigerian Universities Network (NUNet) Project
2. The Polytechnics Network (PolyNet) Project
3. The School Net Project
4. The Nigerian Education, Academic and Research Network (NEARNet)
5. The Teachers Network (TeachNet) Project
6. National Open University

7. National Virtual (Digital) Library (Ministry of Education/ NUC)
8. National Virtual Library (Ministry of Science and Technology/NITDA)
9. National Information, communication and education programme of the Presidency. (NUC, 2000).

The Study

There are currently 52 university centers and colleges of education who have their domain names registered while 15 are active email users. Most Nigerian tertiary institutions are already having computer study as part of their academic programs, most of them are still theoretical in nature to impact meaningfully on the society. The Nigeria University Commission recently established a virtual learning website but its impact is yet to be seen and it is too early to be assessed. In fact, ICT has had more impact on administrative services such as admissions, registration, fee payment and purchasing than on the fundamentals of classroom teaching and learning. But even if ICT has not revolutionized the classroom yet, it is changing the learning experience of students by relaxing time and space constraints as well as providing easier access to information (online journals and e-books; students portals; etc) an achievement that should not be downplayed (Organization for Economic Co-operation and Development, 2004)

However, this study is to investigate the availability and utilization of information and communication

technologies in federal government tertiary institutions in Niger State.

Purpose of the Study

This study aims at investigating the availability and level of utilization of Information and Communication Technology facilities/equipment in federal government owned tertiary institutions in Niger State. It also attempts to find out those factors that affect the use of ICT for teaching/learning in the classroom, and level of effective use of ICTs at different levels of tertiary institutions in Niger State, Nigeria.

Research Questions

The study specifically sought answers to the following research questions:

- (i) Are ICT facilities and equipment available for the effective teaching and learning in Niger State Federal Tertiary Institutions?
- (ii) Is there any difference between university, polytechnics and colleges of education as regards the availability of ICT facilities and equipment for teaching, learning and research work?
- (ii) Is there any difference between perception of university, polytechnics and colleges of education lecturers' with regards to the factors affecting the utilization of ICT facilities and equipment?
- (iii) Is there any difference between university, polytechnics and colleges of education lecturers' perception on the effective use of ICT facilities and equipment?

Research Hypotheses

The following hypotheses were formulated from the research questions and tested at 0.05 level of significance:

- (i) There is no significant difference between university, polytechnics and colleges of education as regards the availability of ICT facilities and equipment for teaching, learning and research work.
- (ii) There is no difference between perception of university, polytechnics and colleges of education lecturers' with regards to the factors affecting the utilization of ICT facilities and equipment.
- (iii) There is no significant difference between university, polytechnics and colleges of education lecturers perception on the effective use of ICT facilities and equipment.

Research Methods

Three Federal Government owned tertiary institutions in Niger State were selected for the study. One Hundred and fifty (150) lecturers participated in responding to the questionnaire. They cut across all the departments within the institutions, giving a total of 150 lecturers. Among the 150 lecturers, 50 respondents from each tertiary institutions participated in the study.

The Instrument

The instrument used for this study is a 35-item questionnaire designed by the researcher. The questionnaire focused on type of institutions. The instrument has three sections. Section A requires general

information on the availability of ICT facilities and equipment, section B was specifically designed to assess the factors affecting the use of ICT facilities and equipment; section C asks the extent of utilization of ICT facilities and equipment. 35-item questions of a five-point Likert scale with different interpretation were used. Section A were rated thus: 5 referred to Very Often Use (VOU), 4 referred to Often Use (OU), 3 referred to Sometimes Use (SU), 2 referred to Rarely Use (RU), while 1 referred to Not Available (NA). Other sections of the questionnaire were rated as 1 referred to Undecided (UD), while 5 referred to Strongly Agree (SA). In order to validate the instrument, the questionnaire was given to a computer educationist and two educational technologists to critically look at the face and content validity. Alpha reliability score of instrument was 0.85 meaning that it's suitable for the research.

Research Procedure

The researcher visited the institutions and some lecturers were chosen as research assistant. The questionnaire was administered on the first visit to the lecturers across all the departments. At second visits, the questionnaire was collected from the research assistants. 10-questionnaires mortality was discovered out of 160 questionnaires prepared for the research. After responses have been collated, they were sorted into different groups according to the research questions mentioned above. A questionnaire was not considered for analysis if it was not well completed (omission of items) and if the respondent gave contradictory information (evidence

that he did not understand the demand of some questions or was not honest in his response). Descriptive statistics were included to explain pattern of responses while one-way ANOVA was used to assess differences between groups of lecturers. Analyses were conducted at 0.05 level of significance.

Results and Discussion

Research Question: Are ICT facilities and equipment available for the effective teaching and learning in Niger State Federal Tertiary Institutions?

Table 1: Responses on the Availability and Utilization of ICT Facilities/Equipment for Effective Teaching and Learning in Niger State Federal Tertiary Institutions

S/N	ICT Facilities and Equipment	Mean (Univ)	Mean (Poly)	Mean (COE)	Grand Mean
1.	Desktop Computer for every Lecturer (connected to the Internet)	1.00	1.00	1.00	1.00
2.	Department Computer Laboratory	2.32	2.68	1.00	2.00
3.	Laptop connected to the net (for all lecturers)	1.00	1.00	1.00	1.00
4.	School Cyber café	4.34	2.82	2.82	3.32
5.	Institution Virtual Library (Digital Library)	1.30	1.34	1.00	1.21
6.	Institutional Web Site (www) & Functional E-mail Address	3.86	2.22	1.00	2.36
7.	Department e-mail address	1.32	2.62	1.00	1.64
8.	Electronics Class Roll (ECR)	1.18	1.00	1.00	1.06
9.	Examination Scoring Machine (OMR)	3.40	1.00	1.00	1.80
10.	Internally produced educational software	2.48	2.76	3.18	2.81
11.	Commercially produced educational software	2.38	2.44	2.78	2.53
12.	Computer Networking (Local Area Network/ Wide Area Network)	2.46	2.76	1.40	2.21
13.	Scanner, Printer and other accessories	2.56	3.58	3.38	3.17
14.	Multimedia Classrooms (Audio Visual Centre)	2.38	3.32	4.60	3.40
15.	Television set	1.80	2.60	3.58	2.66
16.	Satellite Dish for global information	2.10	3.10	2.38	2.52
17.	Close Circuit Television (CCTV)	1.00	1.18	1.00	1.06
18.	Audiotape player	1.48	3.16	3.76	2.80
19.	Videotape player	1.48	2.12	3.76	2.45
20.	Slide projector	2.12	2.68	3.00	2.60
21.	Power point multimedia projector	1.98	1.44	1.44	1.62
22.	Digital Video Cameras	2.42	1.88	2.18	2.16
23.	Overhead projector & Transparencies	2.58	3.00	3.60	3.06
24.	Opaque projector	1.58	2.10	4.26	2.64
25.	Projection screen	1.86	2.70	4.48	3.01

Result from table 1 column 1 indicate that the high mean scores of 4.34, 3.86, 3.40, 2.56 and 2.58 for items 4, 6, 9, 13, and 14 show that most of the respondents agreed with the items' statement on the availability of ICT facilities and equipment at university.

Table 1 column 2 indicate that the high mean scores of 2.68, 2.82, 2.62, 2.76, 2.76, 3.58, 3.32, 2.60, 3.10, 3.16, 2.68, 3.00 and 2.70 for items 2, 4, 7, 10, 12, 13, 14, 15, 16, 18, 20, 23 and 25 show that most of the respondents agreed with the items statement on the availability of ICT facilities and equipment at polytechnics.

Table 1 column 3 indicate that the high mean scores of 2.82, 3.18, 2.78, 3.38, 4.60, 3.58, 3.76, 3.76, 3.00, 3.60, 4.26 and 4.48 for items 4, 10, 11, 13, 14, 15, 18, 19,

20, 23, 24 and 25 show that most of the respondents agreed with the items statement on the availability of ICT facilities and equipment at colleges of education.

Table 1 column 4 indicate that the high mean scores of 3.32, 1.06, 2.81 2.53, 2.21, 3.17, 3.40, 2.66, 2.52, 2.80, 2.60, 3.06, 2.64 and 3.01 for items 4, 8, 10, 11, 12, 13, 14, 15, 16, 18, 20, 23, 24 and 25 show that most of the respondents agreed with the items statement on the availability of ICT facilities and equipment at all levels of tertiary institutions.

Hypothesis 1: There is no significant difference between university, polytechnics and colleges of education as regards the availability of ICT facilities and equipment for teaching, learning and research work.

Table 2: ANOVA Comparison of the Availability of ICT Facilities and Equipment for Teaching and Research in Tertiary Institutions.

Source of variable	Sum of Squares	df	Mean Squares	F – Value Calculated	F – Value Critical	P-value
Between Groups	1.05	2	0.53			
Within Groups	74.56	72	1.04	0.51 ^{ns}	3.12	0.605
Total	75.609	74				

ns- not significant at P>0.05 level

The result on table 2 reveals that there is no significant difference between universities, polytechnics and colleges of education's availability of ICT facilities and equipment for teaching and research work. The F-calculated value (0.51) is lesser than F-critical value (3.12) thus the hypothesis was not rejected.

Hypothesis 2: There is no gender difference between perception of university, polytechnics and colleges of education lecturers' with regards to the factors affecting the utilization of ICT facilities and equipment.

Table 3: ANOVA Comparison of the Lecturers' Perception with Regards the Factors affecting the Utilization of ICT Facilities and Equipment in Tertiary Institutions

Source of variable	Sum of Squares	df	Mean Squares	F – Value Calculated	F – Value Critical	P-Value
Between Groups	0.006	2	0.003			
Within Groups	3.894	15	0.260	0.011 ^{ns}	3.68	0.989
Total	3.900	17				

ns:- not significant at $P > 0.05$ level

The result on table 3 reveals that there is no significant difference between universities, polytechnics and colleges of education lecturers' perception on factors affecting the effective utilization of ICT facilities and equipment for teaching and research work. The F-calculated value (0.011) is lesser than F-critical value (3.68) thus the hypothesis was not rejected.

Hypothesis 3: There is no difference between perception of university, polytechnics and colleges of education lecturers' with regards to the factors affecting the utilization of ICT facilities and equipment.

Table 4: ANOVA Comparison of lecturers' Perceptions on the Effective Use of ICT Facilities and Equipment for Teaching and Research in Tertiary Institutions

Source of variable	Sum of Squares	df	Mean Squares	F – Value Calculated	F – Value Critical	P-value
Between Groups	234.02	2	117.01			
Within Groups	334.89	747	448.00	261.01*	3.00	0.001
Total	568.91	749				

*- significant at $P < 0.05$ level

Table 5: Scheffe's Post-hoc Test of the three Tertiary Institutions

Institutions	Number of respondents	Mean difference
Federal University	50	3.236
Federal Polytechnics	50	2.264
Federal College of Education	50	1.916

The result on table 4 reveals that there is significant difference between lecturers' perception on the effective utilization of ICT facilities and equipment in tertiary institutions. The F-calculated value (261.01) is higher than F-critical value

(3.00) thus the hypothesis was not rejected. However, Table 5 shows Scheffe's post hoc test, the Universities lecturers have highest mean scores, followed by polytechnics and colleges of education respectively. This indicates that the former makes more use of

ICT facilities and equipment than polytechnics and impact of ICT facilities and equipment is not felt at colleges of education.

Discussion of Findings

The world is fast becoming a global village, as a result of developments in information and communication technology (ICT). The challenge of integrating information and communication technology (ICT) into tertiary institutions is a very big task. It's obvious that there is little or no usage of ICT at this level of our educational system. Most institutions do not have the necessary ICT facilities for instruction and research neither do the lecturers possess skills in ICT for effective classroom interactions. Results from Table 1, reveals that only 5 out of 25 items agreed with the statements that ICT facilities are available at university while 13 out of 25 items agreed with statements on the availability of ICT facilities at polytechnics and 12 out of 25 items agreed with the statement that ICT facilities are available at colleges of education. From all the respondents, 14 out of 25 agreed with the statements that ICT facilities available at all levels of tertiary institutions. From the table 1, it can be deduced that 20%, 52% and 48% of respondents agreed on the availability of ICT facilities at universities, polytechnics and colleges of education respectively. Similarly, 56% of all respondents agreed that ICT facilities available at all levels of tertiary institutions in Niger State.

These findings corroborate with Kitschner (2003). They noted that inadequacies in human and material resources, poor funding, lack of

infrastructure, poor implementation of policies were some of the factors responsible for the situation. The position of this study is supported by the findings of Issac (2002) reported in Gbenga (2006) that there is gross inadequate provision of ICTs facilities and equipment in African schools. It is also in agreement with the findings of Association of African Universities (2000) which shows that ICT facilities and equipment were inadequate and factors such as poor telecommunication infrastructure, lack of enabling environment, non reliability of electricity supply and many others are obstacles in the introduction and utilization of ICTs in African universities. The level of inadequate supply of computers and ICTs facilities at Nigerian universities, polytechnics and colleges of education is worrisome.

Major Findings of the Study

- (i) The findings reveal that there are inadequate ICT facilities and equipment for teaching and research work in all levels of tertiary institutions.
- (ii) There was no significant difference between lecturers in tertiary institutions' perception as regards the factors affecting the effective use of ICT facilities and equipment.
- (iii) The available ICT facilities were not effectively used for learning, research and information services in the university.

Conclusions

Information and communication technologies (ICTs) offer innumerable

benefits in enhancing the quality and quantity of teaching and learning in tertiary institutions. Despite the prevalent nature of ICT in virtually every aspect of human endeavours, they have not been widely integrated into the teaching and learning process in schools. Factors such as lack of funds, computers, internet and network facilities are grossly inadequate in our tertiary institution. This invariably affects the effective use of the few ones available. For Nigerian to catch up with the developed world, ICT should be of great priority in tertiary institutions.

Recommendations

1. Computers centre and cyber café should be made available in each department in order to provide accessibility for the use of ICT facilities for teaching, learning and research purposes.
2. National University Commission, National Commission for Colleges of Education and National Board for Technical Education should provide the necessary ICT facilities and equipment to tertiary institutions.
3. Computers should be seen as tools for effective teaching, learning, research and information services therefore tertiary institutions should be well equipped with adequate, functional and well-furnished computer laboratory/cyber café for students and lecturers use.

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