Application of ICT (Information and Communication Technology) in the Management of Universities in the North-Central State of Nigeria

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This study investigated the application of ICT (information and communication technology) in the management of universities in the north-central Nigeria. The study was a descriptive survey. The population of the study comprised 1,294 respondents in federal and state universities (763 in federal and 531 in state universities). The sample size consists of 446 respondents, 280 in federal and 166 in state universities. These were selected through proportionate stratified random sampling technique. The instrument used for data collection was a 26-item questionnaire. Data collected were analyzed using mean and *SD* (standard deviation) to answer the specific research questions, while *t*-test statistic was used for the hypotheses. The findings of the study showed that ICT can be applied in the areas of accessing of results online, filling of students' personal data and for communication. A major constraint was non-supply of power to many universities and education centres. It was recommended among others that the federal and state government should improve on the training of students and staff in the use of ICT through seminars, workshops, and conferences.

Keywords: ICT (information and communication technology), management, university

Introduction

Education is very vital to the pace of social, political, cultural, technological, and economic development of any nation. This could be the reason why most nations of the world allocate a proportion of their GNI (gross national income) to the development of the educational sector. The educational system in Nigeria has been delineated into different levels namely pre-primary, primary, secondary, and tertiary institution levels of which university is inclusive.

Adekigbe (2005) defined university as a place of enlightenment, a place for exploring the frontiers, and an institution in which people through the process of socialization, are imbued with the ability, not just to discern things but also to apply theories to explain events, values, the knowledge of the natural order for the pursuits of the common good, and the individual well-being. University is also a place for training high-level manpower and for equipping the individuals to determine their level of performance of future roles. The state of universities in Nigeria seems to be poor. This may be partly as a result of the use of obsolete equipment in data

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collection, processing, storage, and retrieval. The consequences of this may include examination malpractices, cultism, delay in students' admission, sharp practices in allocation of hostel accommodation, computation of student's results, and inadequate communication between students and staff. The prevalent use of obsolete equipment, such as drawer, typewritten machine, cabinet, notice board, and stationeries for staff's and students' personnel services has made universities in Nigeria to lag behind in the world university ranking. This is evident from world universities ranking of 2010 in which no university in Nigeria was ranked among the 200 universities in the world in the use of ICT (information and communication technology) in academic and administrative functions (NUC (National University Commission), 2006).

Becta (2008) defined ICT as technology that is used to process, store, transmit, communicate, create, or exchange information. In order words, ICT is the computing and communication facilities in education. In the context of this paper, ICT refers to technical systems that receive, manipulate, process, and store data. It facilitates student data management. With developments in information technology in the past decades, it is expected that ICT will be used to meet the challenges of modern-day university administration. Application of ICT in university will enhance administrative work, reduce occupational stress, and improve students' academic performance. The prominent role of ICT could be seen in advancing knowledge and skills necessary for effective functioning in the modern world. There is therefore the need to integrate ICT in universities in north-central Nigeria for effective management.

Management of university refers to the process of planning, organizing, directing, staffing, coordinating, budgeting for, and reporting on university education system and activities. Obi (2003) defined management as a process designed to ensure the cooperation, participation, intervention, and involvement for effective achievement of university education goals. In other words, management is a social interaction process involving sequence of coordinated events, such as planning, organizing, controlling, supervising, budgeting, and evaluating in order to use available human and material resources to achieve a desired outcome in the fastest and most efficient manner in universities in the north-central zone.

North-central zone is one of the geo-political zones among the six zones in Nigeria where there are several universities that share some peculiarities, such as staff personnel and student personnel services in the management of universities. The fact that universities in north-central zone are witnessing a tremendous growth in student enrolment has made the management of universities in north-central zone complex, thereby, creating challenges ranging from the management of staff data, student data, affective records keeping, computation of students results, course registration, supervision of students on campus, and management of school finance. In support of the above view, Adeyemi (2007) argued that there was no time in the history of education in Nigeria when schools and administrators have been faced with such multitudes of challenges. According to him, administrative functions in universities are becoming increasingly complex in terms of enrolment, delay in computation of result and allocation of hostel accommodation.

The introduction of ICT in the management of universities could become an antidote in providing effective solutions to staff personnel and student personnel problems that otherwise would have been difficult, if not impossible. Commenting on the relevance of student data to the university institution, Nwosu (2003) noted that for educational development, personnel, educational planners, and administrators need to have adequate and accurate data of students' enrolment and students' school records through the use of ICT for effective planning and management of the university education system.

There is no doubt, therefore, that the management of universities has become more complex, hence, its management demands more from the administrators. The enormous rise in the number of students in the universities as well as the multiplicity of programmes have made university personnel to handle a very large quantity of data which must be accessed speedily in order to provide information for the university administration, NUC and Ministry of Education for effective management and decision-making processes. Hence, the use of ICT in the management of universities becomes imperative.

It has, however, been observed that in many universities in north-central zone, ICT tools like computer, internet satellite, and other telecommunication technologies that can aid teaching learning and administrative functions are necessary for university management. It is against this background that the study sought to find out the application of ICT in the management of universities in north-central zone of Nigeria.

The Statement of Problem

The tasks of meeting the needs of university students in developing countries, Nigeria inclusive, are very demanding. Researchers, the government, and the general public have expressed considerable concern on the need for the integration of ICT in the administration of university system. This is because when ICT facilities are provided and utilized, it reduces occupational stress, which will result in greater administrative efficiency and academic productivity.

It has been observed, however, that ICT facility seems not to have been applied in the management of universities in north-central zone of Nigeria. This may be as a result of inadequate provision of ICT facilities, power failure, computer illiteracy, and lack of training of students and personnel in the use of ICT. The problem of this study, therefore, is to find out how ICT can be applied in the management of universities in north-central zone of Nigeria.

The Purpose of the Study

Specifically, the study sought to:

(1) Find out areas in which ICT can be applied in the management of universities;

(2) Ascertain the procedures for the application of ICT in the management of universities;

(3) Determine likely problems that could hinder the application of ICT in the management of universities.

Research Questions and Hypotheses

Research Questions

The following research question guided the study:

(1) In what areas can ICT be applied in the management of universities?

(2) What are the procedures for the application of ICT in the management of universities?

(3) What are the likely problems that could hinder the application of ICT in the management universities?

Hypotheses

The following null hypotheses formulated at 0.05 level of significance guided the study:

Ho_1: There is no significant difference in the mean scores of personnel in federal and state universities on areas in which ICT can be applied in the management of universities;

Ho_2: There is no significant difference in the mean ratings of personnel in federal and state universities on the likely problems that could hinder the application of ICT in the management of universities.

Methodology

The study was a descriptive survey design conducted in Nigeria which is one of the West African counties. Nigeria in divided into six geopolitical zones (north-central, north-east, north-west, south-east, south-south, and south-west). The study was delimited to north-central zone. The zone is made up five federal and six states universities approved by NUC (2006). The populations for the study comprise 1,294 personnel in federal and state universities in the north-central (763 in federal and 531 in state universities). The sample size consists 446 respondents made up of 280 personnel in federal and 166 personnel in state universities. Proportionate stratified random sampling technique was used to select two federal and two states universities. In each of the universities, a department was randomly selected (library, student affairs, MIS (management information system), and bursary). Two hundred and eighty personnel were randomly drawn from the two federal universities while 166 were also drawn from the two state universities.

The instrument for data generation was questionnaire titled "AICTMUQ (Application of ICT in the management of universities questionnaires)". The questionnaire was clustered into three sub-headings according to the three research questions. The items were presented on a 4-point scale: SA ("Strongly agree"), A ("Agree"), D ("Disagree"), and SD ("Strongly disagree"). The items were developed from information obtained from literature review based on the three research questions. The instrument was validated using face and construct validity. The validated instrument was trial-tested to ascertain the reliability of the instrument. The reliability co-efficient obtained using Cronbach's alpha was 0.71. The instrument was administered by the researchers with the help of research assistant. The data collected were analyzed using mean and *SD* (standard deviation) to answer the research questions while the *t*-test statistic was used in answering the two null hypotheses. Items of the research questions with mean score of 2.50 and above were regarded as accepted while any item with a mean score below 2.50 was rejected. This is because a 4-point rating scale was used for generating the data and the mid-point of the scale is 2.5.

Results

The results of the study are presented in Tables 1−5 according to the research questions and hypotheses that guided the study.

Table 1 presents the responses of respondents in federal and state universities on areas in which ICT can be applied in the management of universities. A look at the table shows that item 1−10 are rated 2.98, 3.06, 3.27, 3.05, 3.14, 3.43, 3.12, 3.36, 3.23, and 3.05 for federal universities, while the respondents in state universities rated the same items with mean score of 3.17, 3.21, 3.43, 2.96, 2.87, 3.05, 3.29, 2.99, and 3.31. This implies that both respondents in federal and state universities in north-central zone agree that registration of students, allocation of hostel accommodation, accessing of result online, among others are areas in which ICT can be applied in the management of universities.

Table 2 indicates the opinion of personnel in federal and state universities on procedures for application of ICT in the management of student personnel services. Table 2 shows that items 11−17 have mean score of 2.86, 3.04, 2.90, 3.32, 3.27, 2.94, and 2.15 for federal universities, while state universities rated the same items with 3.17, 3.29, 3.18, 3.17, 3.01, 3.11, and 1.86. Item 17 has low mean score of 2.15 for federal and 1.86 for state universities, respectively. The respondents, however, disagree with legislative support in the use ICT. This could be as a result of the existing national policy on ICT that supports the integration of ICT in the

management of universities.

Table 1

Mean Responses on Areas for the Application of ICT in the Management of Universities

S/N	Items	Federal universities			State universities		
		X	SD	Dec.	X	SD	Dec.
1	Registration of students	2.98	1.09	A	3.17	0.88	A
2	Allocation of hostel accommodation	3.06	0.97	A	3.21	0.97	A
3	Accessing of result online	3.27	0.87	A	3.43	0.83	A
4	Communication among students and lecturers	3.05	0.98	A	2.96	0.99	A
5	The use of ICT for computation of result	3.14	0.92	A	3.23	0.82	A
6	The use of ICT for records keeping	3.43	0.70	A	2.87	0.92	A
7	Orientation of new students	3.12	0.98	A	3.05	1.13	A
8	Counseling services	3.36	0.80	A	3.29	1.04	A
9	Filling of personal data	3.23	0.84	A	2.99	1.11	A
10	Use of ICT for publication of results	3.05	0.98	A	3.31	1.03	A
Grand mean		3.16		A	3.15		A

Table 2

Mean Responses on the Procedures for the Application of ICT in the Management of Universities

S/N	Items	Federal universities			State universities		
		X	SD	Dec.	X	SD	Dec.
11	Training of personnel/students on ICT	2.86	1.06	A	3.17	0.82	A
12	Availability of ICT facilities for application	3.04	1.00	A	3.29	0.94	A
13	Regular maintenance of available facilities	2.90	1.11	A	3.18	0.94	A
14	Organizing seminar, workshop, and talk on application	3.32	0.79	A	3.17	0.84	A
15	Adequate funding of university education for ICT provision	3.27	0.91	A	3.01	0.90	A
16	Becoming producers of ICT facilities to reduce cost	2.94	1.08	A	3.11	0.90	A
17	Legislative support for use of ICT	2.15	1.08	D	1.86	0.98	D
Grand mean		2.92		A	2.97		A

Table 3

Mean Responses on Likely Problems That Might Hinder the Application of ICT

S/N	Items	Federal universities			State universities		
		X	SD	Dec.	X	SD	Dec.
18	Insufficient ICT facilities for application	2.91	1.05	A	3.14	0.90	A
19	Lack of coherence in the national ICT policy	2.35	1.14	D	1.85	0.95	D
20	Poor maintenance of ICT facilities	3.08	0.99	A	3.02	1.04	A
21	Resistance to change	2.54	1.16	A	3.29	0.90	A
22	Lack of funds to procure ICT facilities	3.03	0.96	A	3.25	0.01	A
23	High cost of ICT resources	3.10	1.02	A	3.04	1.92	A
24	Intermittent disruption of electricity	3.28	0.92	A	3.35	1.07	A
25	Fear of using ICT facilities	3.21	0.91	A	2.84	1.05	A
26	Lack of training in the use of ICT	2.95	1.06	A	2.72	1.11	A
Grand mean		2.93		A	2.94		A

Table 3 shows the views of respondents on likely problems that might hinder the application of ICT in the management of universities. Looking at Table 3 indicates that apart from item 19 which has mean score of 2.35

for federal and 1.85 for state university, all the other items have mean ratings above the criterion mean score of 2.50 for both federal and state universities in north-central zone. Item 24 intermittent disruption of electricity has the highest mean score of 3.28 and 3.35 for federal and state universities.

Ho$_1$

There is no significant difference in the mean ratings of respondents in federal and state universities with regard to areas in which ICT can be applied in the management of universities.

Table 4

Summary of T-test Analysis on Areas in Which ICT Can Be Applied Is the Management of Universities

S/N	Source	*N*	*X*	*SD*	*df*	Level of sig.	*t*-cal.	*t*-value	Dec.
1	Federal universities	280	3.16	0.90	444	0.05	0.41	1.96	Not sig.
2	State universities	166	3.15	0.96					

Table 4 shows the calculated *t*-value is 0.41 at 444 degree of freedom and at 0.05 level of significance. Since the calculated *t*-value of 0.41 is less than the *t*-value of 1.96, the null hypothesis of the study in accepted as stipulated. Therefore, there is no significant difference in the mean ratings of respondents in federal and state universities on area in which ICT can be applied in the management of universities.

Ho$_2$

There is no significant difference in the mean ratings of respondents in federal and state universities with regard to likely problems associated with the application of ICT in management of universities.

Table 5

Summary of T-test Analysis on Likely Problems That Might Hinder the Application of ICT in the Management of Universities

S/N	Source	*N*	*X*	*SD*	*df*	Level of sig.	*t*-cal.	*t*-value	Dec.
1	Federal universities	280	2.93	1.02	444	0.05	0.54	1.96	Not sig.
2	State universities	166	2.94	0.88					

Table 5 shows that the calculated *t*-value of 0.54 at 444 degree of freedom and 0.05 level of significance is less than the *t*-value of 1.96. Since the calculated *t*-value of 0.54 is less than the *t*-value of 1.96, the second null hypothesis of the study is accepted. Therefore, there is no significant difference in the mean ratings of personnel in federal and state universities on the likely problems that might hinder the application of ICT in the management of universities.

Discussion

Based on the results of the data analysis, it is obvious that there are similarities in the responses of the respondents in federal and state universities. The findings on areas in which ICT can be applied in the management of universities include accessing of result online, filling of students' personal data, communication among students, registration of courses, and the use of ICT in records keeping.

The findings are in agreement with the view of Adeyemi and Olaleye (2010) who opined that the application of ICT is necessary in the collection of student data, recording of student results, and for effective keeping of student records. Data of various types could be programmed into the computer and retrieved at a later date when needed. Results from respondents agreed with the hypothesis made that there is no significant

difference between the mean ratings of personnel in federal and state universities with regards to areas in which ICT can be applied in the management of universities.

These responses and results of most of the analytical findings are supportive in accepting the null hypothesis as stated above that there is no significant difference in the mean ratings on areas in which ICT can be applied in the management of student personnel service in universities.

In the case of procedures for the application of ICT in the management of universities, the respondents are in agreement that procedures to be adopted include training of personnel/students in the use of ICT, availability of ICT facilities, regular maintenance of available ICT facilities and school administration to organize seminar, and conferences and talk on the use of ICT. Adeosun (2002) was of the view that through these processes, the problems of application of ICT are identified and solutions discussed between the university administration and university personnel to improve the application of ICT in universities.

Similarly, both personnel in federal and state universities agree that likely problems that might hinder the application of ICT in the management of universities include intermittent disruption of electricity, lack of funds to procure ICT facilities, and poor maintenance of available ICT facilities. The findings is in line with the findings made by Onifade (2003) which indicated that the use of ICT has been handicapped by non-supply of electricity to many schools and education centers. The problem of lack of fund identified in this study agreed with the findings made by Alebiosu (2000) who reported that financial allocation to the education sector was low. This implies that university administration could not procure ICT equipment needed for the management of universities. The result from the respondents agrees with the second hypothesis which stated that there is no significant difference between the mean ratings of personnel in federal and state universities on likely problems that might hinder the application of ICT in the management of universities in north-central Nigeria.

Conclusions and Recommendations

Considering the findings of the study, it was concluded that there are areas in which ICT can be applied in the management of universities. This is evident in the findings of this study which indicated a high level of application in the collection of student data, computation of results, records keeping, and allocation of hostel accommodation. However, students and personnel require training in the use of ICT for effective management. The findings have led the researchers to conclude that provision of ICT facilities is significantly related to procedures for improving the application of ICT in the management of student personnel services. It was, therefore, concluded that intermittent disruption of electricity and lack of adequate funds to procure ICT equipment are major problems inhibiting the application of ICT in the management of universities in north-central Nigeria.

Based on the findings of this study, the following recommendations were made:

(1) Federal and state governments should provide adequate funds for the purchase of ICT facilities in the universities;

(2) Non-governmental agencies that are concerned with university education should be able to purchase some of ICT facilities for staff and students;

(3) Relevant skills for maintenance and acquisition of software for computation of students' semester results, registration of students and other management functions should be developed through training by university administration;

(4) University administration should also endeavor to make internet facilities available in all offices for staff use.

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