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# Impact of Information and Communication Technology on the Management of Public Universities in Benue State, Nigeria

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## ABSTRACT

The study investigates the impact of information and communication technology (ICT) on the management of public Universities in Benue State. Four research questions and two hypotheses guided the study. The study adopted the quantitative research design using the descriptive survey method. The population of the study is 1,748 comprising all the staff of the public Universities in Benue State, of which 446 staff were sampled through the cluster, random sampling and Yamane Taro's sampling technique. A validated instrument titled "Impact of ICT on Management of Universities Questionnaire (IICMUQ)" was used with a reliability coefficient of 0.81 via Cronbach Alpha analysis was used for data collection. The research questions were analysed using percentages, mean and standard deviation and t-test statistic was used to test the hypotheses. The results of the study evidence that the level of ICT facilities available in Universities in Benue State is low as well as the level of computer knowledge by University staff in Benue State, ICT has a low impact on the management of admissions and finance in Universities in Benue State, and the perception of staff in the Federal and State University in Benue State on the impact of ICT on the management of admissions and finance is not significantly different. Consequently, the study recommended that among others that the University management should boost the availability of ICT facilities in Universities in Benue State.

*Keywords:* management, information and communications technology, admissions, finance.

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# Impact of Information and Communication Technology on the Management of Public Universities in Benue State, Nigeria

Peter Kanyip Bakwaph<sup>α</sup> & Grahams Mimmingu Tor<sup>σ</sup>

## ABSTRACT

*The study investigates the impact of information and communication technology (ICT) on the management of public Universities in Benue State. Four research questions and two hypotheses guided the study. The study adopted the quantitative research design using the descriptive survey method. The population of the study is 1,748 comprising all the staff of the public Universities in Benue State, of which 446 staff were sampled through the cluster, random sampling and Yamane Taro's sampling technique. A validated instrument titled "Impact of ICT on Management of Universities Questionnaire (IICMUQ)" was used with a reliability coefficient of 0.81 via Cronbach Alpha analysis was used for data collection. The research questions were analysed using percentages, mean and standard deviation and t-test statistic was used to test the hypotheses. The results of the study evidence that the level of ICT facilities available in Universities in Benue State is low as well as the level of computer knowledge by University staff in Benue State, ICT has a low impact on the management of admissions and finance in Universities in Benue State, and the perception of staff in the Federal and State University in Benue State on the impact of ICT on the management of admissions and finance is not significantly different. Consequently, the study recommended that among others that the University management should boost the availability of ICT facilities in Universities in Benue State. In addition, Universities in Benue State need to enhance the computer skills level of their staff. Management of admissions and finance should be enhanced*

*by the seamless integration of its processes with ICT by using a web portal from the point of application, screening shortlisting, issuance of admission letters, registration and matriculation and automation of accounting and financial processes.*

**Keywords:** management, information and communications technology, admissions, finance.

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## I. INTRODUCTION

The success of University education especially in the 21<sup>st</sup> Century would not only be determined based on the provision of adequate educational resources such as academic and non-academic staff, funds, school facilities, equipment and instructional materials as the paramount issue among the above factors that would facilitate the successful operation of the University system is the nature of management (Usman, 2016). The complex nature of the University system, as a result of regular expansion in terms of the introduction of additional academic programmes, has brought about the increment in the high level of enrolment and staff employment. As such, the operations of the University system become complex and require proper management through the enhancement of effective financial management, planning, decision-making, control and monitoring of students and staff activities. Effective decision-making is an essential element as well as the major responsibility of all the

administrators of Universities (Ekundayo & Ajayi, 2017).

Management signifies the pursuit of organizational goals efficiently and effectively by integrating the work of people through planning, organising, leading and controlling the organization's resources (Williams & Kinicki, 2018). It is the arrangement of tasks required to control the operations and activities of a Stated plan to achieve the objectives of an institution.

The inefficiencies associated with the creation, storage, preservation, and presentation of large information in paper form make managerial processes in the University system very cumbersome (Makewa, Meremo, & Role, 2013). Consequently, alternative means provided by Information Communication Technology (ICT) becomes very vital which prompted the Federal Ministry of Education in Nigeria to revive the existing ICT policy on the management of Universities in Nigeria. The major aspect of the policy is to ensure that ICT systems for education administration are in place and all necessary common infrastructure for the storage and management of the ensuing data are provided for all educational institutions and establishments (FME, 2019).

Information and Communications Technology (ICT) is the technology that supports activities involving the creation, storage, manipulation and communication of information. The application and use of ICT have led to the emergence of different forms of microelectronic and telecommunications tools such as laptops and computers, computer networks, the Internet, digital printers and mobile technology, which enable managers or administrators to record, store, process, retrieve, and transmit information (Adebayo, 2012). Due to these rapid changes, there is a growing demand for educational institutions to integrate ICT in all their management endeavours. ICT integration plays a vital role in supporting powerful and efficient school management in the education sector. Information communication technology can improve or enhance the management tasks of Universities (Harerimana & Mtshali, 2019).

Management of admissions in Universities involves activities starting from the advertisement of applications, and sale of application forms to prospective students, which are filled and submitted concerning the various programmes offered in the University. Some pre-admission screening is carried out in some programmes and the successful candidates are offered admission letters. The automation of these processes makes them more effective and efficient as it reduces the time spent on these activities mentioned above (Adetunji, 2015). The type of ICT used here includes but is not limited to desktop computers, University websites, printers, examination scoring machines, telephones and so on. Admission in the University system could be managed using different software such as the admissions and enrolment management software which helps school administrators to run the entire student admissions and enrolment process, from processing applications to handling application-related fee payments. The software can be designed to contain student application processing functionality, email marketing, scheduling and real-time application progress tracking tools.

Management of finance in Universities involves acceptance of payments, auditing, wages and salaries, budgeting and financial appraisals. Other activities involve keeping fees registers, cash books, petty cash books, accounts records registers and receipt books, ledgers, and other financial management books. The use of computer and accounting software has improved the workflow in financial management in Universities (Mbithi, 2017). ICT that can be applied here is accounting software, printers, computers, scanner, internet access, currency counting machine, photocopier and so on.

It is quite unfortunate that Universities in Benue State are yet to fully integrate ICT into the management of the University system as staff members still go through the laborious exercise of manual registration of students to keep accurate students records, and the bursary staff still perform the task of financial management through the manual keeping of documents,

manual payment of bills, manual screening and registration of students in the 21<sup>st</sup> Century that is tagged as the “Computer Age”. The above situations could reduce the level of effectiveness and efficiency in the management of the University system (Agboeze, Ugwoke, & Onu (2012). Hence, this study investigated the impact of Information and Communication Technology on the Management of Public Universities in Benue State, Nigeria.

## II. STATEMENT OF THE PROBLEM

The government, researchers and the public have raised concerns about the need for the integration of ICT in the administration of the University system. It is a fact that when ICT facilities are utilized, it minimizes occupational stress, which results in efficiency and effectiveness. However, there are concerns about how information is managed in Universities in Benue State. There are cases of vital documents getting lost through human activities, fire incidence, flooding or natural disasters. Financial records are tempered with resulting in loss of revenue to the Universities and loss of wages by staff and falsification of school fee receipt by students. Management decisions are delayed when tasks are done manually as opposed to the use of ICT, which is considered a standard in managerial activities. The concern of this study is to investigate the extent to which ICT facilities are available in Universities in Benue State, and the ICT skills the University managers possessed to utilize these facilities in the areas of management of admissions and finance in public Universities in Benue State.

### *Research Questions*

- i. What is the level of availability of ICT facilities in Universities in Benue State?
- ii. What is the level of computer knowledge by University managers in Benue State?
- iii. What is the impact of ICT on the management of admissions in Universities in Benue State?
- iv. To what extent does ICT influence financial management in Universities in Benue State?

### *Hypotheses*

- HO<sub>1</sub>: There is no significant difference in the perception of Federal and State University staff on the impact of ICT on the management of admissions in Universities in Benue State.
- HO<sub>2</sub>: There is no significant difference in the perception of Federal and State University staff on the impact of ICT on financial management in Universities in Benue State.

## III. RESEARCH METHODOLOGY

This study adopted the quantitative research design using the descriptive survey method. The population of the study is 1,748 staff in all the public Universities in Benue State namely: Federal University of Agriculture, Makurdi and Benue State University, Makurdi (1,087 Federal-owned and 661 State-owned). A sample size of 446 was drawn using the cluster, random and Yamane Taro’s formula (1973) sampling. A structured questionnaire titled “Impact of ICT on Management of Universities Questionnaire” (IICMUQ) and a checklist were used to collect data, which were clustered according to the four research questions: Respondent’s Checklist on availability of ICT facilities, the level of computer knowledge by University managers, the relationship between ICT and management of admissions in Universities and ICT and management of Finance. A validation index of 84.61 was obtained using the split-half method and Cronbach’s alpha, a reliability coefficient of 0.81 was obtained as an internal reliability index of the instrument. Percentages, Mean and Standard Deviation were used to analyse the research questions while t-test statistic was employed for the two null hypotheses at a 0.05 level of significance. A mean score of 2.50 and above was considered acceptable whereas any item with a mean score below 2.50 was considered rejected.

Findings

Research Question 1: What is the level of availability of ICT facilities in Universities in Benue State?

Table 1: Response to ICT resources available in Universities in Benue State

S/N	ICT Resource	University of Agriculture, Makurdi (UAM)			Benue State University, Makurdi (BSU)		
		No.	%	Decision	No.	%	Decision
1.	Desktop computer	191	70.22	A	109	67.70	A
2.	Printing machine	50	18.38	NA	137	50.37	A
3	Scanning machine	45	16.54	NA	55	20.22	NA
4	Photocopy machine	37	13.60	NA	61	22.43	NA
5	Facsimile machine	74	27.21	NA	82	30.15	NA
6	CD-ROMs	64	23.53	NA	71	26.10	NA
7	USB flash drive	38	13.97	NA	141	51.84	A
8	External Hard Disk	60	22.06	NA	71	26.10	NA
9	Projector	49	18.01	NA	101	37.13	NA
10	Intercom	45	16.54	NA	19	6.99	NA
11	Internet Access	160	58.82	A	138	50.74	A
12	University Website	228	83.82	A	144	52.94	A
13	Digital Camera	70	25.74	NA	63	23.16	NA
14	Television	32	11.76	NA	48	17.65	NA
15	Telephone	159	58.46	A	142	52.21	A
16	CCTV	66	24.26	NA	51	18.75	NA
17	Biometric Scanner	83	30.51	NA	73	26.84	NA
18	DVD Player	94	34.56	NA	92	33.82	NA
19	Typewriter	113	41.54	NA	28	10.29	NA
20	Radio	87	31.99	NA	79	29.04	NA
21	Currency Counter	79	29.04	NA	48	17.65	NA
	Average %		31.93	NA		32.01	NA

Scale % = 50% Key: A=Available, NA=Not Available

Table 1 shows computed responses in percentages for the University of Agriculture, Makurdi, and Benue State University. A total “available” percentage greater than 50% is adjudged to be available whereas those not totalling up to 50% are taken as “not available.” The available ICT facilities at the University of Agriculture, Makurdi include University website (83.84%), Desktop computer (70.22%), Internet Access (58.82%) and Telephone (58.46%). The ICT facilities having a percentage less than “50%” are considered not available. Such facilities in UAM are a Printing machine, Scanning machine, Photocopy machine, Facsimile machine, CD-ROMs, USB flash drive, External Hard Disk, Projector, Intercom, Internet Access, Digital Camera, Television, CCTV,

Biometric Scanner, DVD Player, Typewriter, Radio and Currency Counter. An average of 31.93% reveals that the availability of ICT facilities at BSU is very low. For Benue State University, Makurdi, the ICT facilities in Table 1 adjudged to be available include Desktop Computer (67.70%), the University Website (52.94%), Telephone (52.21%), USB flash drive (51.84%), Internet access (50.74%) and Printing machine (50.37%). An average of 32.01% shows that the availability of ICT facilities at the University of Agriculture, Makurdi is very low.

*Research Question 2: What is the level of computer knowledge by University managers in Benue State?*

*Table 2: Responses on Level of computer knowledge by University managers in Benue State*

S/N	Items	Federal University			State University		
		X	SD	Dec.	X	SD	Dec.
1.	Creating presentations using packages like MS-PowerPoint.	2.08	1.09	L	1.17	0.88	L
2.	Transferring of files from a device to a computer e.g., “desktop” or “my document”	2.06	0.97	L	2.21	0.97	L
3.	Printing of documents from my computer to a printer	2.27	0.87	L	2.43	0.83	L
4.	Computations using spreadsheet packages like MS-Excel.	2.05	0.98	L	2.06	0.99	L
5.	Creation of a new e-mail address	2.14	0.92	L	2.23	0.82	L
6.	Searching the internet for information.	2.43	0.70	L	2.08	0.92	L
7.	Sending of ordinary emails and with attachment	2.12	0.98	L	3.05	1.13	H
8.	Accessing databases stored on CD-ROMs and DVDs	2.00	0.80	L	2.29	1.04	L
9.	Save files into a USB flash drive and retrieve them.	2.23	0.84	L	2.19	1.11	L
10.	Connecting to the internet through a Wifi hotspot.	2.15	0.98	L	2.11	1.03	L
	Average Mean	2.15		L	2.18		L

*Key: H = High, L = Low, Dec.= Decision*

Table 26 shows the responses on the level of computer knowledge by University managers in Benue State. An examination of the table reveals that in the Federal University of Agriculture, Makurdi, items 1-10 is measured at 2.08, 2.06, 2.27, 2.05, 2.14, 2.43, 2.12, 2.00, 2.23 and 2.15 with an average mean of 2.15, which is below the mean scale of 2.50. This means that the level of computer knowledge by the staff of the Federal University of Agriculture, Makurdi is low.

2.21, 2.43, 2.06, 2.23, 2.08, 3.05, 2.29, 2.19 and 2.11 in the same order. A mean average of 2.18 shows that the level of computer knowledge among the staff of the State University is also low.

From Table 2, the average mean values of 2.45 for the Federal University and 2.46 for the State University respectively showed that the staff of both Universities possess a low level of computer knowledge.

In Benue State University, respondents have the rates of the same items with a mean score of 1.17,

*Research Question 3: What is the impact of ICT on the management of admissions in Universities in Benue State?*

*Table 3: Responses on the impact of ICT on the management of admissions in Universities in Benue State*

S/N	Items	Federal University			State University		
		X	SD	Dec.	X	SD	Dec.
11.	The University receives admission applications through the admissions portal or website.	2.86	1.06	A	2.62	0.82	A
12.	Shortlisted candidates are posted on the University’s website.	2.60	1.00	A	2.39	0.94	A

13.	Prospective students can process their admission in the comfort of their homes without travelling.	2.40	1.11	D	2.48	0.94	D
14.	Issuance of the Admission Letter is done electronically.	2.32	0.79	D	2.45	0.84	D
15.	Advertisements for admission are done using the internet.	2.44	0.91	D	2.33	0.90	D
16.	Registration of admitted students is carried out through the University's portal.	2.19	1.08	D	3.11	0.90	A
17.	Processing admissions is only done electronically.	2.35	1.08	D	1.86	0.98	D
	Grand Mean	2.45		D	2.46		D

Key: A = Agree, D = Disagree, Dec. = Decision

Table 3 depicts the responses of University managers on the impact of ICT on the management of admissions in Universities in Benue State. Table 3 indicates that the questionnaire items 11 to 17 carry a mean score of 2.86, 2.60, 2.40, 2.32, 2.44, 2.19 and 2.35 for the Federal University of Agriculture, Makurdi. A grand mean score of 2.45 indicates that there is a low impact of Information and Communication Technology on the management of admission in

the University. Responses in the State University for items 11 to 17 with 2.62, 2.39, 2.48, 2.45, 2.33, 3.11 and 1.86 respectively with a grand mean of 2.46 shows that there is a low impact of ICT on the management of admissions in Benue State University, Makurdi. A grand mean less than 2.50 for both the Federal and State University of 2.45 and 2.46 respectively shows that ICT has a low impact on the management of admissions in Universities in Benue State.

**Research Question 4:** To what level does ICT influence financial management in Universities in Benue State?

**Table 4:** Responses to ICT influence on financial management in Universities in Benue State

S/N	Items	Federal University			State University		
		X	SD	Dec.	X	SD	Dec.
18.	The University carries out most of its financial transactions using the software.	2.91	1.05	A	2.58	0.90	A
19.	An electronic currency counting machine is used to count money.	2.35	1.14	D	1.85	0.95	D
20.	The University does its financial audit through the use of computers.	2.08	0.99	D	2.51	1.04	A
21.	Annual budgets for units/departments are prepared using MS-Excel.	2.54	1.16	A	2.29	0.90	D
22.	Payment of salaries is automated through an electronic system.	2.50	0.96	A	2.65	0.01	A
23.	Using an automated payment system has minimized the loss of income by staff	2.10	1.02	D	2.04	1.92	D
24.	Payment of school fees is efficient and time-saving	2.28	0.92	D	2.56	1.07	A
25.	There is more financial accountability with the use of electronic accounting.	2.21	0.91	D	2.24	1.05	D
26.	The University only accepts online payments.	2.05	1.06	D	2.13	1.11	D
	Grand Mean	2.34		D	2.32		D

Key: A = Agree, D = Disagree, Dec. = Decision

Table 4 shows the respondents' views on how ICT influences the management finance in Universities in Benue State. A closer look at Table 4 with items 18-26, under the Federal University, reveals that only items 18, 21 and 22 have a mean score of 2.91, 2.54 and 2.50 respectively above the

criterion scale of 2.50. The rest of the items have mean ratings below 2.50. A grand mean of 2.34 was adjudged 'Disagreed.'

At Benue State University, Makurdi, items 18, 20, 22 and 24 have a mean score of 2.58, 2.51, 2.61

and 2.56 respectively. The rest of the items 19, 21, 23, 25 and 26 have ratings of 1.85, 2.29, 2.04, 2.24 and 2.13 respectively falling below the criterion mean of 2.50. A grand mean of 2.32 was considered as 'Disagreed.'

With the two means of 2.34 and 2.32 below the scale mean, it means that ICT has a low influence on financial management in Universities in Benue State.

*Hypothesis 1:* There is no significant difference in the perception of Federal and State University staff on the impact of ICT on the management of admissions in Universities in Benue State.

*Table 5:* Summary of t-test Analysis on the perception of Federal and State University staff on the impact of ICT on the management of admissions in Universities in Benue State.

S/N	Source	N	X	SD	df	Sig.	t-cal	t-value	Decision
1	Federal University	272	2.45	0.90					
					431	0.05	0.41	1.96	Not Significant
2	State University	161	2.46	0.96					

*Not Significant at df=431; P>0.05; t-calculated < t-tabulated*

Table 5 shows the calculated *t*-value is 0.41 at a degree of freedom of 431 and a 0.05 significance level. Since the calculated *t*-value of 0.41 is less than the *t*-value of 1.96, the null hypothesis for the study is retained. Therefore, there is no significant

difference in the perception of Federal and State University staff on the impact of ICT on the management of admissions in Universities in Benue State.

*Hypothesis 2:* There is no significant difference in the perception of Federal and State University staff on the impact of ICT on financial management in Universities in Benue State.

*Table 6:* Summary of T-test Analysis on the perception of Federal and State University staff on the impact of ICT on financial management in Universities in Benue State.

S/N	Source	N	X	SD	df	Sig.	t-cal	t-value	Decision
1	Federal University	272	2.34	1.02					
					431	0.05	0.54	1.96	Not Significant
2	State University	161	2.32	0.88					

*Not Significant at df=431; P>0.05; t-calculated < t-tabulated*

The test of the hypothesis in Table 6 reveals that the calculated *t*-value of 0.54 given a 431 degree of freedom and 0.05 significance level 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 also retained. Thus, there is no significant difference in the mean ratings of staff in Federal and State Universities on the impact of ICT on financial management in Universities in Benue State.

#### IV. CONCLUSION

The task of managing the University system is enormous because of large data and information needs arising from students, staff and other management areas. The success of managing these institutions is dependent on the effectiveness of its management activities. ICT integration plays a vital role in supporting powerful and efficient management decisions,

which can improve or enhance the management tasks of Universities.

From the data collected, the level of ICT facilities available is low and with the low level of skills required to carry out their tasks using them, much needs to be done in terms of adequacy and quality, which will impact on the management of Universities in Benue State. Thus, Universities must be equipped with the latest technology to enhance their administrative tasks to bring about the desired output of the Universities in line with the mandate of their establishment. The study reveals that the management of Universities in Benue State can only be effective and efficient when its tasks and activities are automated by ICT facilities, which should be adequate in number and utilized properly.

## V RECOMMENDATIONS

1. The level of availability of ICT facilities in Universities in Benue State should be improved by procuring tools, providing good maintenance to the available ones, and replacing obsolete equipment.
2. Universities in Benue State need to boost the computer skills level of their staff to enhance productivity, effectiveness and efficiency.
3. The management of admissions in Universities in Benue State should be enhanced by the Universities' management through seamless integration of its processes with ICT by using web-based platforms and portals from the point of application, screening shortlisting, and issuance of admission letters, registration and matriculation.
4. For ICT to have a positive impact on the management of finance in Universities in Benue State, there is a need for the Universities' management to automate the accounting and financial management processes in the Universities.

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