

ICT and the Management of Higher Education Systems in Sokoto State, Nigeria: A Survey

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Abstract

This research sought to find out the adequacy, management activities, and challenges that affect the ICT facilities in higher education systems in Sokoto State. The study was quantitative and descriptive. Data was collected from a randomly selected sample of 354 students and lecturers from higher educational institutions in Sokoto state using a self-report questionnaire. The findings indicated that the ICT facilities were available in the institutions and, to some extent, adequate. It was also discovered that the institutions were using the ICT in planning administrative and academic programmes, communicating directives and other information to the staff and students, recruit students and keep vital records. However, it was found that the institutions face many challenges in using the ICT facilities such as unreliable electricity supply, poor maintenance attitude, insufficient personnel to man the ICT facilities, high cost of ICT equipment, lack of proper orientation, and inadequate funding. Based on the findings, it was recommended that educational institutions should regularly use ICT tools in organising and controlling academic and administrative activities. Also, the institutions should purchase standby generators for adequate electricity supply, employ trained personnel to monitor and take care of the ICT facilities, and actively source funding for ICT facilities.

Keywords: ICT, Management of Higher Education, Challenges, Sokoto State, Nigeria

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Introduction

The 21st Century witnesses a global paradigm shift from analogue to digital technologies, which impact on the way people and organisations behave (Krishnaveni & Meenakumari, 2010). Technology has modified the way peoples, groups and organisations operate (Gedwar, 2016). Technology simplifies challenging tasks, greatly improving efficiency in both people and organisations (Hood & Margets, 2007). Educational institutions need ICT to operate effectively and efficiently. Teachers and students need technology for effective teaching, learning and quality education. That is why Gedwar (2016) contends that ICT provides opportunities for improving the teaching and learning processes as it engenders advances in research and, learning, thereby bringing about rethinking the structure of education.

Adoption of ICT in educational management and administration is necessary and must be sustained in order to achieve efficiency and effectiveness in school management and administration (Hood & Margets, 2007). ICT facilitates decision making, knowledge management and data storage. Unlike the manual system by which educational managers and administrators perform manual labours to generate, store, recollect and utilise information (Krishnaveni & Meenakumari, 2010), ICT enables school managers and administrators to make their managerial and administrative functions in a more efficient, powerful and effective manner and enhances the school productivity and competitive advantage in the global market of education (Hood & Margets, 2007).

Developed nations in Europe and Asia such as the United States of America, United Kingdom, China, Japan, Turkey, Malaysia, Dubai and others have embraced technology in their universities in performing

their academic and administrative activities. Issues of teaching, learning, research, students' recruitment, staff recruitment, personnel training and development, results analysis and display, internationalisation of education, global education marketing, institutional security management, performance management, human resource management, as well as school plants management are all being done through ICT. That is why they developed far than other nations of the globe. However, the great misfortune is that many of the African countries are far behind this development in their education sector.

However, Nigerian educational institutions operate under daunting ICT deficits (Oboegbulen & Gowdin, 2013) despite the Federal Government's reiterated commitment towards the provision of ICT facilities to educational institutions. The situation may explain the absence of even a single Nigerian higher educational institution among the top 200 universities of the world in terms of the use of ICT in both the academic and administrative functions or operations of the universities (NUC, 2016). Thus, some Nigerian higher institutions perform their academic and managerial operations in a manual form (Oboegbulen & Godwin, 2013) in a time when other countries of the world had forgotten when last their educational institutions operated in such a manner. This is worrisome despite the availability of some ICT equipment in the institutions. Many institutions cannot recruit students online but use printed forms; some cannot publish students' results online but display it on notice boards; some cannot receive or make payments online but rather receive cash or through banks; some cannot publish books, journals, articles, and lecture notes online but instead use print copies. All these practices are due to their inability to integrate ICT in their operating procedures. Some lecturers and even professors



do not have the ability to use modern instructional technologies much less carry out research using ICT facilities.

However, the situation is gradually changing, though in a painfully slow manner. Higher education systems in Sokoto state have been able to receive some considerations from the state government in collaboration with NITDA in terms of the provision of ICT facilities in the institutions for enhancing teaching and learning processes in the schools (Omotewa, 2018). The tertiary institutions in the state boast of a lofty height attained in terms of the use of ICT in carrying out their academic activities. In Sokoto State University, for instance, a modern linguistic laboratory was introduced with a couple of computers and other voice recognition devices, and they are being utilised. In classrooms as well, interactive whiteboards and projectors were placed for conducting ICT based-learning, and that students and staff records are being kept with the use of ICT (Omotewa, 2018). Other higher institutions in the state like Umaru Shinkafi Polytechnic, Shehu Shagari College of Education are all connected with digital facilities for teaching and learning processes. However, the questions are: are there adequate ICT facilities in the higher institutions? Are the ICT facilities being used in the management and administration services of the institutions? Are there challenges that hinder the successful application of those facilities in the management of the institutions? This empirical investigation shall explore these questions.

Research Objectives

1. To assess the adequacy of ICT facilities in the higher institutions of Sokoto State
2. To determine whether the ICT facilities are being used in the management services of the institutions
3. To determine the challenges that hinder the successful application of the facilities in the management and administration of the institutions

Literature Review

ICT is an acronym of Information and Communication Technology. It includes a diverse set of technology and technological tools used to communicate, disseminate, store and manage information (Yusuf et al., 2013). According to Omotewa (2018), higher education institutions are places for high-level training manpower and for equipping the individuals to determine their level of performance of future roles. Higher institutions are perceived as places of enlightenment, exploring the frontiers of knowledge, in which people through the process of socialisation, 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 wellbeing (Adekigbe, 2005). Higher institutions are saddled with the responsibility of carrying out teaching, research, and knowledge dissemination functions (Bagudo, 1997).

Management of higher education involves the process of planning, organising, directing, staffing, coordinating, budgeting for, and reporting on higher education systems and activities (Omotewa, 2018). It is a process that is designed to ensure the cooperation, participation, intervention, and involvement for effective achievement of the goals of higher education institutions (Obi, 2003). It also involves the art of managing the resources of higher schools for effective service delivery. The resources can be human, material and financial resources. The human resources cover students, teachers, school heads, and supporting staff. The material resources involve the school plant, equipment and other instructional materials, while the financial resources covered the entire economic state of the institutions (Bashar, Sambo, et al., 2016).

The complex nature of higher institutions calls for full integration of ICT in their management and administration. This is to enhance effectiveness in their modus operandi in their managerial and administrative functions. Omotewa, (2018) observed that the enormous rise in the number of students in the institutions as well as the multiplicity of programmes have made higher institutions personnel to handle a vast quantity of data which must be accessed speedily in order to provide information for the schools' administration, mother

ministries and commissions, for effective management and decision-making processes

ICT and Educational Planning

According to Ololube (2007), ICT plays a vital role in the development of educational activities, part of which is educational planning. According to him, ICT enables successful and well-organised planning, helps in proper documentation of educational plans, serves as an easy avenue for developing, implementing and advancing educational policies, reforming the activities of the institution, helps education planners advance or improve the educational system. Similarly, ICT facilitates effective and quick decision making because of the availability of different information management systems that avail quick and accurate information needed in making decisions (Adeyemi & Olaleye, 2010). Accordingly, ICT if effectively used, helps in managing, utilising and allocation of resources and enhances effective communication and knowledge sharing among the administrators (Adeyemi & Olaleye, 2010). ICT speeds the educational planning process; therefore, ICT enhances the educational planning process (Omotewa, 2018). The institutional information systems hold the information on student, staff, resources, and so on, and this could be used by institutional administrators to plan and make decisions based on accurate and readily available facts. They budget the school expenditure and plans for the replacement of both obsolete and repairs of old equipment or institutional facilities (Adeyemi & Olaleye, 2010). School managers and administrators embrace ICT to enable them to plan, organise, control, direct, communicate and coordinate, effectively and efficiently, the affairs of their respective educational organisations. This is because when ICT facilities are provided and utilised, it reduces occupational stress which in turn leads to greater administrative efficiency and academic productivity (Oboegbulen, & Gowdin 2013).

ICT and the Organisation of Teaching and Learning Activities

The use of ICT in schools by staff and students have become a necessity as it can be used to improve the quality of teaching and to learn in any tertiary institution. The introduction of ICT in education paved the way for a new pedagogical approach, where students are expected to play a more active role than before (i.e. getting mere recipients of knowledge). Using the information and known ICT tools in education, students enable students to communicate, create preservatives in PowerPoint, and interact with colleagues and teachers using technology. According to Yusuf et al. (2013), as a result of ICT, culture and society, which are major factors of education, have adjusted to meet the challenges of the knowledge age. According to him, the prevalence and rapid development in ICT have transformed human society from the information age to the knowledge age. Therefore, the use of ICT in education by staff and students is becoming a necessity as it can be used to improve the quality of teaching and learning in any tertiary institution.

According to Omotewa (2018), ICT plays a major role in education and has an impact on the quality and quantity of teaching and learning as well as research in education. Internet as a digital tool of ICT has come to strengthen teaching and to learn as it provides powerful resources and services for students, thereby enabling them meet their educational needs, as it also allows networking among students and teachers to facilitate exchange of ideas and improve opportunities for connecting schools to the world (Oboegbulen, & Gowdin 2013). However, Ololube (2007) indicated the benefits of internet use in education, and also found positive and moderately high achievement at all educational level.

According to them, ICT as a field of education has been there in the form of teaching aids or apparatus thus, the current achievement in the field of ICT has offered tremendous opportunities for learning by electronic means, the use of e-learning and internet technology in learning. It is also seen as a means of improving the accessibility, efficiency and quality learning. Moreover,



the 21st century ICT has stretched educational boundaries and created new ones, some of which are internet, e-learning and m-learning.

ICT and Record Keeping

Abraham (2003) expressed that the usefulness of keeping school records with Information and Communication Technologies (ICT) is to ensure administrative efficiency, availability of information, and easy retrieval of information. With the introduction of ICT facilities such as computers, digital libraries, e-mail, internet and so on, information can be stored, disseminated, and records can be saved and retrieved whenever and wherever needed (Abraham, 2003). Based on this, Abraham (ibid), contended that ICT helps in maintaining adequate and accurate records in the education systems and make it available at ease. As for the retrieval, ICT leads to easy accessibility and dissemination of information of the school records, which be later accessed for perhaps planning, financial budgeting, effective implementation of the educational programs and policies. Hence, using ICT in keeping school records will help facilitate and enhance the administration of the school towards achieving the goals of the schools. That is why Maki (2008) buttressed that ICT plays a vital role in supporting powerful, efficient management and administration in the education sector.

In addition, Omotewa (2018) related that ICT could process voluminous records quickly, meticulously and impeccably; it can generate reliable and consistent records; helps in recording data and produce it quickly; and that ICT records save space that could be filled by voluminous files and documents in offices; and it saves human resources for data entry and servicing student admission and registration. With advanced scanning technology, completed application forms can be read into the databases in a matter of seconds. According to them, school managers can use ICT for scheduling courses, classroom time-tabling, inventory and personnel control, recording and reporting attendance, school accounting, storage and students' results management.

Methodology

The survey design was used. The study population of study participants include lecturers and students from three higher educational institutions in Sokoto state: namely, Sokoto State University, Shehu Shagari College of Education, and Umaru Ali Shinkafi Polytechnic Sokoto. A sample of 354 respondents was selected. The sample size was determined using the Krejcie and Morgan (1970) Table for sample size determination based on a population of 4,500. Data were collected using self-report survey called ICT and Management of Higher Education Questionnaire (ICTMHEQ).

Results

The data were analysed using descriptive statistics and were presented in frequency and percentage distributions based on the research questions.

RQ1: Are there adequate ICT facilities in the higher education institutions of Sokoto State? Participants' responses to this research question are recorded in Table 1:

Table 1: Responses on the adequacy of ICT facilities in the Higher Institutions

ICT facilities (e.g., computers, Internet access, projectors, CCTVs) in my institution are:			
Highly Adequate	Adequate	Inadequate	Highly Inadequate
10 (2.8%)	301 (85.2%)	39 (11%)	04 (1%)

Source: Field Survey (2019).

Table 1 displays participants' opinions on the adequacy of the ICT facilities in higher educational institutions in Sokoto State. The data from the table show that majority of the respondents ($n=301$, 85.2%) opined that ICT facilities in higher education institutions of the state are just adequate. This means that educational institutions in Sokoto

State possess enough ICT facilities adequate for their teaching and learning functions as well as other non-teaching services.

RQ2: Are the ICT facilities being used in the management functions of the institutions?

Table 2: ICT Facilities in the Management Functions of the Institutions

Item Statement	SA	A	D	SD
My institution always uses ICT in making general plans for its administrative and academic programmes.	101 (28.5%)	195 (55%)	40 (11%)	18 (5%)
My institution always uses ICT in organising all its academic and administrative activities.	19 (5.5%)	45 (12.7%)	190 (53.8%)	100 (28.2%)
My institution always uses ICT in communicating all its desired directives to all staff and students.	140 (39.5%)	144 (40.8%)	50 (14%)	20 (5.7%)
My institution always uses ICT in controlling all its administrative, curricular and non-curricular issues.	40 (11.3%)	30 (8.5%)	150 (42.3%)	134 (37.9%)
My institution always uses ICT in supervising and monitoring its activities and programmes.	35 (9.9%)	35 (9.9%)	180 (50.8%)	104 (29.4%)
My institution always uses ICT to make financial budgets and projects the sources of funding for its programmes	21 (5.9%)	10 (2.8%)	123 (34.7%)	200 (56.5%)
My institution always recruits students and keep their records using ICT.	220 (62.2%)	103 (29%)	10 (2.9%)	21 (5.9%)

Source: Field Survey (2019)

Key: SA = Strongly agree; A = Agree; D = Disagree; SD = Strongly disagree.

Table 2 shows participants' responses on the utilisation of ICT in the management of higher institutions in Sokoto State. The results indicate that majority of the institutions, in the opinion of the respondents (>80%), make use ICT facilities for planning administrative and academic programmes. However, it is curious to note that the same ICT facilities are seldom utilised in organising these activities which will have greatly ease the stress staff face in using manual procedures while organising their activities. Similar results were reported for lack of use of ICT in supervising and monitoring curricular and non-curricular activities. Also, it was found that a high proportion of Sokoto State educational institutions (>80%) do not use ICT facilities in managing financial records and transactions and critical administrative functions. Nevertheless, ICT in Sokoto educational institutions seems to be widely used for communication purposes (>80%) as well as for student recruitment and students' record keeping (>90%). The overall result paint of picture of ambivalent use of ICT in educational institutions where some tasks were carried using ICT and some that could easily be done using the same ICT infrastructure were not done.

RQ3: What are the challenges that the Institutions face in using the ICT facilities in delivering teaching and learning services?

Table 3 shows the responses of participants to this research question. The greatest challenge is that of electricity supply. ICT facilities are power-dependent and the epileptic supply of this vital resource from the National Grid greatly hampers the utilisation of ICT in Sokoto State educational institutions. Perhaps, this singular problem explains the institutions ambivalent use of ICT in their functions and processes. While this problem arise frm sources external to the institutions and therefore beyond their control, the other problems including mismanagement of available ICT resources, insufficient ICT personnel, and lack of training for lecturers on ICT use—are all avoidable problems. High cost of ICT facilities and poor funding with



regards to this compounds the problems of educational institutions making it difficult to take advantage of these facilities

Table 3: Challenges in the use of ICT facilities in the Institutions

Item Statement	SA	A	D	SD
Irregular electricity	210 (59.3%)	70 (19.7%)	52 (14.8%)	22 (6.2%)
Mismanagement of the available ICT resources in the institution	250 (70%)	80 (25%)	10 (2%)	14 (3%)
Insufficient personnel to monitor the available ICT facilities in the institution	170 (48%)	86 (24.2%)	60 (16.9%)	38 (10.72%)
The high cost of ICT equipment leads to underdevelopment of ICT in the institution	150 (42.37%)	150 (42.37%)	04 (1.12%)	50 (14.12%)
Lecturers are not frequently trained on new ICT innovations in the institution	180 (50.84%)	150 (42.37%)	19 (5.37%)	05 (1.4%)
Inadequate funding for maintenance of the facilities.	50 (14.12%)	260 (73.44%)	30 (8.47%)	14 (3.95%)

Source: Field Survey (2019)

Key: SA = Strongly agree; A = Agree; D = Disagree; SD = Strongly disagree.

Discussions

Firstly, the study found from the opinions of the majority of the respondents that the ICT facilities that are available in the institutions are just adequate but not highly adequate. This means that the institutions have to some extent, ICT facilities that could be used for conducting their teaching and learning functions as well as other non-teaching services.

Secondly, from the majority responses of the participants, it was discovered that the institutions always use ICT in three significant areas of management such as planning administrative and academic programmes, communicating directives and other vital information to the staff and students, and recruitment of students as well as record keeping. This effort of integrating ICT in the above managerial functions is important because Adeyemi and Olaleye (2010) argued that if ICT facilities are effectively used, it would definitely help in managing, utilising and allocation of resources and enhances effective communication and knowledge sharing among the administrators. Similarly, it would speed up the educational planning process (Olulobe, 2007). The institutional information systems hold the information on student, staff, resources, and so on, and this could be used by institutional administrators to plan and make decisions based on accurate and readily available facts. They budget the school expenditure and plans for the replacement of both obsolete and repairs of old equipment or institutional facilities (Oboegbulen, & Gowdin 2013). Furthermore, Oboegbulen and Gowdin (2013) suggested that school managers and administrators need to fully embrace ICT in order for them to be able to plan, organise, control, direct, communicate and coordinate, ineffective and efficient manner, the affairs of their respective educational organisations. This is because when ICT facilities are provided and utilised, they help reduce the occupational stress, which in turn leads to greater administrative efficiency and academic productivity.

Unfortunately, the study found that the institutions do not always use ICT in organising all their academic and administrative activities as they instead use their traditional manual hard works, they do not always use ICT in controlling administrative, curricular and non-curricular issues; do not use ICT in making financial budgets and projecting the sources of funding for their programmes — all these results to inefficiency and ineffectiveness in the services of the institutions.

Lastly, it was found that the challenges bedevilling the utilisation of those resources in the institutions are irregular electricity, poor maintenance attitude, insufficient personnel to man the ICT facilities,

high cost of ICT equipment leads to underdevelopment of the ICT facilities in the institutions, lecturers are not receiving frequent training on new ICT innovations, inadequate funding which also affects the provision and maintenance of the ICT facilities in the institutions. These findings are in line with the findings of Omotewa (2018) who found that lack of constant electricity supply among others affects the utilisation of ICT facilities in tertiary educational institutions of Sokoto State.

Conclusion

This research sought to find out the adequacy of ICT facilities, the management of institutions via ICT facilities and challenges that affect the use of the ICT facilities in higher education systems in Sokoto State. The study eventually found that the ICT facilities were available and to some extent, adequate but not highly adequate. Similarly, it was discovered that the institutions were using the ICT in planning administrative and academic programmes, communicating directives and other vital information to the staff and students, recruit students and keep vital records. However, it was found that the institutions face many challenges in using the ICT facilities such as unreliable electricity, poor maintenance attitude, insufficient personnel to man the ICT facilities, high cost of ICT equipment, lack of proper orientation, and inadequate funding.

Recommendations

Based on the findings of the study, the following solutions are hereby recommended:

1. The institutions need to be always using the ICT tools in organising all their academic and administrative to achieve effectiveness and efficiency in the management and academic activities of the institutions.
2. The institutions need to be using ICT facilities all the time to control the administrative, curricular and non-curricular issues of the institutions for ensuring effectiveness and efficiency.
3. The institutions need to be using the ICT in making their financial budgets and projections for the betterment of the institutions administratively and academically.
4. The institutions need to purchase standby generators for supplying the electricity in the case of unreliable electricity.
5. There is a need to provide more personnel who will be monitoring and taking care of the ICT facilities in the institutions.
6. There is the need for the institutions to be organising orientation sessions and programmes for the lecturers to equip them with the background knowledge of using the ICT equipment in conducting both the curricular and non-curriculum programmes of the institutions.
7. There is a need for more funding to the institutions so that they can provide maintenance services to the ICT facilities in the institutions.

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