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The extent of information and communication technology (ICT) infrastructure application in library and information science education in Nigeria

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The study sought to examine the extent of Information and Communication Technology (ICT) application in Library and Information Science (LIS) education in Nigeria. It looked at what formed the stumbling block to this ICT application. But first it x-rayed LIS courses in the undergraduate curricula of Library Schools that require ICT infrastructural application. Descriptive survey design was employed. Questionnaire was used to elicit data from the librarians. Other methods used to obtain data for the study include documentary evidence and checklist. Descriptive statistical techniques such as mean and standard deviation were used to analyse the data collated. Findings of this study revealed that dearth of ICT infrastructure affect its low application in teaching and learning. The LIS educators do not actually apply in their teaching the ICT infrastructure in the available ICT related courses because of large class size, erratic power supply, inadequate infrastructure etc. Hence this affects the LIS professionals because they come out not having enough ICT skill knowledge. This study recommends: increase in the number and acquisition of more different types of ICT training infrastructure, awareness creation on the importance of application of ICT infrastructure, standardization of the types and number of training facilities and ensuring their actual implementation in teaching and learning in library school programme in Nigeria by LIS professional bodies. It also recommends resource sharing to curb inadequacies of this infrastructure among others. This study concludes that when these are implemented library schools will not only compete favourably with other information related fields but live up to their expectations of producing librarians who will use the ICT tools to offer the type of services required and needed by information seekers in our contemporary society.

Key words: LIS education, ICT, ICT infrastructure, Nigeria.

INTRODUCTION

Developments in Information and Communication Technology (ICT) infrastructure have impacted all sectors of society and educational sector is no exception. ICT is identified as an indispensable instrument for the development of quality teaching and learning in the

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education system (Ololube, 2006).

The importance of ICT in Library and Information Science (LIS) education cannot be overemphasized. More so as some ICT related courses are now introduced in LIS education. Application of ICT infrastructure in LIS education will help librarians to offer effective and efficient library services that would be demanded by today's library patrons.

According to Ptak-Danchak (2012), library clientele are seeking a variety of social, collaborative spaces and quiet workspaces. They are ready to adopt new tools and innovative ways to communicate. They are ready to try any "e-book reader or i-product" that librarians would offer them.

Similarly, Kamila (2013) reported some of the services demanded of them to include: automated library services, computerized library services, e-library, digital, virtual and Internet library services. In other words, for librarians to thrive in their job they must be where their users are.

Ironically, some investigations made showed that some educational institutions in the developing countries suffer from limited or poor infrastructural facilities and as such could not use them in their activities more especially in the teaching and learning processes.

In Tanzania for instance, even though tutors in the Teachers Colleges (TC) have started applying ICT in teaching and learning but its application is still not efficient. The major reason being poor policy and project implementation strategies and poor information infrastructure towards ICT application in teaching and learning (Kisanjara et al., 2014).

In Ghana, a study conducted by Kumah and Tanye (2009) also reported that lecturers do not engage their students in the use of ICT for academic purposes. Email which was used by most students was only used for personal communication with friends and family members and not for academic purposes. In Kenya, the result of Rukwaro and Bii (2016) study revealed inadequate teaching staff, shortage of teaching material and infrastructure as challenges facing LIS education.

In Nigeria, Library and information science education which first started in Nigeria at University College Ibadan as a diploma programme followed by Ahmadu Bello University (ABU), Zaria as an undergraduate programme (Mohammed, 2008; Aina, 2007) and then to other parts of Nigeria has its own story to tell.

In the past, the course contents of LIS curriculum were traditionally based so also was the teaching and learning method. But due to emergence of technology in libraries Natarajan (2008) noticed a lot of changes. For instance, in the past, information previously comes mostly in print format but now most of them come in flash, CD-ROM, DVD etc. Also traditional reference services changes to online reference service, manual library catalogue change to OPAC service etc. All these changes are to meet the information needs of the patrons and employers of labour.

These changes according to Mbagwu (2015), has led many library schools into shifting to emerging technological courses. This has forced many library schools in Nigeria especially the universities based library schools in the South East into upgrading their respective curricula by infusing ICT contents into their courses outside the approved NUC curriculum for undergraduate library school programme in Nigeria.

For instance, from the documentary evidence as contained in the Department of Library and Information Science, Faculty of Education Prospectus, 2012 of Nnamdi Azikiwe University, Awka (n.d), Nnamdi Azikiwe University (NAU) Library and Information Science School introduced some of the following ICT related courses: Information systems and networking, Information literacy, Information network and library 2.0, Internet and electronic libraries etc. Also in a student handbook for library and information science programme, Abia State University, Uturu, Abia State (2010), Abia State University, Uturu (ABSU) LIS programme, introduced information systems and networking, Basic Computer operations, etc; Imo State University, Owerri (2016) in the (2012-2016) handbook for Faculty of Social Sciences Department of Library and Information Science, Imo State University, Owerri, introduced information systems and networking, information storage and retrieval and Online/Internet bibliographic information search among others. But ironically, the extent of application of ICT infrastructure in LIS education has not yet been determined.

A study conducted by Atsumbe et al. (2012) discovered that in Nigerian universities e-learning infrastructure are not adequate in the teaching and learning and management's efforts towards the development of ICT is mainly for administrative purposes.

In South East Nigeria, there are five public Universities running undergraduate programme in Library and Information Science. These Library Schools and their Universities include: Department of Library and Information Science, Abia State University Uturu (ABSU). Abia State University which was formerly called Imo State University was established in 1981. It is under the Faculty of Humanities and Social Sciences. It is now relocated to Uturu Okigwe in Abia State.

Department of Library and Information Science, University of Nigeria Nsukka (UNN) was established in 1983 under the Faculty of Education. UNN is a Federal University located at Nsukka in Enugu State. Department of Library and Information Science, Enugu State University of Science and Technology (ESUT) started their Library and Information Science programme in 1988. It is under the Faculty of Education. ESUT is located at Agbani also in Enugu State ((Enugu State University of Science and Technology, n.d). After the movement of the old Imo State University now Abia State University to Abia State, the new Imo State University, Owerri (IMSU) was established. Department of Library

and Information Science, Imo State University started in 1993/94 academic session, under the Faculty of Social Sciences but right now it is under the Faculty of Education. It is located at Owerri, the capital city of Imo State. The last but not the least is Nnamdi Azikiwe University Awka (NAU). NAU like UNN is a Federal University. Its Department of Library and Information Science started as a full-fledge and autonomous Department in 2005, under the Faculty of Education. These universities run LIS programmes at different levels – Diploma programmes, Bachelors, Post Graduate Diploma, Masters and at Doctoral levels respectively. However, it is only ESUT that does not run postgraduate programme.

The problem of underdevelopment of ICT infrastructure and its application in teaching and learning in Africa took its root from the lapses of the Association of African Universities (AAU) who according to Sife et al. (2007) should be in the forefront of ensuring African's participation in the ICT revolution, are themselves unable and ill-prepared to play such a leadership role. Hence their information infrastructure is poorly developed and inequitably distributed.

It is in the midst of all these that this study wants to examine the extent to which university based library schools in the South East, Nigeria apply ICT infrastructure in the education and training of librarians. Hence it is expected that the introduction of technological courses will also complement ICT infrastructure used in teaching and learning to avoid any mismatch. It also wants to find out what could be the possible challenges preventing the application of ICT infrastructure in LIS education in Nigeria.

Statement of the problem

Emergence of ICT has affected LIS education in all its entirety: in contents, method of teaching and learning, medium of instruction, training facilities and in some cases nomenclature of library school. How to marry all these affected areas with ICT mostly in developing country like Nigeria to conform to the realities of the modern time, pose a challenge.

For instance, some library and information science schools have upgraded their curriculum to accommodate some ICT related courses but lacked adequate ICT infrastructure to complement teaching and learning. In another development, some library and information science schools may have a considerable ICT infrastructure but lacked skill on how to apply them during teaching and learning. If these ICT infrastructures are not applied in LIS education it will result in the production of mediocre librarians who will not be able to provide effective services required by the library clientele in the global environment.

The importance of the application of ICT in the curriculum of LIS education notwithstanding, it is not clear the extent the library schools in Nigeria has applied ICT infrastructure in the teaching and learning in LIS education. It is based on this uncertainty that this study is intended to identify the extent of ICT infrastructure application in LIS education in Nigeria.

LITERATURE REVIEW

ICT infrastructure can be described as electronic device, equipment, or tool used for collection, processing, storage, retrieval or transfer of information, and its associated services (Egoeze et al., 2014).

Akinsola et al. (2005) categorized ICT infrastructure into hardware which comprised telephone, computer, LAN network, hub, printer, scanner, T.V, fax, codec camera, projector, radio, video CD, audio tape players and microphone and into software that includes windows, MS office and others. In essence ICT infrastructure all geared towards information processing, storage, retrieval and information transfer. Information professionals are the purveyors of information. There is great need therefore to incorporate ICT in their teaching and learning.

There are a lot of reasons why ICT infrastructure should be applied in the training of information professionals in this contemporary time. Some of them include meeting users' expectations; growth of information related occupations; embedding information literacy skill; influence of modern technologies among others.

Library users of today want librarians to shift from the traditional modelled type of offering library services to more modern ones using ICT and its associated technologies. Hence, Kamila (2013) stated that users of today expect libraries to deliver high quality comprehensive, user friendly new generation services. Since users are adopting electronic culture they require access to the latest information, updated information resources and access to ICT infrastructures that they could use in their work (Saleem et al., 2013).

This can only be possible with the use of ICT infrastructure. The dynamism of the society requires library to evolve and redesign their activities in order to deliver these services. The skills acquired will enable the practitioners to improve on their range of services to their clientele (Olorunsola, 2007). It also enable them serve their patrons better as most of the library services are now evolving around information technology (IT) as Fatima et al. (2012) opined.

Advancement in ICT and information explosion have resulted into the introduction of ICT related occupations. Hence, library schools neither have a monopoly over the education and training of information professionals nor have a monopoly over job opportunities in the emerging information markets (Bawden et al., 2005; Mancini,

2012).

This has resulted into competitiveness in the information market which the field of librarianship falls into. There is a great need therefore for library schools to redesign their curriculum to incorporate ICT courses as well as applying the necessary ICT infrastructural tools in their teaching and learning process. This will enable librarians acquire the necessary skills to be used to compete favourably with their counterpart in the information market. It will enable LIS professional according to Olurunsola (2007) to be more employable in today's job market. It will also enable them face stiff opposition (Ocholla and Bothma, 2007) from emerging information provision centers and services, particularly technology-driven services such as the Internet and wireless technology.

Information explosion is on the increase. Application of ICT infrastructure in the LIS education will enable librarians acquire skill that will enable them access materials scattered over the information super highway. With the ICT skill of librarians, libraries can according to Nyamboga (2004) access thousands of e-books, journals, databases and so on through ICT. He also recognizes the role library can play in information accessibility.

Thus, he advised that the universities should offer a credit or non-credit course on library use and information literacy in its curriculum through its library and information science or other departments. Implanting information literacy skill to librarians through their education helps solve worries of those who could not use the Internet efficiently. Hinson and Amidu (2006) noticed that the Internet as a research and learning tool was used by a few students and they rarely used Internet to locate information within the limited resources and services like e-mail and www. But through improved education of librarians, they will be able to train these type of users when performing their instructional duty.

Owing to increasingly change of library activities from traditional to modern technologies, there is need to introduce application of ICT into LIS education. This is a way of inculcating them to know their working tools. There are changes from manual to online practices, book or card catalogue to Online Public Access Catalogues (OPACs) and changes in the indexing and other information retrieval tools. These changes according to Chaudhary (2001) are forcing library and information scientists to adopt futuristic approaches. Hence, there should also be changes in the library education, changes in the curriculum and in the way teaching and learning takes place to accommodate the new modern technologies introduced in the library.

There are lot of challenges/barriers to the non-application of ICT infrastructure in teaching and learning. According to Hakkarainen et al. (2000) most of the computers instead of being in the classroom where teaching and learning takes place are housed in separate laboratories.

Philip et al. (2010) like Newhouse (2002) decried inadequate computer and non-existence of Internet facilities in many campuses. Where Internet is available they are plagued with low access speed, insufficient computer for users and poor power supply. Where multimedia projectors are available, interactive blackboard are lacking. Atsumbe et al. (2012) also discovered inadequate infrastructure for teaching and learning purposes instead management efforts towards development of ICT is mainly for administrative purposes.

There is problem of low level of awareness on the extent to which ICT could be useful in education. Thus, many lecturers according to Akomolafe (2009) were not conversant with ICT usage in classroom situation. Besides, Akinde and Adetimirin (2017) reported that low level of perception by the library educators on the usefulness of ICT for teaching affects the extent in which they apply ICT.

Also, a study conducted by Kumah and Tanye (2009) showed that even though most students have email addresses but the lecturers do not know how to engage students in the use of it for academic purposes. Al-Shboul et al. (2017) in another development reported that although students are familiar with basic ICT tools and ICT usage but they do not integrate them into their learning due to inadequate skill, inadequate trust on the reliability of ICT services, inadequate finance for acquisition and maintenance of ICT services by the students.

Inadequate provisions of financial and technical staff are another challenges preventing successful implementation of ICT infrastructure in education (Sife et al**.,** 2007; Tino, 2017). Hence, Tino (2017) suggested that stakeholders should consider the challenges of infrastructure, language and content, capacity building and financing before integrating ICT in education.

There is problem of implementation of basic ICT in education by several higher institutions as observed by Shahadat et al. (2012). For instance in Nigeria, the National Universities Commission (NUC), which is the government agency responsible for the regulation of universities prescribed PC ownership for universities as follows: one PC to every four students, one PC to every two lecturers below the lecturer 1, one PC per senior lecturer, and one notebook per reader/professor (Agyeman, 2007).

Many universities in Nigeria have not adhered to this. Except according to the study conducted by Atsumbe et al. (2012), Nnamdi Azikiwe University has met that of the lecturers but not that of the students' ratio.

Objectives of the study

The general purpose of this study is to examine the extent of ICT infrastructure application in library and

information science education in Nigeria. The specific objectives include:

(1) To identify ICT infrastructure used in LIS education in Nigeria.
(2) To determine the extent of application of ICT infrastructure in LIS education in Nigeria.
(3) To find out the challenges preventing application of ICT infrastructure in LIS education in Nigeria.

Research questions

(1) What ICT infrastructure are applied in LIS education in Nigeria?
(2) To what extent does ICT infrastructure applied in LIS education in Nigeria?
(3) What challenges prevent the application of ICT infrastructure in LIS education in Nigeria?

METHODOLOGY

Descriptive survey design was adopted for the study. The population was made up of all the lecturers/librarians drawn from the five universities offering library science at the undergraduate programme in South East Nigeria. The total number of lecturers/librarians in these universities is 138 that is, 47 library educators and 91 practicing librarians. The entire population was used because it was manageable.

The research instruments used were questionnaire, observation checklist, documentary evidence and oral interview. A total of one hundred and thirty eight copies of questionnaire were distributed with the help of five research assistants trained for this job by the researchers. The respondents were given few days to fill and return the completed questionnaire. Out of this number distributed, only 109 were duly filled and returned giving a response rate of (79%). The Schools were visited by the researchers to physically observe the existence of ICT infrastructure used in teaching and learning.

The numbers, types, nature, and space provided for the facilities were all noted. The brochures/handbooks of the Schools were also examined to note some of the ICT related courses while the Heads of the Departments of library schools were also interviewed personally by the researchers. The HODs were asked the following questions:

(1) What number of LIS undergraduate students were admitted in your institution this year?
(2) How many lecturers handle ICT related courses?
(3) To what extent does your LIS Department apply ICT infrastructure in the teaching and learning of ICT related courses?
(4) Do you have any challenge applying ICT infrastructure in teaching and learning (if “yes” then)
(5) What challenges do you have as regards application of ICT infrastructure?
(6) What recommendations do you have to give in this regard?

After the interview sessions, a report was produced for the analysis. The data collected from the questionnaire which was on a four-point rating scale of very great extent (VGE), great extent (GE), low extent (LE), not at all (NA) and strongly agree (SA), agree (A), disagree (D) and strongly disagree (SD) respectively were analyzed using descriptive statistical techniques such as mean (X) and standard deviation (SD.). The scale used was based on the cut-off point for the item mean and standard deviation in accordance with the Gregory and Ward (1978) formula for determining the lower and upper limits in mean. This formula was applied thus:

SA/VGE	3.50 - 4.00 points
A/GE	2.50 - 3.49 points
D/LE	1.50 - 2.49 points
SD/NA	0.5 - 1.49 points

RESULTS

Table 1 presents data on the type and number of ICT infrastructure applied in the library schools in Nigeria. Data obtained from items 1-16 from the spot check were presented in this table. The result of the observation checklist made revealed that all the five public Universities offering LIS undergraduate programme in S.E. Nigeria except ESUT owned one type of ICT infrastructure or another for teaching and learning in their various Departments.

Department of LIS, UNN has the highest number of different types of ICT infrastructure. It has eleven computers (9 desktops and 2 laptops) networked to the Internet, highest number of digital board and scanner. It also has printers, alternative power supply and so on. Above all it also involves in resource sharing. Second in hierarchy of ICT infrastructure ownership is IMSU Library School, which has nine different types of ICT infrastructure with only ten computers (2 desktops and 8 laptops), followed closely by NAU library school with seven computers and lastly ABSU with only two functional desktop computers.

Ironically, ABSU library school which ought to have had the highest number of computers in their LIS Department from the observation made has fifteen of its computers all faulty. The same applies to their photocopier. They dependent on their university generating set for their power supply.

Oral interview conducted showed student undergraduate population in these library schools in one of the academic sessions as follows ABSU (576), IMSU (540), UNN (214) and NAU (133) with ABSU having the highest number of student population. The HODs interviewed all have similar challenges hindering them from applying ICT infrastructure in their teaching and learning. Their major challenges include limited number of lecturers especially those handling ICT related courses; irregular power system; financial challenge of fuelling and maintaining their generating sets for those that have alternative power system, inadequate infrastructure, staff training; above all they lacked technical support staff among others.

Table 2 presents data on the extent by which ICT infrastructure are being applied in library school during teaching and learning. Responses to items 1 to15 of this research instrument depict their responses. The available

Table 1. Checklist on the identified ICT infrastructure applied in LIS Education in Nigeria.

S/N	Infrastructural facilities	ABSU		ESUT	IMSU	NAU	UNN
1	Desktop computers networked to the Internet Desktop computers	2 15	√ √x	***	2	7	9
2	Laptop networked to the Internet	X	-	-	8	X	2
3	Printers	X	-	-	3	X	1
4	Scanners	X	-	-	X	X	1
5	Computer projection devices	1	-	-	1	1	1
6	Digital camera	X	-	-	X	√	X
7	Digital board/White board	1	-	-	1	1	2
8	Copiers	√x	-	-	1	X	1
9	Internet and its technologies	√	-	-	√	√	√
10	E-resources (CD, DVD, flash drive etc)	√	-	-	√	√	√
11	Barcode reader, smart card	X	-	X	X	X	X
12	Online Public Access Catalogue	X	-	X	X	X	X
13	Use of productivity tools e.g. word processors, database	X	-	-	X	X	***
14	Local Area Network (LAN)	X	-	-	X	X	X
15	Connection to Public/Govt. power supply	X	-	-	-	-	-
16	Alternative Power supply	***	-	-	√	X	√

Key: Available= √; Available but not functioning= √ x; Not available= x; infrastructures shared= ***; Figure/Value= Number available.

Table 2. Mean analysis of data showing the extent of ICT infrastructure applied in LIS education in Nigeria.

S/N	Items	X	SD	Decision
1	Computer, connected to the Internet	2.65	0.79	GE
2	Standalone computer	2.35	0.84	LE
3	Laptop networked to the internet	2.20	0.99	LE
4	Printers and scanners	2.33	0.90	LE
5	Photocopiers	2.22	1.00	LE
6	Computer projection devices (multimedia/overhead projectors)	2.79	0.75	GE
7	Internet and its technologies (e-mail, www, computer conferencing etc.)	2.70	0.78	GE
8	Electronic resources (e-books, e-journals, full text database, ETD, CD-ROM, DVD, Flash etc.	2.68	0.88	GE
9	Books, monographs or serial publication in print that treated ICT topics	2.99	0.80	GE
10	Library software (automation, digital software etc.)	2.06	0.97	LE
11	Barcode reader	1.70	0.91	LE
12	Digital camera	2.00	0.82	LE
13	Digital board/white board	2.77	0.91	GE
14	Online Public Access Catalogue (OPAC)	1.96	1.04	LE
15	Use of productivity tools (for example, word processor, database etc.)	2.59	0.84	GE
-	Overall Mean and SD	2.40	0.53	LE

KEY: VGE= very great extent; GE= great extent; LE= low extent; Not at all.

data showed that on the whole there is low extent use (with mean rating of 2.40 (LE)) of ICT infrastructure during teaching and learning in library schools in Nigeria. However, the results revealed that the following infrastructures are used to a great extent: books, monographs or serial publication that treated ICT topics, computer projection device, digital board/white board among others. In another development, there is low extent use of barcode reader, scanners and printers during teaching and learning among others. Data obtained from oral interview and observation checklist showed that the practicability of students using them (hands-on) is not feasible because of their limited number especially the computers and the number of students

Table 3. Mean responses on the challenges preventing the application of ICT infrastructure in LIS education in Nigeria.

S/N	Items	X	SD	Decision
1	Inadequate qualified and competent staff	3.40	0.81	A
2	Poor teachers attitude towards ICT	2.62	0.91	A
3	Lack of confidence by the lecturers	2.42	0.96	D
4	Reluctance of teachers/students to adapt to the current trend in technology	2.72	0.82	A
5	Lack of motivation and incentive for librarians	3.03	0.74	A
6	Lack of training for staff	3.31	0.87	A
7	Non-provision of adequate training facilities for students (for example, laboratory) and for staff	3.36	0.79	A
8	Poor distribution of ICT infrastructure	3.43	0.69	A
9	Lack of access to Internet	2.86	0.85	A
10	Low Internet connectivity	3.14	0.84	A
11	Irregular supply of electricity	3.57	0.60	SA
12	Epileptic power supply	3.57	0.64	SA
13	Non-provision of alternative power supply	3.37	0.72	A
14	Inadequate accommodation for learning and for housing the facilities	2.87	0.89	A
15	Large class size	2.66	0.89	A
16	Towering cost of ICT infrastructure and Internet connectivity	3.23	0.76	A
17	Inadequate fund for staff training and purchase of the training facilities	3.46	0.63	A
18	No hands-on training was adopted	2.97	0.70	A
19	Inadequate time allocation for the practical	3.06	0.69	A
20	Lack of cooperation and support by administrators/library management	2.95	0.90	A
21	Absence of technicians to handle and maintain the ICT facilities	3.15	0.72	A
-	Overall Mean and SD	3.11	0.36	A

enrolled as well as poor power supply system. In other words, the HODs interviewed admitted that their lecturers only use them to demonstrate to students except the schools that depend on their university library's infrastructures.

Table 3 presents data on the challenges preventing the application of ICT infrastructure in LIS education in Nigeria. The respondents were asked to state their level of agreement or disagreement on how each of the twenty one items in this table affects the application of ICT infrastructure in their teaching and learning.

Almost all the respondents agreed that the items in this instrument contributed to the challenges preventing the application of ICT infrastructure. The results of the finding showed the major challenges as poor/irregular power supply, inadequate funding and qualified staff with the mean rating of 3.57, 3.46, 3.43, and 3.40 respectively. Others include absence of technicians and low internet among others. However, the respondents did not agree that poor attitude of teachers towards ICT could affect ICT infrastructure application during teaching and learning.

Data gathered during oral interview also showed these items as problems. According to the HODs of library schools interviewed, poor financing of library schools and poor/irregular supply of power constituted the greatest challenges. Data from the observation checklist made showed that the number of training ICT infrastructures available cannot commensurate with the number of students enrolled per session.

DISCUSSION

The findings of this study were discussed under the following headings.

Identification of ICT infrastructure applied in LIS education in Nigeria

ICT has continued to replace most of the manual library operations and services in the developed world thus making library services easier and quicker than hitherto. This gives librarians the opportunity to offer the state- of –the- arts services.

But in this study, the story is different, there is absence of barcode reader or scanner which reads or scans numbers of library resources. Again, modern library services and operations today require the use of one type of library software or the other. For instance, cataloguing and classification requires library management automation software for online processing of books but these were not downloaded/subscribed to by most library schools in this study.

The same applies to digitization software. The scanner which also helps in digitization could also not be found in most of the library school studied which implied that they are not used to teach the students. The schools that have them could still not use them to teach because of the number of students enrolled as envisaged from the result of interview conducted.

In the same way, other available numbers of ICT infrastructures identified in this study during on the spot check of training facilities are inadequate for teaching and learning. This affects the extent in which they are applied. This is in line with observation made by Hinson and Amidu (2006) where only few students used Internet to locate information within the limited resources and services like e-mail and www.

Unfortunately, the librarians who would have been in the better position to address this problem were themselves not trained with these ICT infrastructures. But through improved education of librarians, they will be able to train these type of users when performing their instructional duty. Hence the expected high quality and user friendly services as reported by Kamila (2014) are jeopardized.

Extent of the application of ICT infrastructure in LIS education in Nigeria

Characteristically and holistically, the extent of the application of the ICT infrastructure in teaching and learning in the undergraduate library school programme in Nigeria is very low. This is caused by the limited number of the training facilities available in the library schools as against the number of students enrolled per year. For instance, the result of this study revealed that in one of the academic sessions ABSU and IMSU library schools had a total of 576 and 540 students in their undergraduate programme competing with only two and ten functional computers respectively in their schools. Hence, the result of this study does not agree with the recommended ratio of one PC to every four students for research, learning/scholarship as reported by (Agyeman, 2007).

This study also revealed that lack of staff training or unawareness of the importance of ICT infrastructure in teaching and learning could also affect its low usage. Thus this study agrees with the work of Akomolafe (2009) who admitted that many lecturers are not conversant with ICT usage in classroom situation. It also agrees with study by Kumah and Tanye (2009) where lecturers do not know how to engage students in the use of ICT for academic purposes. Though the lecturers mentioned here may not be LIS educators but this is a general problem amongst teaching and learning in citadel of learning in Nigeria. Hence low extent usage of the following infrastructure: computers, printers and scanners, library software among others in teaching and learning is affected by their limited numbers and lack of knowledge on how to apply them for teaching and learning. This is not healthy as most of the library services and users demands are now tending towards IT.

Challenges preventing the application of ICT infrastructure in LIS education in Nigeria

The lack of or inefficient application of ICT infrastructures in LIS education in Nigeria as shown in this study is caused by inadequacies in the number, non-provision of different types of ICT and non-hands-on of the application of the facilities. All these are in line with the previous study conducted by Philip et al. (2010), Newhouse (2002) and Atsumbe et al. (2012) on inadequate computer, non-existence of Internet facilities and inadequate infrastructure in many campuses respectively.

The hallmark of the whole challenge is power. The result of this study agrees with Philip et al. (2010) and Newhouse (2002) on poor power supply which affects the use of Internet and the computers. Some library schools do not have independent alternative source of power supply. Hence, the extent of application of ICT infrastructure in teaching and learning is affected since power is the life wire of these infrastructures.

The space provided for ICT laboratories is too small to accommodate the students for practical hands-on use. They are housed in separate rooms away from the classroom. The result of this study is in line with Hakkarainen et al. (2000) discovery, though it suggested that the computers meant for training should stay in the classroom but the researchers disagreed with this for security reasons. For efficient and effective use of the computers in the laboratory, enough accommodation is to be provided, walk ways given for easy movement of both the lecturers and students during practical hands-on.

Another result revealed in this is that library schools in Nigeria lacked maintenance culture. The ICT training infrastructure should be serviced and upgraded from time to time but it is not so here. They lacked ICT technicians who are to do this work. The consequences of this neglect lead to the breakdown of most of these facilities as shown on the observations made, and this affect the usage.

The result of this study also revealed that lack of staff training, a product of unawareness, is another major reason why the ICT infrastructures are not used for

teaching and learning in library schools, because the LIS educators lacked the skill, they could not impart the knowledge to the students. Thus, this corroborates with earlier studies done by Akomolafe (2009), Kumah and Tanye (2009), and Akinde and Ademtirin (2017) who are not comfortable with the level by which lecturers integrate ICT in teaching and learning.

All these showed that application of ICT infrastructure in teaching and learning in library school cannot be done in isolation. The infrastructures must first be provided, training of staff on how to apply them follows. Technical staff must be handy. Then efforts must be made to ensure their actual implementation in teaching and learning by the lecturers. Any other challenge that could affect their use must be addressed. It is only by so doing that application of ICT infrastructural facilities will be realistic in LIS education in Nigeria.

Conclusion

The study has shown the indispensability of applying ICT infrastructures for teaching and training librarians. It is obvious in this study that the extent by which ICT infrastructures are applied in LIS undergraduate programme is very low in Nigeria. This is due mainly because of inadequacies in the number and non-existence of some ICT training infrastructures in some library schools, poor power supply, poor staff training and funding among others. In the contemporary information market, no profession enjoys a monopoly of the market. So in the field of librarianship to thrive in this market there is great need to address challenges preventing LIS education from progressing in its entirety. In so doing, library school will be able to live up to their expectation of producing librarians who will use the ICT tools to offer the type of services required and needed by information seekers in our contemporary society.

RECOMMENDATIONS

Based on the findings of this study, the following recommendations are proffered:

(1) Increasing acquisition in the number and more different types of ICT training infrastructure.
(2) The professional bodies such as Librarian Registration Council of Nigeria (LRCN) and Nigerian Library Association (NLA) should create awareness on the importance of training librarians using these modern ICT infrastructures and should also mandate all library schools not only to acquire them but to apply them during teaching and learning. Standard should also be set for the type and number of ICT training infrastructure required for every library school in Nigeria.
(3) The universities should make adequate provision of ICT training infrastructures not only in the library school but in the entire university. The library school management on their part should encourage collaboration with the other departments of the University for resource sharing especially in the area of ICT infrastructure and well trained faculty staff in ICT. This will help solve most of the challenges militating against none or inefficient application of the ICT infrastructure for teaching and learning.
(4) The life wire of ICT infrastructure is power. Library school management should ensure that they are not only connected to public/government but to have their own alternative power supply should one fails which often does.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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