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Article information:

To cite this document:

Ojedokun A Ayoku Victoria Nwamaka Okafor , (2015), "ICT skills acquisition and competencies of librarians", The Electronic Library, Vol. 33 Iss 3 pp. 502 - 523

Permanent link to this document:

<http://dx.doi.org/10.1108/EL-08-2013-0155>

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ICT skills acquisition and competencies of librarians

Implications for digital and electronic environment in Nigerian universities libraries

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Abstract

Purpose – The purpose of this paper is an audit of information technology (IT) skills set of librarians in some Nigerian university libraries with the aim of examining their relevance and adequacy to the digital environment. Nigerian universities as knowledge creators and their libraries as gatekeepers of knowledge are rapidly witnessing the introduction of various IT. One of the challenges facing IT/digital library projects in Nigeria has been the readiness of the university libraries in terms of knowledge and skills to implement the digital and electronic library services.

Design/methodology/approach – This paper used the survey approach. The sampling technique for the selection of the universities was stratified and for the librarians (respondents), census. The sampling frame was the approved list of universities released by the National Universities Commission as of the time of this study. The data were analysed using the Statistical Package for the Social Sciences.

Findings – The findings of this paper revealed that many of the respondents do have knowledge and skills of email use and word processing tasks but lack knowledge of search engines and directories other than Google and Yahoo, respectively. Many of them do not know how to evaluate and catalogue e-resources; have no knowledge of subject gateways, specialised databases and some open-access library databases; have no knowledge of database management; are not skilled in Web design; and are equally not familiar with Web design applications.

Originality/value – The study recommends management support for IT skills training and/or continuous professional development to improve the librarians. Librarians are also challenged and encouraged to explore the range of training resources available over the Internet for self-development.

Keywords Digital libraries, Information management, Academic libraries, Competences, Electronic resources, Computer networks

Paper type Research paper

Introduction

Traditionally, academic libraries have served and performed their duties of collection development, user instruction, reference services and current awareness services using physical materials to provide information to their users. However, with the advent of information and communication technology (ICT), libraries and librarians need to be aware of and understand this new dimension to their services. Today, people use the Internet as a primary source of information, often relying on books as a last resort due to issues of time and money. In terms of infrastructure, libraries now devote much space to public computer facilities, and librarians undergo additional training to be well-



equipped to deal with queries related to modern research techniques and online resources, as well as the traditional questions relating to finding and borrowing books. Library archives and records are also now computerised, leading to a more efficient and effective borrowing and returns system, and a faster method of locating resources and assessing the availability of items.

In terms of administration, running a library is now perceived as being much simpler than before, thanks to the aid of computerised systems. Modern systems are also beneficial to customers who are able to reserve and renew items online, as well as being able to explore an extensive library catalogue online. The new system of computerised records reduces using a large amount of paper, which, on a national scale, could contribute significantly to helping the environment, thus providing a positive ecological impact (South West Museums and Libraries Association Champion, 2009). Aina (2004) also alluded to the impact of ICT on libraries, which, according to the author, has radically transformed most of the services provided by a library. Technology is now heavily utilised in the storage, processing and dissemination of information, and has made the organisation of information very efficient, the delivery of basic information services more effective and the dissemination of information to users easier. The automation of library processes has eliminated a number of routine and repetitive tasks.

Many libraries are online or in the process of getting online. Palmer *et al.* (2008) emphasised that libraries are moving beyond a custodial role to the management of various kinds of digital content. Libraries in Nigeria are increasingly gaining the status of an electronic library – meaning a library consisting of electronic materials and services, which can include all types of digital materials, as well as a variety of analogue formats requiring electricity to use, such as video tapes (Ojedokun and Moahi, 2007). The pressure to go electronic has never been more apparent than in this era of globalisation. Nigerian universities and their libraries, in their roles as knowledge creators and gatekeepers of knowledge, are rapidly witnessing the introduction of various information technologies (IT). Some libraries have implemented integrated library systems (ILS), built digital collections, developed institutional repositories (IRs) and provided electronic services, such as access to the Internet, e-journals, email and workstations for general computing, including word processing, spreadsheets, data analysis and a host of other computer-based applications. In other words, libraries are now putting more emphasis on electronic and digital information resources.

The key trends driving education technology, as identified in the 2012 Horizon Report of the ACRL Research Planning and Review Committee (2012), are equally applicable to academic libraries in terms of user desire for access to information and social media, and network anytime/anywhere, acceptance and adoption of cloud-based technologies, more value placed on collaboration and new education paradigms which include online and hybrid learning with a new emphasis on challenge-based and active learning. Additionally, librarians are often required to collaborate with the faculty to teach information literacy skills for students (Reyes, 2006). Thus, specialised job responsibilities are emerging to handle new position demands and new opportunities. These developments call for new skills and knowledge acquisition relevant to the IT environment by librarians. For example, the development of a digital collection or an IR requires the traditional skills of collection development, as well as the newer skills of server setup and maintenance, while developing and managing a website may require knowledge of programming languages, such as JavaScript and Perl, and networking

concepts, such as IP addresses and server operating systems. The objective of this study is, therefore, to audit the ICT competency skills of librarians, the relevance of such skills and their knowledge regarding the implementation of digital and electronic library services. Tyson (2007) substantiated the objectives of this paper when he suggested that a skills audit of librarians can be a solution to addressing twenty-first-century library issues.

Objectives of the study

To ascertain the extent of ICT skills acquired by librarians in terms of use of email, word processing, Internet and database searching, database management, Web design and familiarity with Web directory, and common library databases. The specific objectives are:

- To find reasons why some librarians have not acquired some of the necessary ICT skills.
- To ascertain from librarians the effect of non-acquisition of those skills in information delivery in university libraries.
- To find out how strategies that librarians think of can be employed to improve the acquisition of those ICT skills by others.

Literature review

To meet the demand of online clients, libraries must be equipped with the required technology and human expertise (Batool and Ameen, 2010). This suggests that the skills of librarians should match the technological infrastructure. APLEN (2008) defined technological core competencies for library professionals to be a combination of skills, knowledge and behaviours related to library technologies and noted that these are important for the success of the organisation, as well as personal performance and career building. Feret and Marcinek, as cited in East (2007), wrote that a survey of an international group of senior academic librarians indeed revealed that, with regard to skills of future academic librarians, technology and communication skills remain the most desired. Malinconico (1989) concluded that librarians need to understand how to manage technology and how to harness it for their own ends. Beile and Adams, cited in Mathews and Pardue (2009), performed a content analysis of library position announcements and reported that as libraries increase their use of electronic information sources, there is a corresponding increase in requiring librarians to have a higher degree of computer skills. Zhou, also cited in Mathews and Pardue (2009), provided an in-depth analysis of computer skills for academic librarians and offered a list of required computer skills. He listed that experience with bibliographic utilities such as OCLC or RLN, automated library systems (including general knowledge of library automation), online database searching, microcomputer applications, mainframe computer applications, CD-ROM products, computer languages or programming, computer hardware, networks such as LAN or WAN, Internet searching, resources in electronic formats and image technology or multimedia are important skills. In addition, Okojie, cited in Anunobi and Ukwoma (2009), included information literacy skills, Internet search skills, fund raising, advocacy, marketing and management skills, electronic information services, virtual libraries and intellectual property/copyright laws as vital knowledge for librarians.

Studies by Babu *et al.* (2007), Mathews and Pardue (2009) and Batool and Ameen (2010), among others, have further identified IT skill sets for librarians. For example, Mathews and Pardue (2009) examined the IT skills employers deemed essential for librarians to include Web development, project management, systems development and systems applications. Other specific IT skill sets are as indicated: programming languages (such as Visual Basic, Java, C#, C, C++, SQL), networking (LAN administration, network design, network security and network management), Web development (HTML/XML, FrontPage, Dreamweaver, authoring web pages, maintaining websites, Web 2.0 functions), project management (managing IT projects, production scheduling and supervising personnel), systems development (systems design and analysis, object modelling/UML, CASE tools, database creation) and systems applications (installation of software, upgrading software, maintenance, installation and troubleshooting of hardware, performing systems maintenance and backups).

While Mathews and Pardue (2009) based their investigation on job content analysis, Babu *et al.* (2007) and Batool and Ameen (2010) studied librarians on the job. Babu *et al.* (2007) investigated the level of ICT skills among librarians in engineering educational institutions in Tamil Nadu, India. The study focused on skills related to operating systems, software packages, programming languages, library automation software, Web awareness and online facilities/services, in addition to technical skills and managerial skills. Their study revealed that the majority of library professionals were conversant with DOS and Windows, while only a few possessed skills in UNIX and LINUX. The professionals possessed skills in eight software packages and programming languages, but with varying levels of skill. Respondents had fair knowledge of library automation software, were aware of OPAC/Web OPAC and CD-ROM searching and had skills with email, Internet surfing and search engine use. In terms of technical skills, respondents indicated knowledge of creating a catalogue and metadata, optical character recognition, user interface design and image technology. Approximately 55 per cent had a fair knowledge of all managerial skills.

Batool and Ameen (2010) investigated the type and level of technological skills possessed by university librarians in the following categories: computer hardware – expertise includes awareness about the physical parts, their installation, troubleshooting and replacing; word processing – including proficiency in formatting, inserting and applying different styles to documents; Internet – expertise meaning one has knowledge of how to log on, enter Web addresses, utilise different search engines, apply basic Internet terminology and emailing functions; troubleshoot – expertise enables a person to identify “why my keyboard is not responding” and other basic questions; and ILS – expertise used to track items owned, orders made, bills paid and patrons who have borrowed. These also usually consist of a relational database, software to act on that database and two graphical user interfaces (one for patrons, one for staff). The findings demonstrate that though all these skills are considered essential by employers, respondents only selected proficiency in computer hardware and word processing. This review established the importance of IT skills in providing effective and efficient library and information services. Therefore, librarians need IT skills to implement digital and electronic library services.

Sampath Kumar and Birada (2010) examined the use of ICT in 31 college libraries in Karnataka, India, using questionnaires, observation and informal interviews with

selected college librarians. The study discovered that the application of ICT in Indian college libraries had not reached a very high level. The study also discovered that the main constraints for not automating library activities were lack of budget, manpower, skilled staff and training opportunities. In a more recent study, [Kaltimani and Naik \(2013\)](#) evaluated the competence in librarianship and ICT skills between different designations of library professionals, who worked in the engineering college libraries affiliated with Visvesvaraya Technological University (VTU), in Belgaum, Karnataka, India. The study used a combined methodology of questionnaire, observation and interaction with library and information professionals. Results revealed a significant difference between the different designations towards competence in the operation of computers, creation of files and folders, radio frequency identification, library automation software modules, Internet-related skills, Web design/Web editing, search engines and digitisation of IR materials. The study further revealed that the majority of the professionals are facing financial problems, work overload and negative attitudes from their administrators in acquiring ICT skills.

Methodology

The study used the descriptive survey approach with a self-constructed questionnaire and interview for data collection. The questionnaire included questions on digital library skills and knowledge of ICT competencies required of librarians. There were two sections of the questionnaire. Section A was on demographic information of the respondents, name of their university, rank, qualifications and length of services, while Section B examined the skills and knowledge of ICT competencies of the respondents. Section B had 7 sub-sections and 114 questions which included use of email, word processing, Internet and database searching, evaluation of e-resources, database management and Web design. The questionnaire was given to three senior colleagues who are experts in ICT to proof the questions and to make necessary comments on the validity of the instrument for the study. Their comments were implemented before the questionnaire was pilot-tested on a branch library of the University of Nigeria, Nsukka. The reliability of the questionnaire items had a Cronbach alpha coefficient of 0.71. Respondents were from federal, state and private universities in the three geopolitical zones in Southern Nigeria – South East, South South and South West. The sample of universities was determined by stratified sampling using the approved list of universities recently released by the National Universities Commission at the time of this research.

One librarian from each of the ten university libraries selected was interviewed by the researcher. Interviews were conducted to examine their opinions regarding the lack of ICT skills acquisition by some, the effect of non-acquisition of those skills on information delivery in the digital library and suggestions of strategies which can be used to improve the acquisition of those ICT skills. The interview process was face-to-face for the respondents whom the researchers could reach easily and via telephone calls with librarians from universities which were further away. The comments of the respondents were compiled and summarised as presented in the result section. The respondents cut across a variety of different ranks, years of experience and qualifications, as acquisition of ICT skills is important for all librarians.

The selected libraries from the zones indicating the number of questionnaires administered and returned, respectively, were: Obafemi Awolowo University, Ife (13, 8);

University of Ibadan, Ibadan (15, 8); Osun State University, Osogbo (7, 4); Bowen University, Iwo (6, 6); University of Nigeria, Nsukka (40, 28); Nnamdi Azikiwe University, Awka (8, 4); University of Calabar, Calabar (10, 6); Bishop Okoye University, Enugu (2, 2); Caritas University, Enugu (2, 2); and Madonna University, Elele (12, 8). Of the 114 questionnaires distributed, 76 usable questionnaires were returned, which provided a 66.1 per cent response rate. Of the 76 respondents, 36 (47.4 per cent) were from the South East, 26 (34.2 per cent) from the South West and 14 (18.4 per cent) from the South South. The Statistical Package for the Social Sciences (SPSS) was used for data analysis. The results were expressed as frequencies and percentages.

Presentation of results

Twelve (15.8 per cent) of the respondents have either a bachelor's degree in library studies or library science, 55 (72.4 per cent) have either a master's degree in library science or information science, 7 (9.2 per cent) have a Doctor of Philosophy (PhD) degree, 1 (1.3 per cent) has a Master of Philosophy (MPhil) degree and 1 (1.3 per cent) has a National Diploma (ND) in library science. Of the 75 respondents who answered the question on years of librarianship practice, 33 (44 per cent) have spent 1-5 years in practice, 10 (13.3 per cent) have spent 6-10 years, 10 (13.3 per cent) have spent 11-15 years, 14 (18.7 per cent) have spent 16-20 years, 3 (4 per cent) have spent 26-30 years and 5 (6.7 per cent) have spent over 30 years.

Use of email

The study revealed that, although the majority of the respondents (to a large or very large extent) are able to create and compose emails, forward and reply to an email and attach files to emails, only a few are able to set up signatures or holiday/vacation notes, filter, create folders, block an address, customise email, spam emails and tag a message (Tables I and II).

Word processing

The study findings show that more than half of the respondents (to a large or very large extent) can perform word processing tasks and have knowledge of: "how to save documents", "difference between save and save as", "saving documents in different version of word processor", "setting margins and orientation", "how to print document", "working with tables", "how to mail-merge", "how to password protect a document", "how to use grammar and spelling tool" and "how to use thesaurus". What is surprising is that there are two or three respondents who cannot perform any of these word processing tasks. It was also found that 21 (28.8 per cent) do not know how to password-protect a document (Tables III and IV).

Formatting operations in word processing

The study findings with regards to formatting operations in word processing revealed that many of our respondents can perform the following formatting operations: "set bold" (61, 80.3 per cent), do "underline" (61, 80.3 per cent), do "line-spacing" (63, 82.9 per cent), set "page number" (49, 64.5 per cent), "insert image" (45, 59.2 per cent), set "alignment" (43, 56.6 per cent), do "columns" (42, 55.3 per cent) and do "headers & footers" (39, 51.3 per cent). However, only a few can "hang paragraphs" (32, 42.1 per cent), do "bookmark" (28, 36.8 per cent), do "referencing" (24, 32 per cent), do "footnote

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Table I.
Use of email

Extent	Email creation		Compose and send		Attach doc		Forward reply		Set signature		Set holiday/vacation rules	
	No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)
Very large	39	54.9	49	65.3	41	53.9	44	58.7	16	22.2	13	17.1
Large	23	32.4	16	21.3	17	22.4	24	32.0	12	16.7	14	18.4
Small	7	9.9	9	12.0	13	17.1	6	8.0	29	40.3	21	27.6
Not at all	2	2.8	1	1.3	5	6.6	1	1.3	15	20.8	28	36.8
Total	71		75		76		75		72		76	

and pagenote" (23, 30.3 per cent), do "drop-cap" (22, 28.9 per cent) and do "watermark" (14, 18.4 per cent) (Table V).

Internet and database searching

Regarding Internet and database searching, the study found that many of the respondents know how to formulate search queries (65, 87.7 per cent). It was also revealed that 51 (76.1 per cent) of the respondents know how to refine searches. Only 37 (59.7 per cent) of the 62 respondents could use search features of different search engines. Surprisingly, only 36 (83.7 per cent) of the 43 professionals who answered the question could evaluate resources retrieved from the Internet and other online sources (Table VI).

What is also surprising is that many of the respondents do not know any search engines other than "Google" (73, 96.1 per cent). Only a few have knowledge of other search engines such as "alltheweb", "Altavista", "Hotbot" and "Excite" (Table VII). Two respondents indicated knowledge of "Dogpile". In some of the responses, it was also discovered that some respondents were not aware of the difference between a "search engine" and a "Web directory". This is, however, not too surprising, as some Web directories also include search engines in their page. A few participants could not differentiate between a "search engine", a "portal" and a "Web browser", as they indicated Mozilla Firefox and MSN (a Microsoft portal) as search engines.

Similarly, many of the respondents also do not know any "Web directories" other than "Yahoo" (66, 86.8 per cent). Only a few are familiar with the "Librarians' Index to the Internet" (22, 28.9 per cent), "Britannica" (22, 28.9 per cent), "About.com" (21, 27.6 per cent), "Go Directory" (18, 23.7 per cent), "Open Directory" (14, 18.4 per cent), "LookSmart" (8, 10.5 per cent) and "BUBL link" (7, 9.2 per cent) (Table VII).

The study also found that only a few respondents are familiar with "subject gateways". Thirty-eight (50 per cent) of the respondents are familiar with the "WWW Virtual Library", 29 (38.2 per cent) of the respondents are familiar with "academic information" and 20 (26.3 per cent) of the respondents are familiar with the "LivingWeb Virtual Library" and "Infomine", while only three of the respondents are familiar with "PINNAKES" (Table VIII).

Many of the respondents are unfamiliar with specialised databases. Only 27 (35.5 per cent) are familiar with "ERIC Clearinghouse" – a specialised database for education, 4 (5.3 per cent) with Voice of Shuttle – a humanities research database, 6 (7.9 per cent) with "Expedia" (travel) and 14 (18.4 per cent) with "News Directory". Although 3 (18.8 per cent) of the respondents indicated familiarity with specialised databases other than those mentioned, they did not provide their names (Table IX).

Extent	Set filters		Create folders		Block an address		Customise email		Spam email		Tag/flag email	
	No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)
Very large	15	20.5	21	27.6	14	18.7	12	16.4	11	15.3	14	18.7
Large	9	12.3	16	21.1	14	18.7	10	13.7	12	16.7	7	9.3
Small	24	32.9	32	42.1	23	30.7	27	37.0	23	31.9	27	36.0
Not at all	25	34.3	7	9.2	24	32.0	24	32.9	26	36.1	27	36.0
Total	73		76		75		73		72		75	

Table II.
Use of advanced email options

Table III.
Word processing
tasks

Extent	Performance of word processing tasks		Knowledge of how to save documents		Knowledge of difference between "save" and "save as"		Knowledge of saving document in different versions of word		Knowledge of setting margins and orientation		Knowledge of how to print document	
	No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)
Very large	34	45.9	48	64.0	46	62.2	34	45.9	32	42.7	45	60.8
Large	29	39.2	19	25.3	19	25.7	19	25.7	12	16.0	17	23.0
Small	9	12.2	7	9.3	6	8.1	17	23.0	28	37.3	11	14.9
Not at all	2	2.7	1.3	1.3	3	4.1	4	5.4	3	4.0	1	1.3
Total	74		75		74		74		75		74	

Extent	Knowledge of working with tables		Knowledge of how to mail-merge		Knowledge of how to password-protect a document		Knowledge of how to use “grammar and spelling” tool		Knowledge of how to use thesaurus	
	No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)
Very large	26	34.7	21	28.0	20	27.4	28	37.3	24	32.0
Large	20	26.7	18	24.0	15	20.5	29	38.7	21	28.0
Small	26	34.6	25	33.3	17	23.3	15	20.0	23	30.7
Not at all	3	4.0	11	14.7	21	28.8	3	4.0	7	9.3
Total	75		75		73		75		75	

Table IV.
Word processing tasks

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Table V.
Formatting
operations in word
processing

Operations in word processing	Yes	(%)	No	(%)
Set "bold" T = 75	61	80.3	14	19.7
"line spacing" T = 76	63	82.9	13	17.1
Do "bookmark" T = 76	28	36.8	48	63.2
Set "page number" T = 76	49	64.5	27	35.5
"insert image" T = 76	45	59.2	31	40.8
"italics" T = 76	61	80.3	15	19.7
"alignment" T = 76	43	56.6	33	43.4
Do "watermark" T = 76	14	18.4	62	81.6
"referencing" T = 75	24	32.0	51	68.0
"drop-cap" T = 76	22	28.9	54	71.1
"underline" T = 76	64	84.2	12	15.8
"hang paragraph" T = 76	32	42.1	44	57.9
"headers & footers" T = 76	39	51.3	37	48.7
"footnote & pagenote" T = 76	23	30.3	53	69.7
Do "columns" T = 76	42	55.3	34	44.7

Table VI.
Internet search skills

How to:	Yes	(%)	No	(%)
Formulate search query (T = 74)	65	87.7	9	12.2
Evaluate resources retrieved from the Internet and other online sources (T = 43)	36	83.7	7	16.3
Use search features of different search engines (T = 62)	37	59.7	25	40.3
Refine search during search operations (T = 67)	51	76.1	16	23.9

Table VII.
Familiarity with Web
directories

Web directories	Yes	(%)	No	(%)
About.com T = 76	21	27.6	55	72.4
Librarians' Index to the Internet T = 76	22	28.9	54	71.1
Open Directory (T = 76)	14	18.4	62	81.6
Yahoo T = 76	66	86.8	10	13.2
BUBL Link T = 76	7	9.2	69	90.8
Britannica (T = 76)	22	28.9	54	71.1
Go Directory T = 76	18	23.7	58	76.3
LookSmart T = 76	8	10.5	68	89.5
Other Directories T = 16	2	12.5	14	87.5

The study also found that many of the respondents are also not familiar with library databases providing open access to journal articles. The findings, however, revealed familiarity of over 50 per cent of the respondents with "Agora" (55, 72.4 per cent), "Google Scholar" (52, 68.4 per cent), "OARE" (49, 64.5 per cent), "JSTOR" (49, 64.5 per cent), "HINARI" (46, 60.5 per cent), "EBSCOhost" (45, 59.2 per cent), "African Journal Online" (45, 59.2 per cent) and "National Virtual Library" (43, 56.6 per cent) (Table X).

The findings of the study reveal that not many of the respondents know how to catalogue electronic resources. Only 32 (42.7 per cent) of the respondents know how to catalogue DVDs, CDs and VCDs; 24 (32 per cent) know how to catalogue video tapes; 27

(36 per cent) of the respondents know how to catalogue audio tapes; and 13 (17.3 per cent) of the respondents know how to catalogue microforms (Table XI).

Database management

Database management is the skill required in the creation and maintenance of a database. The findings of the study equally revealed that many of the respondents are not familiar with database management. Few (to a large or very large extent) have knowledge of database management (Tables XII and XIII).

Web design

Web design is the skill of creating presentations of content (usually hypertext or hypermedia) which are delivered to an end-user through the World Wide Web, by way of a Web browser. The study revealed that many of the respondents have no knowledge of Web design. Few (to a large or very large extent) know something about Web design (Tables XIV and XV).

The study further revealed that only a few (to a large or very large extent) know how to use the following Web design applications: FrontPage (14, 18.4 per cent), Dreamweaver (14, 18.4 per cent), NotePage (10, 13.2 per cent) and Komodo (1, 1.3 per cent), as shown in Table XVI.

Interviews with respondents elicited several reasons for why some librarians have not acquired the required ICT skills as follows:

- lack of interest in IT skills acquisition (conservation);
- technophobia (fear);
- non-charlatan attitude on the part of some librarians towards acquisition of these skills;

Gateways	Yes	(%)	No	(%)
Academic information T = 76	29	38.2	47	61.8
PINNAKES T = 76	3	3.9	73	96.1
WWW Virtual Library T = 76	38	50.0	38	50.0
Internet Public Library T = 76	20	26.3	56	73.7
My Virtual Reference Desk T = 76	20	26.3	56	73.7
Other Library gateways T = 14	1	7.1	13	92.9
LivingWeb Virtual Library T = 76	5	6.6	71	93.4
Infomine T = 76	11	14.5	65	85.5

Table VIII.
Familiarity with gateways

Specialised databases	Yes	(%)	No	(%)
ERIC Clearinghouse T = 76	27	35.5	49	64.5
Voice of Shuttle T = 76	4	5.3	72	94.7
News Directory T = 76	14	18.4	62	81.6
Other specialised databases T = 16	3	18.8	13	81.2
WebMed T = 76	18	23.7	58	76.3
Expedia Travel T = 76	6	7.9	70	92.1
Jumbo Software T = 76	7	9.2	69	90.8

Table IX.
Familiarity with "specialised databases"

EL
33,3

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Library databases	Yes	(%)	No	(%)
Agora T = 76	55	72.4	21	27.6
Data – World Bank T = 76	10	13.2	66	86.8
National Virtual Library T = 76	43	56.6	33	43.4
HealthMap T = 76	3	3.9	73	96.1
BMJ Journal T = 76	23	30.3	53	69.7
Research Papers in Economics T = 76	9	11.8	67	88.2
Web of Science T = 76	15	19.7	61	80.3
Highwire Archive T = 76	9	11.8	67	88.2
Social Science Library (SSL) (T = 76)	11	14.7	64	85.3
JSTOR T = 76	49	64.5	27	35.5
UN Data T = 76	8	10.5	68	89.5
African Journal Online T = 76	45	59.2	31	40.8
HINARI T = 76	46	60.5	30	39.5
PubMed Central T = 76	18	23.7	58	76.3
MathSci Net T = 76	11	14.5	65	85.5
OARE T = 76	49	64.5	27	35.5
OER Africa T = 75	3	4.0	72	96.0
Other databases T = 76	3	18.8	13	81.2
Google Scholar T = 76	52	68.4	24	31.6
ALUKA T = 76	14	18.4	62	81.6
National Library of Medicine T = 76	18	23.7	58	76.3
Biomed Central T = 76	19	25.0	57	75.0
POPLINE T = 76	13	17.1	63	82.9
EBSCO host T = 76	45	59.2	31	40.8
DOJA T = 76	32	42.1	44	57.9
TEEAL T = 75	12	16.0	63	84.0

Table X.
Familiarity with
common library
databases

Ability to catalogue	Yes	(%)	No	(%)
DVDs, CDs and VCDs T = 75	32	42.7	43	57.3
Microform T = 75	13	17.3	62	82.7
Video tapes T = 75	24	32	51	68
Others T = 73	17	23.3	56	76.7
Audio tapes T = 75	27	36.0	48	64

Table XI.
Ability to catalogue
media

Extent	Difference between RD and FFD		Familiarity with SQL statement		Able to query a database		Able to store information in a database		Able to create a database form	
	No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)
Very large	3	4.5	6	8.8	10	14.9	15	21.1	12	17.4
Large	16	23.9	10	14.7	12	17.9	17	23.9	16	23.2
Small	23	34.3	28	41.2	23	34.3	27	38.0	25	36.2
Not at all	25	37.3	24	35.3	22	32.8	12	16.9	16	23.2
Total	67		68		67		71		69	

Table XII.
Database management

EL
33,3

- ignorance and apathy among librarians;
- poor funding of libraries;
- lack of funds to pay/sponsor for the training;
- lack of facilities needed for such training in some of the skills programmers;
- insufficient skilled personnel to train the librarians in the country;
- limited training opportunities within the country; and
- lack of motivation by the library administration.

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Interviewees also discussed the effects of the non-acquisition of ICT skills on information delivery:

- inefficient information delivery;
- loss of time and energy in meeting user information needs;
- inability to handle user queries;
- lack of skill navigating the Internet will hamper provision of the most current information resources;
- hinder resource sharing among libraries in this globalised information age;
- hinder online reference services such as SDI, CAS and proper information delivery;
- affect rate of use of library services by appropriate users;
- make the library redundant and not move in line with current trends in the profession; and
- lead to other information professionals taking away information delivery from libraries and librarians.

Strategies suggested by the respondents are as follows:

- institutions should provide funds for training of their staff in IT skills acquisition;
- libraries should provide functional IT facilities which will enable librarians to practise what they have learned;
- regular and consistent upgrading of digital facilities;
- trained and skilled personnel should be invited from other countries to help train the librarians;

Extent	Able to report a database for management use		Knowledge of ODBC use to connect forms to database	
	No.	(%)	No.	(%)
Very large	5	7.5	2	2.9
Large extent	16	23.9	13	19.1
Small extent	26	38.8	22	32.4
Not at all	20	29.9	31	45.6
Total	67		68	

Table XIII.
Database
management

Extent	Familiarity with the word "web server"		Able to differentiate between http and www		Familiarity with the word URL		Familiarity with the word "html"		Familiarity with the word "html tag"	
	No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)
Very large	14	19.7	12	16.4	20	27.4	19	26.0	14	19.7
Large	21	29.6	28	38.4	27	37.0	24	32.9	15	21.1
Small	22	31.0	19	26.0	16	21.9	17	23.3	24	33.8
Not at all	14	19.7	14	19.2	10	13.7	13	17.8	18	25.4
Total	71		73		73		73		71	

ICT skills acquisition

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Table XIV.
Web design

Table XV.
Web design skills

Extent	Familiarity with the word "dynamic html"		Able to differentiate between ASP and PHP		Familiarity with the word CMS		Familiarity with the term "DNS"		Able to differentiate among "website", "homepage", "domain name"	
	No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)
Very large	13	18.6	5	7.1	10	13.9	10	14.3	19	26.4
Large	11	15.7	8	11.4	11	15.3	9	12.9	20	27.8
Small	24	34.3	27	38.6	21	29.2	24	34.3	24	33.3
Not at all	22	31.4	30	42.9	30	41.7	27	38.6	9	12.5
Total	70		70		72		70		72	

- librarians should develop interest and zeal to acquire the needed IT skills;
- sponsorship to attend IT-based conferences and workshops;
- cooperate with academic libraries who have computer centres for staff training on ICT skills;
- review and update the curriculum and teaching methods by the library schools; and
- integration of digital library technologies in library and information science curriculum.

Discussion of findings

Information sources are now mainly in electronic form, such as e-books and e-journals, which can only be accessed through the Internet and online databases. All libraries are striving to provide a digital environment; therefore, services to the users should also involve e-services which require library staff to have ICT skills. Thus, it is important to know the level of ICT skill competences and knowledge of librarians, as well as constraints which hinder librarians from having those skills. Nigerian university libraries cannot confidently handle digital libraries, online reference, IRs and other digital library services without having librarians with adequate ICT skills.

Many of the respondents do have skills and knowledge of email use and word processing tasks, although a number of them lack some skills such as password protection of documents, mail-merging, setting signature, setting holiday/vacation rules, filtering, creating folders, blocking an address, customising email, spamming emails, tagging an email, hanging paragraphs, bookmarking, referencing, footnotes and page notes, drop-cap and watermarking.

Electronic mail is an important skill requirement by librarians. Some of the services that libraries offer over email include requesting items to be borrowed or suggestions for purchase. Some libraries have email accounts developed so that patrons can ask a reference question electronically. This implies that, in addition to the usefulness of the skill for service provision, librarians also need these skills to be able to effectively instruct patrons in its use.

According to Weise, as cited in [Still and Campbell \(1993\)](#), the benefits of email services included the ability to access the library from remote sites, at any time of the day or night, and the ability to produce a printed record of the reference request, thus allowing for record-keeping. One big difference that email has made, according to the author, is making the internal operations of the library invisible to the patron, as the patron is generally unaware of which department handles each request.

Word processing is also a key skill requirement in libraries. It is particularly helpful in the production of useful library management reports. Reports require a variety of

Other applications	Total	Yes	(%)	No	(%)
FrontPage	76	14	18.4	62	81.6
Dreamweaver	76	14	18.4	62	81.6
None	74	31	41.9	43	58.1
Komodo	76	1	1.3	75	98.7
NotePage	76	10	13.2	66	86.8

Table XVI.
Use of other
applications

skills that all librarians should have. These are as stated in the study. For emphasis, the skills include data entry, basic word processing, page formatting and use of the toolbar. The highest form of word processing skill, however, is being able to navigate the various toolbars that are part of the word processing program. These include the Tools menu (which has spell check, word count and other functions), as well as the various options for saving your document. In a study conducted by Cornell Library (Davis, 1997), for example, word processing ranked the highest of examined skills, with 144 (96 per cent) of employers expecting minimally basic word processing skills. As librarians are often needed to teach skills to undergraduates, librarians should be adequately equipped with these skills. It is, therefore, good that many of the respondents possess these skills.

Many of the respondents lacked knowledge of search engines and directories, other than Google and Yahoo, respectively. Although many of the respondents claimed to know how to formulate a search query and how to refine the search during search operations, they do not know how to evaluate and catalogue e-resources. Training others to search the Web is simply an extension of the bibliographic instruction sessions by librarians. It is, therefore, important that they are sufficiently equipped for this service. Librarians are also expected to facilitate skilled information retrieval, intervene between the user and the information sources to help users evaluate what they retrieve and assume greater responsibility for learning and research outcomes. They, therefore, need to possess a high level of skills in Web and database searching, and information evaluation. It is common knowledge that, even when undergraduate students turn to the scholarly electronic resources licensed by libraries, their search skills are poor. They seldom, if ever, use advanced search features, do not understand that result sets are not necessarily organised by relevance to their query and often look only at the first page of 10-20 items retrieved. Even if they come into the library, users seldom consult a reference librarian. In response, librarians – reference librarians in particular – should be prepared to develop Web-based and electronic database training materials to teach critical thinking skills and search techniques to remote or Web-enthralled users. In addition, acquisitions librarians should know that there is a lot of acquisition information available on the Internet – publishers' catalogues, bookstore reviews, lists of book catalogues and book clubs. They can also place orders on the Internet. Cataloguers should know how to access other libraries' online catalogues via the Internet in order to download or upload cataloguing records.

Many of the respondents do not know about database management and are not skilled in Web design or familiar with Web design applications. Knowledge of database management and creation and maintenance of a database are crucial to librarians for successful management and use of information. Skills include the ability to use data effectively to improve programs; knowing how to use database software to find records, sort, print and other functions; how to use built-in forms and reports in a database; exploring the software and learning new commands; understanding definitions, program guidelines and sources of data; developing clear channels of communication; knowing how to install files, import and export data, maintain backup files and make copies of files; creating new folders; knowing how to email files; understanding how to download files from email or from websites; understanding Windows concepts, including how to explore folders and files, and how to create or remove shortcuts from the desktop and/or the start menu; and understanding database design concepts,

including relational database design (table structure; one-to-many relationships), and the benefits and limits of various types of databases, including PC and online databases.

Experience in the use of SQL (structured query language) to define, manipulate and access a database is very important. So also is a thorough understanding of tools and utilities to maintain a database, including functions such as image copy, upload, reload and reorganisation; detailed knowledge of performance thresholds and indicators in a database; and of application development requirements of a database, such as levels of security. The requirement for MySQL database management skills, for example, adds a significantly higher threshold for the would-be database administrator.

Web design skills are another skill set which allows librarians to promote e-resource tips and update their subject information pages. These skills are in high demand by libraries requiring holistic services delivery. A librarian with a website can establish his or her expertise in a subject discipline through a resource list or provide more detailed information about himself or herself.

Recommendations

- For librarians to have adequate skills in all aspects of email and word processing, there is training and updating which may involve in-house training in every aspect of email activities and word processing, especially those tools and techniques which will help to render e-library services.
- Lack of knowledge in the use of search engines and directories may require national workshops organised by the Nigerian Library Association in which experts are invited to direct other librarians on how to access and use other search engines apart from Google and Yahoo.
- Lack of knowledge of database management, subject gateways, specialised databases, Web design and Web design applications could be gained through sending librarians to short courses on the above ICT skills, both within and outside Nigeria.
- For the librarians to acquire the necessary skills, it is necessary for the government and stakeholders involved in the management of university libraries to provide funds for ICT training and for ICT infrastructure acquisition in libraries.
- Rudimentary knowledge on ICT can be obtained from degree program training of the librarians; therefore, it necessary to review the curriculum and teaching methods in the training of librarians.
- Librarians are also challenged to be proactive so as to meet up with the demand for IT skills. A number of training resources can be found on the Internet and are available to any librarian willing to develop himself/herself.

Conclusion

Based on the study results, many librarians in Nigeria are lacking IT skills. As shown in the introduction, the review of the literature and the above discussion, it is also clear that IT skills of librarians will determine the future of academic and research libraries. Librarians will, therefore, be required to have more breadth and depth of IT knowledge and skills to be able to function effectively in the digital and electronic age.

This study is limited to the university libraries in the Southern part of Nigeria. Conducting a similar survey in the university libraries in the other geopolitical zones of Nigeria would be useful to confirm our findings.

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