ARTICLE

SKILLS AND COMPETENCIES REQUIRED BY ACADEMIC LIBRARIANS IN AN INTERNET-DRIVEN ENVIRONMENT

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Abstract

This paper reviews literature on the skills and competencies required by academic librarians in an Internet-driven environment. Content analysis methodology was used to review literature. Purposive sampling was also used for identifying literature on skills and competencies of librarians in the use of Internet services in academic libraries. A total of 118 publications were selected. Findings from the articles reviewed show that librarians from developed countries required skills and competencies in Internet usage to provide effective library services. However, the findings also show that academic librarians from developing countries, especially in Africa, are still lagging behind regarding Internet skills and competencies to provide effective information services in the library. The paper concludes that despite changes brought by the Internet, there are still gaps in the way library services are provided because of poor Internet knowledge, skills and competencies of academic librarians. The paper recommends that academic librarians in African countries acquire Internet skills and competencies to update their knowledge and technological skills for effective library service provision.

Keywords: skills and competencies; Internet; academic librarians; academic libraries

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INTRODUCTION

Internet services in academic libraries are meant to assist academic librarians in bridging the prevailing information provision gaps in the teaching, learning and research needs of the users (Olasore and Adekunmisi 2015; Ron 2015). The emergence of the Internet has opened opportunities for librarians to quickly reach out to many users at the same time (Adeyinka, Akanbi-Ademolake, and Olufemi 2017).

There is no single universal definition of the term "skills and competency". Ferrari (2012) defines skills and competencies as a set of knowledge, skills and attitudes (including abilities, strategies, values and awareness). Danner and Pessu (2013) view skills and competencies as the ability to combine and apply relevant attributes to particular tasks in a particular context. These attributes include a high level of knowledge, values, personal disposition, sensitivities and capabilities as well as the abilities to put those combinations into practice in appropriate ways. For the purpose of this paper, skills and competencies will be understood to mean knowledge, skills, and abilities required by academic librarians to provide effective library services with the assistance of the Internet.

CONTEXTUAL SETTING

Internet platforms assist librarians to facilitate easy access to information beyond the traditional service delivery (Abubakar and Adetimirin 2015). Howe (2016) posits that libraries have been transformed into digital and virtual environments where books and journals are now available as e-books and e-journals. These innovations require Internet knowledge, skills and competencies in providing access to library resources and services.

One of the pertinent issues which professional bodies, governments, development partners and associations have focused on in recent times is the skills and competencies required by academic librarians in Internet use for effective and efficient library services. For example, the American Library Association (ALA 2012) provides a standard for Internet competencies for practising librarians in the United State of America. The International Federation of Library Association (IFLA 2016) recommends that librarians should have skills and competencies in metadata, digital contents, content creation, support in online search, and cybersecurity in enhancing effective library services.

Despite the effort made by previous bodies to help librarians to gain Internet knowledge, skills and competencies, challenges of learning new technologies on Internet services persist in developing countries and Africa in particular. For example, Ansari (2013) has observed that librarians in Pakistan find it difficult to keep pace with new challenges. In Africa, a review of literature reveals that librarians are still facing challenges of providing library services using the Internet. For example, Echezona, Ibegbulem and Nwegbu (2015) state that many librarians are finding it difficult to be

familiarised with the Internet in the provision of library services. These challenges become more serious when librarians lack the required skills and competencies in using the Internet which some writers consider a gap in providing library services in the digital age (Echezona, Ibegbulem, and Nwegbu 2015; Elmore 2014; Ivala and Gachago 2012).

Unfortunately, Library and Information Science schools and departments have come short of solving this problem. One of their challenges has to do with developing curriculum that includes Internet knowledge. As rightly observed by Mutula (2001) and Kamba (2011a), the traditional skills and competencies are still frequent among librarians in many parts of African countries because library schools teach traditional knowledge of librarianship.

OBJECTIVES

The objectives of the paper are to:

- identify skills and competencies required by academic librarians in an Internet environment;
- determine coverage of skills and competencies in Internet use of academic librarians in the literature;
- establish challenges of acquiring skills and competencies in Internet use by academic librarians; and
- provide recommendations based on the findings.

METHODOLOGY

The paper used various search strategies to locate literature on Internet skills and competencies required by academic librarians in providing effective library services. Online databases, including Library and Information Science Abstracts (LISA), Science Direct, EBSCOhost, Emerald, Africa Journal Online (AJOL), and Google Scholar accessible through the University of Botswana Library's portal were searched for relevant literature. Information was also retrieved from books and conference proceedings covering Internet competencies. Furthermore, journal articles were consulted because they offer relatively concise and up-to-date research findings. The literature search targeted abstracts of publications to help identify relevant articles on the skills and competencies of librarians in Internet use. The sources were selected because they are authoritative and comprehensive in the research area of the paper. The searches focused on articles published between 2010 and 2017 and excluded those that were not published in English.

A purposive sampling technique was used for the selection of publications for this paper. The review search which was based on the coverage of librarians' Internet

skills and competencies identified in the literature was conducted in four phases. At the beginning of the literature search, 431 articles were retrieved based on keywords such as Internet, Internet adoption, skills and competencies, academic librarians and academic libraries. After reviewing each publication, 98 articles were eliminated because the titles did not focus on the area of study. The second phase of the search focused on the abstract of each article. A total of 81 articles were eliminated because the key elements of the abstracts did not cover skills and competencies required by academic librarians. In the third phase, 78 articles were also eliminated because they focused on librarians in general while the focus of this paper is on academic librarians. The last phase eliminated 56 of the articles because they discussed librarians' skills and competencies in general while this paper's focus is Internet skills and competencies of academic librarians. Therefore, out of the 431 articles retrieved, only 118 were selected for inclusion in the review. This paper employed a content analysis in reviewing the literature. According to Rani, Yadav and Jain (2016), a content analysis is a research methodology that builds on procedures to make valid inferences from the text. A content analysis provides accurate, precise, reliable, replicable and valid data.

FINDINGS AND DISCUSSION

The findings and discussion are covered under the following sub-headings: skills and competencies required by librarians in an Internet-driven environment; the coverage of skills and competencies of Internet use by academic librarians; and the challenges associated with acquiring skills and competencies of Internet use by academic librarians.

Skills and Competencies Required by Librarians in an Internet-Driven Environment

The first objective sought to identify the Internet competencies required by academic librarians. The literature revealed the major competencies as presented in Table 1.

Table 1: Identified Internet competencies required by academic librarians

Internet Competencies Coverage	Frequency	Percentage (%)
Knowledge of electronic resources	18	15.2
Social media skills	17	14.4
Online searching	15	12.7
Website content	14	11.8
Knowledge of library software	13	11.1
Knowledge of computer and multimedia	11	9.3

Internet Competencies Coverage	Frequency	Percentage (%)
Cloud computing	9	7.6
Metadata creation	8	6.7
Library digitisation	7	5.9
Knowledge of library automation	6	5.1
	118	**100**

Source: Literature Review 2017

While the world is moving fast with regard to the need for librarians to obtain Internet competency in bridging the information provision gaps, the literature review indicates that librarians in developing countries especially in Africa are still lagging behind because of poor Internet knowledge, skills and abilities. The major Internet competencies findings from literature are discussed as follows:

Knowledge of Electronic Resources

Knowledge of electronic resources is one of the basic Internet skills and competencies required by academic librarians. In this regard the findings reveal that 18 (15.2%) articles identified knowledge of electronic resources as an important competence required by librarians. Of the 18 (15.2%) articles, 10 (8.4%) focused on e-journals, e- newspapers, e-magazines, and e-books, while 8 (6.7%) highlighted the importance of electronic resources creation and maintenance. Raju (2017) maintains that knowledge of electronic resources assists librarians to share knowledge and to communicate information on searching, retrieval and sharing, resulting in better access to information and speedy delivery of information to users.

Social Media Skills

Librarians are gradually utilising the present social networking sites such as Facebook, Myspace, YouTube, Wikis and Twitter to provide an interactive platform for users to access and generate content. This platform creates an atmosphere for librarians to interact with their users to study their needs, to give feedback, and to provide photo-sharing opportunities – where archival pictures can be posted to users or uploaded on the library website. In this regard the findings reveal that 17 (14.4%) articles identified social media skills as an important competence required by librarians. Of the 17 (14.4%) articles, 8 (6.7%) focused on Facebook while the remaining 6 (5.1%) focused on skills and competencies in Twitter, Snapchat, Instagram and YouTube. Thus, social media enables users to have an open access to knowledge and to contribute local content on the social network space.

Online Searching

Online searching is one of the key functions carried out by librarians in providing information services. Findings reveal that 15 (12.7%) articles underline online searching as one of the competencies required by academic librarians. Out of 15 articles, 11 (9.3%) focused on understanding the digital environment, metadata standards, and knowledge of portals and portals. Online learning, online information services, digital rights management; Wi-Fi and RFID technology were identified by four (3.3%) articles. Ilo and Ifijeh (2010) and Ivala and Gachago (2012) suggest that librarians require to be competent in Internet use when searching through the integrated library systems (ILS), built digital collections and developed institutional repositories (IRs). Similarly, Ayoku and Okafor (2015) maintain that academic librarians require 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.

Website Content Management

Internet competencies in website content management enhance the provision of information services in the library. According to the findings, 14 (11.8%) articles identify website content management as an important competence. Of 14 (11.8%) articles, 7 (5.9%) focused on Web development and authoring using HTML/XML, FrontPage, and Dreamweaver; maintaining websites and mastering Web 2.0 functions. Four (3.4%) articles discuss systems development, systems applications, the installation of software, upgrading of software, maintenance, installation and troubleshooting of hardware as required Internet skills. Grgic and Zivkovic (2012) reported that librarians require Internet skills and competencies in website content management, browsing websites, identifying and removing of spam, searching for privacy settings of the Internet, and searching for information necessary for meeting the goals of the library.

Knowledge of Library Software

Knowledge of library software is an important Internet skill and competence required by academic librarians. Findings indicate that 13 (11.1%) articles highlighted knowledge of library software as an important Internet competence for academic librarians. Of 13 articles, 8 (6.7%) focused on library software especially in the general knowledge of library automation, microcomputer applications, mainframe computer applications, CD-ROM products, computer hardware and networks. Five (4.2%) articles recognised developing library software and image technology as important competencies. Studies conducted by Ayoku and Okafor (2015) and Ibrahim (2015) concur that academic librarians should acquire Internet competencies by gaining knowledge of library software such as building multimedia platforms for effective library services.

Knowledge of Computer and Multimedia

Internet skills and competencies in applying computer and other multimedia devices are important requirements for academic librarians. According to the findings, 11 (9.3%) articles identify knowledge of computer and other multimedia devices as one of the important Internet competencies. The findings also indicate that librarians need to be conversant with computer operating systems, processors, memory systems, machine language, and metadata. Kamba (2011b) and Bhatti and Nadeem (2014) maintain that librarians require familiarity with computers and other multimedia devices in the storage, processing and dissemination of information.

Cloud Computing

Internet skills and competencies in cloud computing are an essential element required by academic librarians. Findings reveal that nine (7.6%) articles emphasise cloud computing. Of the nine articles, seven (5.9%) focused on knowledge of server development, client-server installation and computer infrastructure, while two (1.6%) highlighted the deployment and maintenance of servers. Ogbu and Lawal (2013) explain that cloud-computing skills and competencies offer librarians the opportunity to drive technologies towards the present condition that is affirmed by a virtualised and networked environment.

Knowledge of Metadata Creation

Internet skills and competencies in metadata creation are paramount requirements for academic librarians in providing effective library services. This involves the ability to understand the structure and workflows of metadata creation within the library services platform. Findings reveal that 12 (10.2%) of the articles focused on metadata creation. Of the eight (6.7%) articles, five (4.2%) focused on subject analysis of content for assigning classification numbers, subject headings, index terms and other subject descriptors towards the organisation and retrieval of information of all types (including research data), while three (2.5%) focused on understanding and applying internationally recognised standards such as Resource Description and Access (RDA), Machine-Readable Cataloguing (MARC), Dublin Core, Dewey Decimal Classification, Library of Congress Subject Headings and Medical Subject Headings. This finding is in agreement with research conducted by the ALA (2012) which revealed that librarians require skills and competencies to organise print and digital information resources for in-person or remote accessing from electronic library catalogues, IRs and other database formats. Similarly, Batool and Ameen (2010), the California Library Association (2010) and Elmore (2014) maintain that authority control provide the necessary cross-referencing within an information retrieval system such as a library catalogue. Chung (2015) emphasises the importance of acquiring skills and competencies in metadata creation and management to promote discoverability and to enhance access to the

library's information resources in all formats as well as broader bibliographic control of information resources in all formats.

Library Digitisation

Knowledge of library digitisation is one of the Internet competencies required by academic librarians. Findings reveal that seven (5.9%) articles identify digital resources as one of the key Internet competencies. Other articles emphasise the importance of knowledge of computer hardware, installation and troubleshooting. Batool and Ameen (2010) and Davis (2016) suggest that librarians have to demonstrate a high level of understanding of digital resources and services in order to provide effective and efficient library services.

Knowledge of Library Automation

Acquiring Internet skills and competencies in library automation marks the turning point for librarians to be proactive in the provision of library services. Findings reveal that six (5.1%) articles identify library automation as an important skill. Specifically, knowledge of the following systems is mentioned: Computerized Documentation System/Integrated Set for Information Systems (CDS/ISIS), Library Automation and Management Program (LAMP), WINISIS, Inmagic, and Virtua.

Coverage of Skills and Competencies of Internet Use by Academic Librarians

Objective 2 of the paper was to establish the coverage of Internet skills and competencies in the literature. The coverage is viewed from three different perspectives: resources of the article, geographical spread, and methodology. Table 2 displays the resources of review.

Table 2: Resources of review

Resources of Review	Frequency	Percentage (%)
Google scholar	44	37.3
Emerald	24	20.3
EBSCOhost	14	11.8

Library and Information Science Abstract	12	10.1
Africa Journals Online	9	7.6
Journals (Print)	8	6.8
Books	5	4.2
Newspapers (Print)	2	1.7
	118	**100**

Source: Literature Review 2017
Note: For the purpose of analysis, the duplication of article appearance was considered in analysing the table.

The findings reveal that 44 (37.3%) publications are located in Google scholar. The findings also show that 24 (20.3%) publications are located in Emerald, while only 2 (1.7%) are located in print newspapers. The implication of this finding is that the majority of articles reviewed in this paper were sourced from Internet resources. It is possible to surmise that Internet resources are much more accessible than print resources.

In terms of authorship, most of the publications emanated from librarians teaching in library schools while a few were from practicing librarians. Therefore, there is a need for the latter to make scholarly contributions to what they perceive as critical Internet skills and competencies required by academic librarians.

Geographical Spread of Publication Location

Table 3 presents the geographical spread of publications reviewed in this paper. The locations are classified as follows: the United States of America, Europe, Asia and Africa.

Table 3: Geographical spread of publications

Location	**Frequency**	**Percentage (%)**
United States of America	40	33.9
Europe	33	27.9
Asia	27	22.9
Africa	18	15.3
	118	100

Source: Literature Review 2017

The findings indicate that 40 (33.9%) of the publications were from the United States of America, while 33 (27.9%) were from Europe; and 27 (22.9) from Asia. Only 18 (15.3%) were from Africa. The implication of this finding is that more academic publications on Internet competencies are from developed countries than developing countries. This means that librarians from developed countries are more likely to be aware of the required Internet skills and competencies than their counterparts from developing countries. This finding is in agreement with Echezona and Chigbu (2015) who suggest that many librarians in developing countries, especially Africa, are still lagging behind in acquiring Internet competencies.

Methodology Used

Table 4 presents the method of data collection used in the reviewed literature. Various methods of data collections such as questionnaires, questionnaires and interviews, questionnaires and observation, and focus groups were identified in the literature.

Table 4: Methods for data collection used in the reviewed literature

Methods of Data Collection	Frequency	Percentage %
Questionnaire	77	65.2
Questionnaire and interview	19	16.1
Questionnaire and observation	13	11.1
Focus group	9	7.6
	118	**100**

Source: Literature Review 2017

The findings indicate that in 77 (65.2%) of the articles the questionnaire was used for data collection; while in 19 (16.1%) both the questionnaire and interview were used. A combination of questionnaire and observation methodology was used in 13 (11.1%) articles, while focus groups were used in 9 (7.6%). The implication of the findings is that there is a gap in the approaches used for data collection. The preponderance of evidence suggests that quantitative approaches are preferred to qualitative methods. This paper excluded an analysis of theoretical frameworks used because there is no evidence of explicit mention of these in the literature reviewed.

Challenges of Skills and Competencies in Internet use by Academic Librarians

The Internet offers a wide range of free, professional tools that are used by academic libraries for a variety of purposes. However, literature from Africa indicates that librarians are facing serious challenges in using the Internet to provide library services because they lack Internet skills and competencies (Echezona, Ibegbulem, and Nwegbu 2015; Kamba 2011b). Some of the challenges identified in the literature are as follows:

Poor Internet Skills and Competencies

Many academic librarians in developing countries have poor Internet skills and competencies. Bhatti and Nadeem (2014) state that librarians in developing countries have poor Internet competencies especially in password protection of documents, mail-merging, setting of signatures, setting holiday/vacation rules, filtering, creating folders, blocking an address, customising email, spamming emails, tagging an email, using hanging paragraphs, bookmarking, referencing, footnotes and page notes, drop-cap and watermarking. Internet skills and competencies are important for librarians in entire library systems and sub-systems. Libraries have developed Internet services such as email accounts for their patrons to make enquiries electronically. This implies that, in addition to the usefulness of the skills for service provision, librarians also need these skills to be able to effectively instruct patrons in its use. According to Fernandez and Buenrostro (2015), the benefits of Internet services to librarians include the ability to access the library from remote sites, at any time of the day, and to produce a printed record of the reference requested, thus allowing for record-keeping.

Insufficient Internet Knowledge

Some academic librarians lack knowledge of using Internet search engines and directories, except for Google and Yahoo, and evaluating and/or cataloguing e-resources using the Internet (Gbaje and Ukachi 2011). According to Rodriguez (2015) internet knowledge involves the ability to not only search the Web but also to extend the bibliographic instruction sessions to patrons. It is 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. The need for librarians to possess a high level of knowledge in Web and database searching, and information evaluation is therefore desirable for effective library services. Librarians should acquire knowledge of Web-based and electronic databases to enhance search techniques to remote or Web-enthralled users. In addition, academic librarians should develop knowledge of database management and be familiar with Web-design

applications. Knowledge of database management creation and maintenance is crucial to librarians for successful management and use of information.

Inadequate Training

Poor training results in poor skills and competencies. Uwaifo and Azonobi (2014) stress that poor Internet competencies resulted from the lack of adequate training of librarians. Inadequate skills and competencies have hindered the use of the Internet and other digital resources in academic libraries. Many academic librarians in Africa find it difficult to integrate Internet skills with the traditional method of information service delivery owing to poor training (Rose, Eldridge, and Chapin 2015). As such, many librarians are not willing to embrace the new technology in the provision of information services.

Academic librarians should develop skills in programming, the use of library software, and online searching. They also need training in using built-in forms and reports in a database management system, exploring the software and learning new commands, understanding definitions, programme guidelines and sources of data, developing clear channels of communication, and knowing how to install files and to import and export data. Fernandez and Buenrostro (2015) maintain that librarians' poor training in maintaining backup files, creating new folders, managing email files, downloading email attachments or files 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 could lead to poor library services.

Poor Attitude to and Perceptions towards the Internet

Some academic librarians in developing countries are not competent to take on the challenging role of information service delivery of the twenty-first century. They perceive the Internet as a threat to their jobs. They are also averse to technology and perceive the Internet to be taking over library operations. This being the case, they are reluctant to embrace new technology. Abubakar and Adetimirin (2015) assert that many librarians lack confidence in the face of increasing information technology. This slows service delivery and retards productivity.

Lack of Internet Awareness

A significant number of academic librarians in developing countries are not aware of the Internet and its contribution to library services. For example, Baro and Asaba (2010) and Echezona and Chigbu (2015) argue that the lack of Internet awareness is still observable among librarians in developing countries in transforming digital content for proper use.

Scarcity of Internet Technology Literacy

Some academic librarians lack the requisite technological literacy needed for a twenty-first century library service. Technological literacy can be viewed as the ability to responsibly use Internet technology to communicate, solve problems, access, manage, integrate, evaluate, design and create information to improve learning in all subject areas and acquire lifelong knowledge and skills (Raju 2014). Danner and Pessu (2013) state that one of the major challenges facing the twenty-first century library is not underfunding but poor performance of librarians in developing literacy skills on various Internet technologies in providing effective library service. Anyira and Nwabueze (2011) add that librarians without a well-developed Internet literacy cannot render effective library services.

CONCLUSION

Internet competencies are essential for librarians to provide effective library services. The Internet has become a standard tool which developed countries have adopted in their libraries to access, network and provide effective information services. The Internet has also become a platform that assists librarians to facilitate easy access to information beyond the traditional information service delivery in the library. Twenty-first century librarians have transformed library services into a digital and virtual environment where books and journals are now available as e-books and e-journals. These innovations require librarians to attain Internet knowledge, skills and competencies. The ideal is for librarians in developing countries to acquire Internet competencies as a vital tool in providing effective information services.

RECOMMENDATIONS

Based on the findings and discussion, the paper recommends that:

- academic librarians in developing countries acquire skills and knowledge of the Internet in providing library services in a constantly changing environment;
- academic librarians acquire Internet skills and competencies to update their knowledge and technological skills;
- Library and Information science schools and departments in developing countries develop curriculum content that includes Internet knowledge and digital technology; and
- acquiring knowledge of the Internet be compulsory for academic librarians to develop competencies.

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