ICT proficiency: perspectives of Tangaza University College librarians in Kenya

Stanislaus L. Agava

Department of Library, Tangaza College, Nairobi, Kenya

Peter G. Underwood

Department of Information Science, Faculty of Engineering, Built Environment and IT, University of Pretoria, South Africa

***Corresponding author:** Stanislaus L. Agava can be contacted at: agavastanislaus1759@gmail.com

Abstract

Purpose: This study aims to assess the information and communications technology (ICT) proficiency of library and information science (LIS) professionals working in Tangaza University College (TUC) Library, Kenya.

Design/methodology/approach: A qualitative research design using a single case study was adopted in the study, which gathered data through a census. Data were collected using a structured interview.

Findings: The study findings indicated that the majority of TUC librarians have very high ICT competence in basic ICT and some Web technologies; however, they lack technical ICT skills. Furthermore, though ICT courses are offered during LIS professional training, TUC librarians lack opportunities to implement some of their advanced ICT skills. Lack of funding, time, practical lessons, personal interest, training opportunities and ICT obsolescence were highlighted as challenges librarians encounter in their pursuit of acquiring ICT skills.

Practical implications: The study recommends that regular ICT-related training programmes be conducted for librarians and be offered in the form of workshops, seminars and conferences. Furthermore, there is a need for an academic curriculum in LIS schools to have more practical ICT-related components. Library staff should be encouraged to develop a personal interest in pursuing ICT skills, and librarians should also make use of ICT training opportunities that are freely available online for personal development.

Originality/value: The study is beneficial to those concerned with developing training programmes for librarians to strengthen areas deemed to have shortcomings.

Keywords: Librarians, Library, Library and information science, Information professionals, Information and communication technologies, ICT proficiency

1. Introduction

The impact of information and communication technologies (ICTs) on library services and librarianship, in general, cannot be underestimated. It is becoming clear that libraries cannot adequately satisfy user demands in the current digital environment without being equipped with both ICT resources and professionals with the necessary expertise in ICT (Ahmed and Rehman, 2016, p. 1). The new library setup, therefore, demands that LIS professionals must possess suitable ICT skills.

This study was conducted at Tangaza University College (TUC) library, which is found in Nairobi County, Kenya. TUC is a Catholic institution with approximately 2,000 students according to the latest figures from the admission office. However, the library offers services to approximately 3,000 users (including the faculty, support staff, researchers and external users). TUC has no satellite campuses; hence, no satellite libraries either. TUC is currently seeking for a university charter. The library has 11 staff members, ten of them being qualified, licensed librarians.

1.1 Statement of the problem

The main question for this study is whether the current library and information science (LIS) professionals in Kenya, specifically at TUC, are adequately trained to handle library ICT-related duties. In an assessment of the training of LIS professionals in Kenya, Kavulya (2007, p. 220) observed that LIS academic programmes in the country failed to address the current job market requirements. One of the findings of this study indicated that there was a lack of adequate ICT content in LIS courses offered in Kenya. Considering Kavulya's findings and a paucity of research about this topic, this study endeavoured to assess ICT competence of librarians at TUC in Kenya.

1.2 Research questions

The study sought to find answers to the following research questions:

1. What is the ICT competency level of TUC librarians?
2. Which ICT skills do TUC librarians need to acquire to sufficiently meet the library users' information needs?
3. Which ICT-related units did TUC librarians cover during their professional training?
4. What are the challenges encountered by TUC librarians in acquiring ICT skills?

2. Literature review

Since the adoption of ICT in the library and its impact on the LIS profession, scholarly studies covering diverse and related aspects such as the impact of ICT on the employability of LIS graduates, ICT requirements necessary for the library jobs and so many others have been carried out (Beile and Adams, 2000; Kwasik, 2002; Shiholo and Ocholla, 2003; Gerolimos and Konsta, 2008; Mishra, 2009). Of interest to this research are studies that have explored the demand for ICT competencies in the LIS job market and status of ICT competencies among library professionals in different institutions and locations (Hoskins, 2005; Adeyoyin, 2005, 2006; Ugboma, 2008; Ademodi and Adepoju, 2009; Safahieh and Asemi, 2010; Thanuskodi, 2011). According to Ahmed and Rehman (2016, pp. 1-2), the findings from most of these studies indicate low levels of ICT competencies among LIS

professionals. However, there is a scarcity of studies regarding ICT competencies among library professionals in Kenya. In this regard, this knowledge gap justifies the need for research to be undertaken.

2.1 Information and communications technology competency of library and information science professionals

Competency entails skills or abilities that one possesses and are required for one to be able to "plan and execute an action geared at accomplishing some tasks or achieving some goals" (Astunkar, 2016, p. 52). In the case of LIS professionals, the need for one to be competent is based on the ultimate goal of the profession, which is to satisfy the information needs of the library user through the provision of various forms of information resources and services. Because of ICT, librarians need to revitalise their skills by possessing "additional capabilities, experience, knowledge and skills", (Astunkar, 2016, p. 52) other than the traditional library knowledge.

Today, ICT proficiencies are becoming the most preferred in the LIS job market as many libraries are continuing to adopt ICT use (Ayoku and Okafor, 2015, p. 505). However, according to Okiy (2010, p. 8), ICT competency and literacy among librarians are still low, hence slowing the gains brought about by globalisation. As a way forward, Okiy suggests that there is a need to train and retrain practising librarians in ICT. Even though Safahieh and Asemi (2010) in their study found out that librarians at the University of Isfahan in Iran appreciated the use of ICT in the library as tools that increase efficiency in operations, they discovered that the majority of them did not have good computer skills. A similar study by Hajar and Asefeh (2010, p. 97) at the same institution, on the level of computer literacy skills of librarians, indicated that the majority of the librarians did not have a good level of computer skills. According to the study, lack of adequate computer skills was limiting librarians from taking full advantage of computerised library facilities, thus hampering their effectiveness.

Farahi and Gandhi (2011, p. 168) carried out a comparative study to determine information technology (IT) skills among LIS professionals of medical libraries in India and Iran. They found out that LIS professionals from both India and Iran appreciated the importance of ICT in their job. However, there were low to moderate levels of ICT literacy among professionals. In a study on ICT skills and the proficiency of LIS professionals in universities in Karachi, Pakistan, Ansari (2013, p. 83) found that they were not equally proficient in all areas of ICT skills. In Nigeria, according to the study by Ayoku and Okafor (2015, p. 521), library and information professionals working in university libraries lacked adequate ICT competencies.

However, some studies have indicated a certain degree of ICT competency among library and information professionals. In their study on the status of ICT competencies of librarians at Punjab University, Batool and Ameen's (2010, p. 4) findings revealed that even though to some extent all librarians understudy lacked skills in computer hardware, they at least had some basic computer skills such as the use of word processing. In a study on the ICT competency of LIS professionals in the engineering institutions of Andhra Pradesh State, in India, Kumar (2013, p. 486), found out that there was evidence of satisfactory levels of ICT literacy among some of the librarians. Ansari's (2013, p. 83) findings in a study on the ICT competence of the LIS professionals in the universities of Karachi in Pakistan indicated that the majority of them were moderately competent.

Librarians' ICT proficiency could either be competence in basic or advanced ICTs. In their study, Pawar and Kaur (2015, p. 9) indicate what they considered should be the basic ICT skills of LIS professionals in the changing knowledge era. They indicate that librarians should have basic knowledge of library management systems. They should be able to download and install simple programs of supporting devices and simple knowledge about troubleshooting. They should be competent in using MS Office and should be knowledgeable of the various electronic resources as well as have some Web knowledge. The study also points out the need for librarians' expertise in the use of social media and mobile technologies. Narasappa and Kumar (2016, p. 57) confirm Pawar and Kaur findings by indicating that LIS professionals require essential ICT skills such as website design, word processing, spreadsheet, video conferencing, computer security, e-mail management, scanner knowledge, electronic presentation and database skills.

One way of acquiring ICT competence is through higher education, meaning that professional curricula should incorporate ICT course content.

2.2 Information and communications technology training of library and information science professionals

LIS schools have the mandate to strive towards producing information professionals who can handle the diverse needs of an information user, especially those that are ICT-related. Various LIS schools have the responsibility of reading the changing times and incorporating relevant courses in the curricula. For instance, the top three LIS study programmes in the USA are offered by the University of Illinois at Urbana–Champaign, the University of North Carolina at Chapel Hill and Syracuse University (World Ranking Guide, 2011). Buarki *et al.* (2011, p. 501) point out that the three LIS schools have managed to stay ahead of the rest because they have continuously integrated ICT training, and that is the reason why they have managed to stay abreast with the advancement of new technologies.

In their analysis of LIS education in Kenya, Rukwaro and Bii (2016, p. 13) assert that higher education ought to significantly transform a library and information professional who has the aim of providing effective information services. The incorporation of ICT training in professional education has, therefore, become necessary, as it helps to produce graduates who can implement the new technological tools in the library. Therefore, Ashcroft and Watts (2004, p. 291) recommended extensive ICT training for LIS professionals to develop their ICT literacy. It is in the view of Minishi-Majanja (2007, p. 7) that LIS schools should include ICT units into LIS course content.

However, according to Haneefa and Shukkoor's (2010, p. 62), ICT skills could also be acquired through staff continuing education, workshops and by attending conferences as alternative ways. This could be a remedy where there is a lack of sufficient ICT units in LIS curriculum, as well as the brief duration of the internship (Batool and Ameen, 2010, p. 6). Okiy (2010, pp. 5-6) in this study reported that librarians were experiencing organisational challenges such as lack of support from an authority, hence contributing towards lack of ICT skill. Furthermore, according to Okiy, the high cost of ICT infrastructure and lack of adequate ICT training programmes were also contributors. Kumar's (2013) study on ICT competencies for LIS professionals in the engineering institutions of Andhra Pradesh State in India echoes the findings of Okiy (2010). The findings of this study indicate that the lack of support from the management and poor infrastructural facilities were the main problems leading to low levels of ICT competencies. Financial challenges and negative attitude

towards ICT by the managers were pointed out in Arokyamary and Ramasesh (2013, p. 216) study on ICT competencies of LIS professionals in the engineering college libraries in Karnataka, India.

2.3 Information and communications technology training of library and information science professionals in Kenya

Since 1984, when the first university-level LIS education was launched at Moi University in Kenya and the first cohort of bachelors students admitted in 1988, there has been an increase in the number of students enrolling for LIS courses in tertiary institutions. Furthermore, there has been an increase in the number of LIS programmes initiated by different institutions of higher learning. Other than public and private universities, there are colleges and technical institutions offering LIS programmes, hence catering for those students who are interested in getting a certificate (a one-year post-high-school qualification) or diploma (a two-year post-high-school qualification) in LIS. According to Rukwaro and Bii (2016, p. 18) as well as data from the Commission for University Education in Kenya website (CUE, 2017), there are more than ten universities offering diplomas, bachelors and postgraduate degrees in LIS.

According to Kavulya (2007, p. 212), other than the traditional library science courses taught in LIS schools in Kenya, ICT has led to the introduction of some ICT-related courses. He observes that librarians in Kenya undergo the formal LIS programme with diverse ICT-related courses such as electronic information sources and services, introduction to information technology, multimedia systems, software development and application, electronic information sources and services, Web design basics, electronic records management, information systems development, electronic publishing, database management systems and information sources and systems.

However, despite the above-mentioned ICT-related units, studies have been done in Kenya, indicating the need for further training in ICT to equip LIS professionals. The findings from a study by Ondari-Okemwa (2000, p. 267), to examine the exact training needs of practising trained librarians in public university libraries in Kenya, indicate that in the wake of rapid changes in ICT, there is a need for continuous training of library staff in Kenya. The study highlights some ICT-related areas that librarians should be encouraged to train in, including a general introduction to information and telecommunication technologies as well as how to evaluate, handle and use computer hardware and software. They should also have a basic understanding of computer and information concepts and systems analysis.

While carrying out a needs assessment study on the training of LIS professionals in Kenya, Kavulya (2007, p. 208) found out that the then-existing LIS training programmes did not consider the job market requirements for LIS professions sufficiently. He pointed out that this was evidenced by "inadequate teaching resources in LIS training institutions; lack of adequate ICT content in the courses; courses that are irrelevant to the job market and inadequate length of industrial attachment".

Generally, there is an appreciation of ICT training being part of LIS training in Kenya. However, most of the studies recommend the need for diversified training that incorporates relevant ICT training to keep up with ever-changing technology. This is because the employability of an LIS professional today depends on, to some extent, the ICT requirements of the employer.

3. Methodology

To allow the author to collect data that would assist in developing an understanding of behaviours within a particular context and its impact on the phenomena being studied, the study employed a qualitative approach (Connaway and Radford, 2017, p. 214). The study also used a single-case design. The population under study comprised of all qualified librarians working in the TUC library. A census technique was used because the population was very small and reasonable to include its entirety in the study. Data were, therefore, gathered from every member of the ten respondents.

As the number of respondents was very small, a semi-structured interview was used as an instrument of data collection. Consequently, informed by the use of a semi-structured interview, qualitative data analysis was used. As the collected data were mostly in the form of text, the writer created themes by establishing relationships among categories using codes (Mugenda and Mugenda, 2003, p. 116). Themes were established prior to the analysis based on the research questions.

4. Discussion of findings

The findings of this study are organised thematically, according to the research questions. There was a 100% participation by the respondents.

4.1 Demographic information

The demographic information of librarians presented includes the highest LIS academic qualifications attained by the respondents, years of experience as professional librarians and the institution where they studied LIS (whether public or private). According to the findings, half of the respondents, 50%, had a bachelor degree in LIS. 40% had a diploma in LIS, while 10% were certificate holders in LIS. Furthermore, the majority of the librarians, 80%, had studied LIS in public institutions, while 20% did their LIS studies in private institutions.

Regarding their professional experience as librarians, 60% of the respondents indicated that they had an experience of ten years and above, 20% had an experience of 7–9 years, while 20% had an experience of 4–6 years.

4.2 Level of information and communications technology competencies by librarians

The level of ICT competency was divided into three categories; basic ICT skills, Web technology competency and ICT technical competency. The findings are presented in Tables 1–3

Table 1. Level of competence in basic ICT skills

Basic ICT skills	Very high	High	Low	Very low	%
Basic computing, e.g. word processing	100%				100%
Storing and copying data into a primary and secondary storage device	100%				100%
Retrieving documents from storage devices	100%				100%
Presentation skills, e.g. use of PowerPoint	80%	20%			100%
Statistical skills, e.g. SPSS, Excel	30%	50%	20%		100%
Digitisation, e.g. scanning and uploading	70%	30%			100%

Table 2. Level of competence in Web technologies

Web technology skills	Very high	High	Low	Very low	Response count
Internet surfing/browsing	100%				100%
Web content creation	10%	60%	30%		100%
Use of search engines	100%				100%
Use of e-mail	100%				100%
Web 2.0 skills, e.g. blogging and instant messaging etc.	20%	80%			100%
Use of social media platforms and networks	80%	20%			100%
Use of OPAC	100%				100%
Subject gateway/portals	40%	50%	10%		100%

Table 3. Level of technical ICT competence

Technical ICT skills	Very high	High	Low	Very low	Response count
Software design and integration		20%	70%	10%	100%
Online cataloguing and metadata	20%	80%			100%
System installation		10%	50%	40%	100%
Operating systems configuration and use	10%		40%	50%	100%
Information systems development		10%	30%	60%	100%
Use of interface design	20%	10%	20%	50%	100%
Minor repairs		30%	40%	30%	100%
Networking			20%	80%	100%

4.2.1 Level of competence in basic information and communications technology skills

All respondents indicated that they had very high basic ICT skills in basic computing, storing and copying data into primary and secondary storage devices as well as in retrieving documents from storage devices.

Of the librarians, 80% said that they had very high competence in presentation skills using PowerPoint, while 20% indicated that they had high competence in the same. Of the librarians, 70% said that they had very high competence in the digitisation of documents (scanning and uploading), while 30% said that their competence in the same is high.

Regarding the use of statistical packages such as SPSS and Excel, half of the respondents (50%) said that they had high competence. Only 30% said that they had very high competence, while 20% rated their competence as low in using statistical packages.

4.2.2 Level of competence in Web technology

All the librarians said that they had very high competence in internet surfing/browsing, use of search engines such as Google, use of e-mail and use of Online Public Access Catalogue (OPAC). Of the librarians, 80% rated their use of social media platforms and networks, such as Facebook, Twitter, as very high, while 20% rated their competence as high.

Of the librarians, 40% rated their competence in using subject gateway/portals as very high, while 50% rated their competence as high and 10% as low. Of the librarians, 20% rated their Web 2.0 skills such as blogging and instant messaging as very high, while the rest (80%) rated their competence as high. Lastly, only 10% of the librarians rated their competence in Web content creation as very high. The majority of the respondents, however (60%), rated their competence as high, while 30% rated their competence as low.

4.2.3 Level of technical information and communications technology competency

None of the respondents rated their competence in software design and integration as very high. However, 20% rated their competence as high, 70% as low and only 10% as very low. Of the librarians, 20% rated their online cataloguing and metadata skills as very high, while 80% rated their competence in online cataloguing and metadata skills as high.

None of the respondents rated their competence in system installation as very high. However, 10% rated their competence as high, 50% as low and 40% as very low. Only 10% of the librarians rated their competence in operating systems configuration and use as very high, 40% as low and 50% as very low. Similarly, none of the respondents indicated their competence in information systems development as very high. However, 10% of the respondents indicated high competence, 30% indicated low, while 60% indicated very low in the same ICT field.

With regard to the use of interface design, 20% of respondents indicated very high competence, 10% as high competence, 20% as low competence and 50% as very low competence. No respondent indicated they had very high competence in minor repairs. However, 30% of the respondents indicated they had high competence, 40% indicated low competence and 30% indicated very low competence.

Regarding competence in computer networking, no respondent indicated whether they had very high or high competence. However, only 20% of the respondents indicated low competence, and 80% indicated very low competence.

A comparison of the three categories of ICT competence shows that TUC librarians are well skilled in basic ICT skills than in Web technology and technical ICT competency. There were varying responses on the level of competencies in web technologies, though. All respondents indicated that they had very high competence level in using the internet (surfing/browsing), using search engines such as Google, using e-mails to communicate as well as using OPAC. The four areas of Web technology competencies scored highly because, according to the respondents, they used them on a daily basis. However, the findings indicate low competence in Web content creation.

Technical ICT competency received very low recognition as the majority of respondents indicated that either they have low or very low competence in software design and

integration, system installation, operating systems configuration and use, information systems development, use of interface design, doing of minor computer repairs and networking. It is only in online cataloguing and metadata that some librarians rated their skills as very high and high.

4.3 Library duties which require the use of information and communications technology frequently

This question was meant to find out from the librarians some of the duties they carried out that frequently required the use of ICTs. Respondents pointed out duties such as word processing, searching the catalogue and circulation of library information materials, cataloguing and data entry, online search, user training, communication (through email and social media) and digitisation (scanning and uploading).

According to the findings, librarians are using ICT in their daily duties. Some of the duties included word processing, searching the catalogue and circulation of library information materials, cataloguing and data entry, online search, user training, communication (through email and social media) and digitisation (scanning and uploading). Considering the use of ICTs in performing various tasks as indicated by the respondents, there is a need to equip TUC staff with the necessary ICT skills to serve their users adequately.

4.4 Level of library and information science training at which information and communications technology courses were covered

Respondents were asked to indicate at what level of their LIS training they had covered (studied) some of the ICT courses. The majority of respondents (60%) indicated that they had covered some ICT courses while doing their bachelor degree in LIS. Of the respondents, 30% had covered the courses at a diploma level, while only 10% covered them at a certificate level.

From the findings, the majority of the respondents indicated that they had covered some ICT courses while doing their bachelor degree studies in LIS. Considering these findings, because half of the librarians have a bachelor's degree, it means that the majority of them, in one way or another, have been trained in the use of ICT.

4.5 Information and communications technology-related courses covered during library and information science training

Respondents were asked to identify some of the ICT-related courses that were covered while pursuing their LIS studies. Figure 1 summarises some of the ICT themes according to the ICT courses that the respondents mentioned as having been part of the LIS training syllabus.

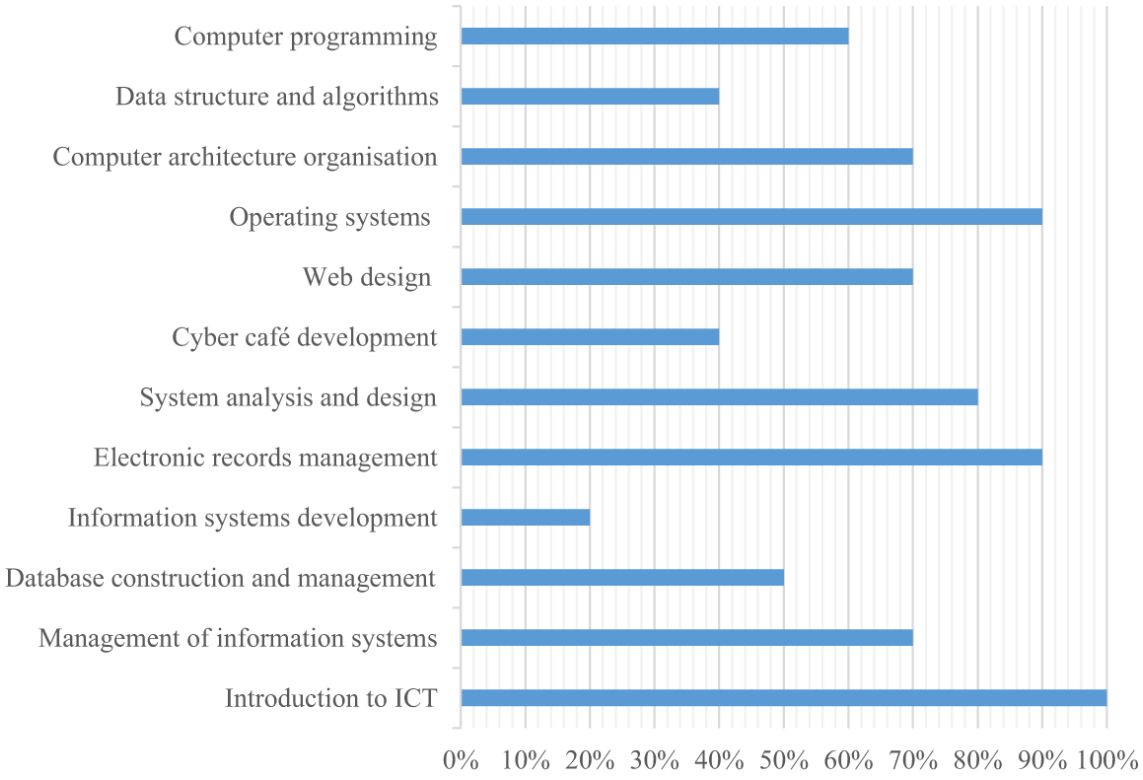

Figure 1. ICT-related courses covered during LIS training

According to Figure 1, all the librarians (100%) interviewed had covered a course on introduction to ICT. Of the respondents, 90% had covered a course on operating systems and electronic records management. Of the respondents, 80% said that they covered a course on system analysis and design. According to 70% of the respondents, they had covered a course on computer architecture organisation, Web design and management of information systems. Of the respondents, 60% said that they had covered a course on computer programming, while 50% of the respondents said they had covered database construction and management. Further, 40% said they had covered data structure and algorithms as well as cyber café development. And lastly, only 20% of respondents indicated they had covered a course on information systems development.

This finding corroborates with Minishi-Majanja's (2007, p. 4) call that LIS schools should include ICT units into LIS course content. It is quite evident that a variety of ICT courses covering basic ICT skills, Web technology competency and ICT technical competency were offered during the respondents' time of the study. For instance, all librarians interviewed indicated that they had studied introduction to ICT, which is an introductory course on computers.

However, the finding reveals some interesting patterns between ICT courses studied and ICT competencies of the respondents. According to Figure 1, two respondents indicated that they had studied information systems development. However, according to Table 3, no respondent indicated they had very high competence in information systems development. Only one respondent indicated that they had high competence in information systems development.

The rest of the respondents had indicated low and very low competence. This finding concurs with Minishi-Majanja's (2007, p. 5) assertion that “what is taught in the above modules does not always translate into comparable knowledge and competencies” in the workplace.

A correlation between the ICT courses covered at the time of LIS study and library duties that need the use of ICTs frequently reveals another interesting pattern. That librarians are only able to utilise a very small fraction of their ICT competence in relation to the ICT courses covered. In as much as they covered courses such as introduction to ICT, management of information systems, database construction and management, information systems development, electronic records management, system analysis and design, cyber café development, Web design, operating systems, computer architecture organisation, data structure and algorithms and computer programming, their daily duties and functions at the workplace only make use of the basics in ICT, hence leaving them with so much potential that is unutilised. Therefore, considering the number of ICT courses offered during LIS training as revealed by the findings, the author slightly disagrees with a study by Batool and Ameen, which concluded that lack of ICT competence among librarians was as a result of a lack of sufficient ICT units in the LIS curriculum (2010, p. 6). According to the findings, the number of ICT courses offered are many and diverse.

4.6 Preferred methods of information and communications technology training

The respondents were also asked to point their preferred method of acquiring ICT competencies. Respondents were free to suggest more than one preferred method. Considering that the respondents had full-time jobs, the study was interested in finding out the most suitable and flexible methods preferred for ICT training.

According to the findings, all the respondents (100%) indicated that they would prefer refresher courses through seminars, workshops and conferences. Most of them indicated that this method was favourable because they do not have much time to attend full-time classes.

Of the respondents, 80% said that they would prefer acquiring ICT skills through further studies in LIS training, and 70% of the total respondents said that they would prefer free online courses. Some of them said that having free access to the internet at the workplace meant that they can access some of the ICT courses. On-the-job training was also suggested by 70% of all the respondents who indicated that acquiring ICT skills through this method would be more practical and relevant.

The use of seminars, workshops and conferences as a preferred method scored highly because they run for a very short time, hence do not interfere with the work schedule. Many seminars, workshops and conferences are also sponsored, hence fitting the financial situation of potential attendees. Their choice of seminars, workshops and conferences seem to be preferred by other librarians in other regions. According to the study by Bhatti and Nadeem, the majority of LIS professionals in University Libraries of Pakistan preferred acquiring ICT skill not just through LIS studies, but also through informal training programmes such as staff continuing education, workshops and by attending conferences (2014, p. 60). They consider such methods as being more effective.

Other than seminars, workshops and conferences, the respondents mentioned other informal training such as enrolling for free online courses and on-the-job training as their preferred methods. According to the writer, on-the-job training could have a significant impact on the

librarians' ICT competence considering the discrepancy that exists between what the respondents have studied and their declared level of competence. One of the reasons why the discrepancy exists is that they were not able to practically apply what they studied which, in their case, is only possible while on the job.

The choice of enrolling for free online courses as another preferred method concurs with a study by Tzoc and Millard (2011, p. 14). In the study, they recommended various types of ICT training programmes for librarians including Web-based tutorials or joining Code4Lib, which is an online technical group where members share ideas on ICT skills. Enrolling for further study in LIS training was also mentioned as the second most preferred method of training. This could be because the respondents were aware that LIS schools had wide coverage of ICT courses, as presented in Figure 1. However, the worry is that though most of the LIS schools have developed relevant ICT modules, which, unfortunately, are offered theoretically. They lack the practical component that would allow them to be competent with a hands-on approach while on duty.

4.7 Challenges encountered in pursuit of acquiring information and communications technology skills

According to Ayoku and Okafor (2015, p. 519), “it is important to know the level of ICT competencies and knowledge of librarians, as well as constraints which hinder librarians from having those skills”. In this study, the respondents mentioned challenges such as lack of funding, lack of adequate time, ICT obsolescence, lack of practical lessons, lack of personal interest and lack of training opportunities as some of the challenges they encounter.

The finding on lack of funds concurs with the study by Eze on staff training programmes in Nigerian public libraries where lack of finances was pointed out as a challenge that hinders training of librarians (2012, p. 7). In fact, from the findings, it is due to lack of funding that refresher courses through seminars, workshops and conferences are preferred. According to Adeleke and Olorunsola (2010, p. 461), the use of seminars, workshops and conferences is one of the most effective ways of carrying out continuous professional training to equip librarians with ICT skills.

Lack of practical lessons was also pointed out as one of the challenges. Respondents explained that though they had covered ICT-related courses during their LIS study, the mode of learning was purely theoretical than practical. This fact corroborates findings presented in Figure 1, which shows that respondents had covered a number of ICT-related courses. However, their competence in technical ICT skills as presented in Table 3 was indicating otherwise. Majority of them indicated either low or very low competence in technical ICT skills. This could be attributed to a lack of practical lessons as well as the job environment, which impedes practising what has been learnt due to lack of practising opportunities.

5. Conclusions and recommendations

5.1 Conclusions

Since 2007, when Kavulya's study indicated that there was a lack of adequate ICT content in LIS courses offered in Kenya to 2020, tremendous improvement has taken place with regard to incorporating ICT-related courses in LIS academic programmes in the country. The findings of this study reveal that different LIS academic programmes, especially in

universities, have endeavoured to introduce future LIS professionals to ICTs considering the changing trends in LIS that demand ICT competencies. The findings of the study show that the majority of the library staff already have elementary or basic ICT knowledge such as word processing, digitisation and some basic Web technology skills such as internet browsing, e-mail, use of OPAC and social media platforms. However, they need to advance in ICT competencies and gain expertise in technical ICT packages, which would enable them to understand and work well with upcoming information management systems or technologies. These findings concur with studies by Anunobi (2004, p. 39) and Ansari (2013, p. 83), which indicated that the majority of librarians working in university libraries today only have basic ICT skills and lack technical ICT competence.

According to the literature review, some studies such as Batool and Ameen (2010, p. 6) indicated that lack of ICT competence among librarians was as a result of a lack of sufficient ICT units in the LIS curriculum. However, the findings from this study indicate otherwise. There is a wide range of ICT-related courses on offer as part of the LIS training, especially at a bachelor's level. However, developing or having relevant ICT modules seems not to translate into competency and use. Deducing from the findings, most of the ICT modules are offered theoretically, hence denying learners an opportunity to practice what they learn. Majority of them lack the practical component that would allow them to become competent in what they have learnt.

Though respondents highlighted some of the challenges experienced while in pursuit of acquiring ICT skills, they provided possible remedies. According to the findings, the respondents preferred refresher courses through seminars, workshops and conferences, further study in LIS training, free online courses and on-the-job training. These methods, therefore, form part of their continuous professional development, which, according to Odongo (2011, p. 39), is needed for the working LIS professional.

5.2 Recommendations

To keep up with the ever-changing ICT environment and make librarians always ICT-relevant, library schools and library professional associations, for instance, the Kenya Library Association (KLA), should regularly conduct ICT-related training programmes for librarians to meet their ICT-related needs in the changing world of librarianship.

Librarians should be encouraged and motivated to participate in conferences, workshops and seminars, especially those that provide an opportunity for professional development in ICT. And furthermore, librarians who are willing to further their studies should also be sponsored and given time by the administration to study.

There is a need for academic curriculum in LIS schools to have more practical ICT-related programmes. The practical component must be increased when teaching ICT modules. There is also a need for more practical opportunities such as internship for the new graduates. This will enable them to acquire the relevant skills that will make the job market accessible.

Librarians should be encouraged to develop a personal interest in pursuing ICT skills to remain relevant in the ever-changing ICT environment.

Acknowledgements

This manuscript is an extraction from the author's Master in Information Technology (MIT) mini dissertation concluded and submitted at the University of Pretoria in 2017. The MIT programme was made possible through funding from the Carnegie Corporation of New York in collaboration with the University of Pretoria, South Africa.

References

Adeleke, A.A. and Olorunsola, R. (2010), "ICT and library operations: more on the online cataloguing and classification tools and techniques in Nigerian libraries", Electronic Library, Vol. 28 No. 3, pp. 453-462, doi: 10.1108/02640471011052025.

Ademodi, D. and Adepoju, E. (2009), Computer Skill Among Librarians in Academic Libraries in Ondo and Ekiti States, Library Philosophy and Practice, Nigeria, Paper 274, available at: http://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1273&context=libphilprac (accessed 27 July 2016).

Adeyoyin, S.O. (2005), "Information and communication technology (ICT) literacy among the staff of Nigerian university libraries", Library Review, Vol. 54 No. 4, pp. 257-266, doi: 10.1108/00242530510593443.

Adeyoyin, S.O. (2006), "ICT literacy among the staff of West African university libraries: a comparative study of anglophone and francophone countries", Electronic Library, Vol. 24 No. 5, pp. 694-705.

Ahmed, S. and Rehman, A.U. (2016), "Perceptions and level of ICT competencies: a survey of librarians at public sector universities in Khyber Pakhtunkhwa, Pakistan", Pakistan Journal of Information Management and Libraries (PJIMandL), Vol. 18 No. 1, pp. 1-12, available at: http://journals.pu.edu.pk/journals/index.php/pjiml/article/viewFile/951/528 (accessed 17 June 2016).

Ansari, M.N. (2013), "ICT skills proficiency of library professionals: a case study of universities in Karachi, Pakistan", Chinese Librarianship, Vol. 36, pp. 72-84, available at: http://www.white-clouds.com/iclc/cliej/cl36ansari.pdf (accessed 16 September 2016).

Anunobi, C.V. (2004), "Computer literacy status of librarians in Imo State, Nigeria", Gateway Library Journal, Vol. 7 No. 2, pp. 32-41.

Arokyamary, R.J. and Ramasesh, C.P. (2013), "ICT skills and competencies of Engineering College LIS professionals in Karnataka: a perspective", SRELS Journal of Information Management, Vol. 50 No. 2, pp. 209-218.

Ashcroft, L. and Watts, C. (2004), "Change implications related to electronic educational resources", Online Information Review, Vol. 28 No. 4, pp. 284-291, doi: 10.1108/14684520410553778.

Astunkar, S. (2016), “LIS professional skills and competencies in electronic environment”, Abhinav-International Monthly Refereed Journal of Research in Management and Technology, Vol. 5 No. 6, pp. 51-54, available at: https://abhinavjournal.com/journal/index.php/ISSN-2320-0073/article/viewFile/1104/pdf_257 (accessed 16 January 2017).

Ayoku, O.A. and Okafor, V.N. (2015), “ICT skills acquisition and competencies of librarians: implications for the digital and electronic environment in Nigerian universities libraries”, The Electronic Library, Vol. 33 No. 3, pp. 502-523, doi: 10.1108/EL-08-2013-0155.

Batool, S.A. and Ameen, K. (2010), “Status of technological competencies: a case study of university librarians”, Library Philosophy and Practice, Paper 466, pp. 1-8, available at: http://unllib.unl.edu/LPP/batool-ameen.pdf (accessed 26 July 2016).

Beile, P. and Adams, M. (2000), “Other duties as assigned: emerging trends in the academic library job market”, College and Research Libraries, Vol. 61 No. 4, pp. 336-347, available at: file:///C:/Users/IMANILIB/Downloads/15380-18581-1-PB.pdf (accessed 26 July 2016).

Bhatti, R. and Nadeem, M. (2014), “Assessing training needs of LIS professionals: a prerequisite for developing training programs in university libraries of Pakistan”, Chinese Librarianship: An International Electronic Journal, Vol. 37, pp. 47-62, available at: http://www.white-clouds.com/iclc/cliej/cl37BN.pdf (accessed 2 August 2017).

Buarki, H., Hepworth, M. and Murray, I. (2011), “ICT skills and employability needs at the LIS programme in Kuwait: a literature review”, New Library World, Vol. 112 Nos 11-12, pp. 499-512, doi: 10.1108/03074801111190392.

Connaway, L.S. and Radford, M.L. (2017), Research Methods in Library and Information Science, 6th ed., Libraries Unlimited, California.

CUE (Commission for University Education) (2017), University Standards and Guidelines, CUE, Nairobi.

Eze, J.U. (2012), “Staff training programmes in Nigerian public libraries: the case of Enugu state public library”, Library Philosophy and Practice, Paper 775, available at: http://digitalcommons.unl.edu/libphilprac/775 (accessed 5 September 2017).

Farahi, M.T. and Gandhi, R.T.D. (2011), “IT skills among LIS professionals of medical libraries in India and Iran: a comparative study”, Annals of Library and Information Studies, Vol. 58 No. 2, pp. 161-169, available at: http://nopr.niscair.res.in/bitstream/123456789/12187/1/ALIS%2058%282%29%20161-169.pdf (accessed 5 September 2017).

Gerolimos, M. and Konsta, R. (2008), “Librarians' skills and qualifications in a modern informational environment”, Library Management, Vol. 29 Nos 8-9, pp. 691-699, doi: 10.1108/01435120810917305.

Hajar, S. and Asefeh, A. (2010), "Computer literacy skills of librarians: a case study of Isfahan University libraries", Iran, The Electronic Library, Vol. 28 No. 1, pp. 89-99, doi: 10.1108/02640471011023397.

Haneefa, M.K. and Shukkoor, C.A. (2010), "Information and communication technology literacy among library professionals in Calicut University, Kerala", DESIDOC Journal of Library and Information Technology, Vol. 30 No. 6, pp. 55-63, available at: http://publications.drdo.gov.in/ojs/index.php/djlit/article/viewFile/682/295 (accessed 10 August 2016).

Hoskins, R. (2005), "Information and communication technology (ICT) knowledge and skills of subject librarians at the university libraries of KwaZulu-Natal", South African Journal of Libraries and Information Science, Vol. 71 No. 2, pp. 151-163, available at: http://web.a.ebscohost.com.uplib.idm.oclc.org/ehost/pdfviewer/pdfviewer?vid=0&sid=4cb65164-884a-4dec-85d9-f53cda33dfff%40sessionmgr4008 (accessed 5 September 2017).

Kavulya, J.M. (2007), "Training of library and information science (LIS) professionals in Kenya: a needs assessment", Library Review, Vol. 56 No. 3, pp. 208-223, doi: 10.1108/00242530710735993.

Kumar, K. (2013), "Knowledge on ICT skills among LIS professionals of engineering institutions of Andhra Pradesh State: a survey", DESIDOC Journal of Library and Information Technology, Vol. 33 No. 6, pp. 480-487, available at: file:///C:/Users/IMANILIB/Downloads/5479-15041-1-PB%20(1).pdf (accessed 26 July 2016).

Kwasik, H. (2002), "Qualifications for a serials librarian in an electronic environment", Serials Review, Vol. 28 No. 1, pp. 33-37, doi: 10.1080/00987913.2002.10764704.

Minishi-Majanja, M.K. (2007), "Integration of ICTs in library and information science education in sub-Saharan Africa", Proceedings of the World Library and Information Congress and 73rd IFLA General Conference and Council, Durban, South Africa, 19-23 August 2007, pp. 1-19, available at: http://library.nust.ac.zw/gsdl/collect/toolbox/import/Integration%20of%20ICTs%20in%20Library%20and%20Information%20Science.pdf (accessed 1 August 2016).

Mishra, V.K. (2009), "Comparative study of essential qualifications/experience for library staff, skills required in ICT environment and syllabus of LIS Education in the digital era: a case study", ICAL-Change Management Libraries, Vol. 1, pp. 350-355, available at: http://crl.du.ac.in/ical09/papers/index_files/ical-59_128_285_2_RV.pdf (accessed 1 August 2016).

Mugenda, O.M. and Mugenda, A.G. (2003), Research Methods: Quantitative and Qualitative Approaches, ACTS Press publishers, Nairobi.

Narasappa, K.C. and Kumar, P.D. (2016), "ICT skills for LIS professional in the digital environment", Journal of Research in Library Science, Vol. 2 No. 2, pp. 55-58, available at: http://ijrls.in/wp-content/uploads/2016/08/ICT-Skills-for-LIS-Professional-in-the-Digital-Environment.pdf (accessed 1 February 2017).

Odongo, T.A. (2011), "An assessment of ICT adoption in Kenyan academic libraries: a case study of University of Nairobi libraries, (Masters Dissertation)", School of Business, University of Nairobi, pp. 1-54, available at: http://erepository.uonbi.ac.ke/bitstream/handle/11295/13374/An%20Assessment%20Of%20Ict%20Adoption%20In%20Kenyan%20Academic%20Libraries%3A%20A%20Case%20Study%20Of%20University%20Of%20Nairobi%20Libraries%20.pdf?sequence=4 (accessed 5 August 2016).

Okiy, R.B. (2010), Globalization and ICT in Academic Libraries in Nigeria: The Way Forward, Library Philosophy and Practice, Paper 501:1-11, available at: http://digitalcommons.unl.edu/libphilprac/501 (accessed 19 September 2017).

Ondari-Okemwa, E. (2000), "Training needs of practicing professional librarians in the Kenyan public university libraries: a critical analysis", Library Management, Vol. 21 No. 5, pp. 257-268, doi: 10.1108/01435120010324969.

Pawar, S.S. and Kaur, M.P. (2015), "Need of change in library and information science education in India and skills in the changing Knowledge Era: a study", Paper presented at the Sixteenth Congress of Southeast Asian Librarians (CONSAL) Meeting and General Conference, ASEAN Aspirations: Libraries for Sustainable Development, 11-13 June 2015, Bangkok, pp. 1-10, available at: http://myrepositori.pnm.gov.my/bitstream/123456789/4195/1/CONSALXVI_SarbjeetSinghPawar.pdf (accessed 10 January 2017).

Rukwaro, W.R. and Bii, H. (2016), "Library and information science (LIS) education and training in Kenya: emergence, evolution, challenges and opportunities", International Journal of Library and Information Science, Vol. 8 No. 2, pp. 11-18, available at: http://www.academicjournals.org/journal/IJLIS/article-full-text-pdf/F74779A57215 (accessed 16 December 2016).

Safahieh, H. and Asemi, A. (2010), "Computer literacy skills of librarians: a case study of Isfahan University Libraries, Iran", The Electronic Library, Vol. 28 No. 1, pp. 89-99, doi: 10.1108/02640471011023397.

Shiholo, B.M. and Ocholla, D.N. (2003), "Changing trends in training needs for information professionals in Kenya", LIBRES: Library and Information Science Research, Vol. 13 No. 1, pp. 1-12, available at: http://library.nust.ac.zw/gsdl/collect/toolbox/import/Changing%20Trends%20In%20Training%20Needs%20For%20Information%20Professionals.pdf (accessed 16 December 2016).

Thanuskodi, S. (2011), "ICT literacy among library professionals in the engineering college libraries of Tamil Nadu: an analytical study", International Journal of Digital Library Services, Vol. 1 No. 2, pp. 131-141, available at: http://www.ijodls.in/uploads/3/6/0/3/3603729/thanuskodi12_131-143.pdf (accessed 19 December 2016).

Tzoc, E. and Millard, J. (2011), "Technical skills for new digital librarians", Library Hi Tech News, Vol. 28 No. 8, pp. 11-15, available at: http://41.89.26.5:2052/doi/pdfplus/10.1108/07419051111187851 (accessed 25 September 2017).

Ugboma, M. (2008), “Information and communication literacy among practicing librarians in Delta State”, Information Manager, Vol. 6 No. 1, pp. 1-7, available at: https://www-ajol-info.uplib.idm.oclc.org/index.php/tim/article/viewFile/27224/4976 (accessed 13 September 2016).

World Ranking Guide (2011), “Library school rankings”, available at: http://worldranking.blogspot.com/2009/06/library-school-rankings.html (accessed 22 January 2017).

Further reading

Nyamboga, C.M., Asundi, A.Y., Kemparaju, T.D. and Pawinun, P. (2004), “Required skills of information technologies for library and information professionals: a case of university libraries in Kenya”, Proceedings of the International Conference on Digital Libraries, 24-27 February 2000, New Delhi, pp. 749-763.

Satpathy, S.K. and Maharana, R.K. (2011), “ICT skills of LIS professionals in engineering institutions of Orissa, India: a case study”, Library Philosophy and Practice, Paper 627, pp. 1-12, available at: http://digitalcommons.unl.edu/libphilprac/627 (accessed 27 July 2016).