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Technology-related continuing professional development activities in supporting digital transformation in academic libraries in Uganda

Sarah Nakaziba [1], Patrick Ngulube [2]

[1]*Aga Khan University, Kampala, Uganda*
[2]*Department of Interdisciplinary Research and Postgraduate Studies, University of South Africa, Pretoria, South Africa*

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* Correspondence:
Sarah Nakaziba

E-mail:
saranakaziba@gmail.com

Abstract

Background of the study: To survive and thrive in a technologically advanced academic setting, librarians working in academic libraries need to revamp their competencies and knowledge through technology-rated continuing professional development.

Purpose: The purpose of this study was to examine the role of technology-related continuing professional development activities in enhancing digital transformation in selected Ugandan academic libraries.

Method: A convergent parallel mixed methods design was used to collect qualitative and quantitative data from six universities in Uganda. Qualitative data were obtained from six University Librarians working in these universities, and quantitative data were collected from 76 librarians with a minimum degree-level qualification.

Findings: The findings revealed that the librarians who had gained digital competencies from attending technology-related CPD activities had implemented or supported various digital transformations in their institutions. Thus, concluding that technology-related CPDs have a role in implementing digital competencies in academic libraries.

Conclusion: The findings further revealed several challenges affecting the implementation of digital transformation, such as a lack of awareness of digital technologies, insufficient ICT infrastructure, limited staff, librarians' failure to understand their changing roles, limited funding, absence of relevant policies or frameworks, and limited management support.

Keywords: CPD, staff training, staff development, university libraries in Uganda, Academic libraries

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Introduction

Information and communication technology (ICT) advancements have resulted in the rapid transformation of academic libraries (Bawack, 2019). These advancements have led to vast amounts of digital information and an increased number of internet users with diverse and evolving needs. Therefore, academic libraries should come up with creative ways to connect with their users (Otike & Barát, 2021). Digital transformation within academic libraries is pushed by the desire to satisfy library users' evolving information-seeking habits and needs. Thus, maintaining their relevance, bringing value to the institution, and enhancing professional agility.

To deal with advancing technologies in universities and to survive in the ever-changing information environment, librarians need to build their capacities through participation in relevant staff development activities (Cobblah & Van der Walt, 2017). These activities are important for enhancing the acquisition of emerging technology skills. Librarians in Uganda, just like their counterparts from other African countries, have engaged in various technology-related CPDs. However, most academic libraries on the African continent still operate in the old-fashioned style because of various reasons, among which is the unskilled staff (Nakaziba & Ngulube, 2024; Otike & Barát, 2021).

To survive and thrive in a technologically advanced academic setting, academic librarians need to revamp their skills and knowledge through technology-rated continuing professional development (CPD). A comprehensive literature search revealed a few CPD studies in Uganda, and these focused on the challenges hindering librarians from participating in CPD activities (Kacunguzi & Samuel, 2017; Kigongo-Bukenya, 1999; Lutaaya, 2015; Namaganda, 2019). However, there were no existing studies on the role of technology-related CPD in the digital transformation of academic libraries in Uganda. There was a need to conduct an empirical study in a field that has not received much attention. Therefore, this study aimed to examine the role of technology-related CPD activities regarding the implementation of digital transformation in the selected academic libraries in Uganda. The research questions include: Which digital competencies have librarians working in the selected Ugandan academic libraries acquired from attending technology-related CPD activities? To what extent were librarians able to apply the acquired digital competencies to influence the digital transformation of the selected Ugandan academic libraries? Which technologies were implemented or supported as a result of the attained digital competencies of the selected Ugandan academic libraries?

Literature Review

Five years after earning a degree, the skills and knowledge acquired at any educational institution become obsolete. Coupled with the continually changing technological environment in the LIS field, this calls for continuous engagement with technology-related CPD activities (Hamid & Soroya, 2015). The vital role technology-related CPD plays in the digital transformation of academic libraries is indisputable. To deal with advancing technologies in universities, librarians need to build their capacities through participation in relevant staff development activities (Cobblah & Van der Walt, 2017). These activities are important for enhancing the acquisition of emerging technology skills. Below is a discussion of how technology-related CPD activities impacted the implementation of technological trends in academic libraries.

Carnegie CPD programme

A four-week residential CPD programme for librarians in sub-Saharan Africa was organised by the University of Pretoria's Department of Information Science in partnership

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with the Carnegie Corporation of New York. The course covered mobile technologies, virtual research environments, digitisation, social media, RDM, and cloud computing. These were geared towards enhancing academic librarians' skills to ably work with LIS's trending technologies (University of Pretoria, 2014). Aiyebelehin (2018) assessed whether the alumni of this CPD programme were equipped with the trending technological skills to effect digital transformation in their universities. The findings revealed that the Carnegie CPD training objectives were realised; all participants had acquired ICT skills in social media, mobile technologies, and cloud computing. The study further reported that 70% of participants had made efforts to implement these ICT skills in their institutions.

Furthermore, in assessing the impact of attending the Carnegie CPD on the application of ICT skills, showed that 91.3% of participants had implemented some of the emerging technologies taught during this programme. However, in both studies, it was revealed that participants who had failed to implement these technologies cited an unconducive environment, such as a lack of technical equipment, limited finances, low bandwidth and unstable power supply (Aiyebelehin, 2018; Lamptey et al., 2016). Therefore, although participants in this technology-related CPD could implement digital technologies in their libraries. However, the unconducive environment in their institutions was a limiting factor.

Mortenson Center for International Library Programme

To further global education, understanding, and peace, the Mortenson Center for International Library Program was established in 1989 to fortify relationships between libraries and librarians around the world. Librarians from 90 non-US nations participated in this professional development program. Through networks, library visits, and expert-led workshops and conferences, participants were introduced to current issues and trends in the LIS sector (Mortenson Center for International Library Programs, 2020).

The participants from Nigeria who attended the Mortenson Center for International Library Programme were reported to have acquired IT skills. These skills translated into the implementation of social media and IRs to increase the institutions' visibility (Anunobi et al., 2017). In addition, that study reported that several librarians had implemented IL programmes to enhance the sharing of skills and knowledge. Engaging in the CPD activity improved their competencies in conducting research and presenting papers, thus increasing their visibility and that of their institutions. This showed that the institutions of participating librarians had also gained from the programme; they had become more ICT compliant (Anunobi et al., 2017).

Jay Jordan IFLA/Online Computer Library Center (OCLC) Fellowship

The Jay Jordan OCLC Fellowship is a partnership between the IFLA and the OCLC. The fellowship was formed in 1999 in Bangkok, Thailand at the IFLA General Conference, to provide early-career CPD training for LIS from lower-resource countries. Every year, five selected participants are exposed to a broad spectrum of technologies, global library cooperations and library operations. They also have the opportunity to visit some libraries in the United States. This programme has so far welcomed 100 participants from 40 countries (Jay Jordan IFLA/OCLC Early Career Development Fellowship Program, 2021).

In examining the contribution of the Jay Jordan IFLA/OCLC programme to building strong library communities and partnerships, Kaddu (2016) revealed that the fellows had gained new knowledge and skills regarding new/trending technologies that the programme had exposed them to. They had implemented technologies in their institutions, and taken up positions in library associations, networking, mentoring young professionals, presenting at conferences, and furthering their studies (Lensenmayer & Needham, 2011). Some fellows shared that they had initiated digital repositories in their institutions and rolled out digital

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content management (Kaddu, 2016). These revelations showed that the programme had played a role in enhancing participating librarians' skills.

Appropriate and relevant training will improve staff performance. Therefore, librarians need to engage in technology-related CPD opportunities to keep up with trends in LIS thus improving service delivery. Similarly, Adanu (2007b) and Corcoran and McGuinness (2014) confirmed that involvement in CPD is paid in terms of increased competencies and career advancement, and helps librarians to keep track of trends in the profession. This type of CPD is geared towards enabling librarians to survive in the continuously changing information environment. Engagement in various CPD activities (e.g. conferences, workshops, research, self-learning, and networking), librarians have discovered a means of surviving in their profession (Chanetsa & Ngulube, 2017; Corcoran & McGuinness, 2014).

The present study involved empirical work in a field that has not received much attention, as a comprehensive search of relevant literature revealed no existing studies on the role of technology-related CPD activities in the digital transformation of academic libraries in Uganda. Therefore, this study intended to close this gap in the body of knowledge by examining the role of technology-related CPD activities in supporting digital transformation in the selected academic libraries in Uganda.

Method

Research design

The study adopted a convergent parallel mixed methods research design with qualitative and quantitative data collected roughly at the same time (Morse & Niehaus, 2016). The quantitative data helped in corroborating and validating the qualitative data, thus offering a clear understanding of the phenomenon under study.

Population and sampling

A multilevel sampling technique was applied where the universities were divided into two stratas; public and private universities. Then purposive sampling was applied to select the six oldest public and private universities, these included three private universities; Ndejje University [NDU], Islamic University In Uganda [IUIU], and Uganda Martyrs University [UMU] and three public universities; Makerere University, Kyambogo University, and Mbarara University of Science and Technology [MUST]) (National Council for Higher Education, 2020). The rationale for this selection was that these universities had been in existence longer and were presumed to have well-established structures and programmes, thus expected to offer sufficiently useful information.

Furthermore, the study applied a census where the entire population was surveyed; this included all the librarians working in the six selected university libraries. This is because the population was small and well-defined (Leedy et al., 2019). The population comprised 103 librarians with a minimum qualification of a bachelor's degree. This was because this population was presumed to have opportunities to engage in CPD activities and not forget the roles and duties they perform in the libraries. Lastly, six University Librarians were purposively sampled to provide insight into the phenomenon, given their capacity to influence policy regarding staff training and the implementation of new library trends.

Data collection

Quantitative data were collected from the eligible librarians using self-administered online questionnaires, which took between 20 to 25 minutes to complete. The leaders within these libraries assisted in the distribution of the survey link within their various staff platforms. Additionally, follow-ups were made through phone calls, WhatsApp messages, and physical visits to improve the response rate. Whereas qualitative data were collected from six head

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librarians using individual in-depth interviews. These interviews were conducted between 25th July 2022 to 11th October 2022, and on average, they lasted one hour.

Data analysis

Data analysis for each phase was performed separately, and the results were integrated during an overall interpretation phase to show the relationships between these two data sources, or their divergence and convergence in explaining the research problem. MS Excel and SPSS version 28 were used in analysing the quantitative data, where descriptive statistics were generated in the form of tables, figures, frequencies, and percentages. In the qualitative data, Braun and Clarke (2019) Reflexive Thematic Analysis was adopted to guide the analysis process to assist in interpreting the data. ATLAST ti Version 22 was used to aid the researchers in the analysis.

Ethics

This paper is part of a larger PhD study, which received ethical clearances from the University of South Africa Ethical Research Committee (2408-16-052), The Aids Support Organisation Research Ethical Committee (TASOREC/116/2022-UG-REC-009), and research approval from the Uganda National Council of Science and Technology - UNCST (SS1317ES).

Result and Discussion

A total of 76 (73.8%) of the 103 respondents, eligible librarians with a minimum qualification of a bachelor's degree, completed the online questionnaire. The survey details are shown in Table 1

Table 1: Response rate (questionnaire)

University	Sample size	Frequency (%)
Makerere University	38	28 (27.2)
Kyambogo University	27	17 (16.5)
Islamic University in Uganda	17	14 (13.6)
Mbarara University	8	6 (5.8)
Ndejje University	8	7 (6.8)
Uganda Martyrs University	5	4 (3.9)
Total	103	76 (73.8)

In addition, six University Librarians participated in the individual interviews. Thus, the overall response rate from the questionnaire and individual interviews was 82 (75.2%) out of the expected 109 (100%) participants, which may be considered sufficiently representative. Firstly, the study needed to ascertain whether librarians had attended the technology-related CPDs. Hence, the researchers decided to start by requesting the participating librarians to indicate when they last attended a technology-related CPD activity, as shown in Table 2. This was because this information could have a bearing on acquiring and applying the acquired competencies.

Table 2: When librarians last attended a technology-related CPD activity (N=76)

Variable	Frequency (%)
<2 years	32 (42.1)
2–5 years	24 (31.6)
6–10 years	11 (14.5)
Never	9 (11.8)

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The results (Table 2) showed that 32 (42.1%) librarians had attended technology-related CPD activity in the last 2 years, 24 (31.6%) in the last 2–5 years, and 11 (14.5%) librarians last attended a technology-related CPD activity 6–10 years ago. However, nine (11.8%) respondents had never attended any technology-related CPD activities. Respondents who indicated that they had never attended any technology-related CPD activities were asked to provide reasons that hindered them from participating in these activities, as seen in Table 3.

Table 3: Reasons for not attending technology-related CPD activities (N=9)

Reasons	Frequency (%)
Lack of opportunity	7 (77.8)
Lack of time	1 (11.1)
No clear reason	1 (11.1)

Table 3 shows that the main reason why librarians (n=7, 77.8%) had not participated in any technology-related CPD activities was a lack of opportunity. Only one (11.1%) participant indicated a lack of time as the reason for non-participation, and one (11.1%) librarian did not give any reasons. However, in the individual interviews, some of the University Librarians had the following to comment on the issue of the lack of technology-related CPD opportunities.

> *'...people say there are no opportunities. The opportunities are there…there are also free things which we have not harnessed'.* (UL B; public university)
>
> *'...because we have so many things going on, even on YouTube, so many things are there that people can learn, but people are not interested'.* (UL E; private university)

For those librarians who indicated that they had attended the technology-related CPD activities, we wanted to determine which digital competencies they had acquired and whether they had transformed into the implementation of technologies. Therefore, these librarians were asked to select the digital competencies they had acquired (Table 4).

Table 4: Digital competencies acquired from the technology-related CPD activities (N=67)

Digital competencies	Frequency (%)
Working with an integrated library management system	51 (76.1)
Uploading documents	47 (70.1)
Knowledge and retrieval of electronic resources	38 (56.7)
Digitisation	36 (53.7)
Microsoft Office applications	33 (49.3)
Establishing and managing institutional repositories	32 (47.8)
Application of mobile technologies	28 (42.0)
Metadata development	27 (40.3)
Virtual reference services	26 (38.8)
Managing social network sites	26 (38.8)
Managing open-source software	19 (28.4)
Managing multimedia technology	19 (28.4)
Applying cloud computing	18 (26.9)
Website development	14 (20.9)
Application of copyright issues in the digital environment	14 (20.9)
Designing and developing systems	8 (11.9)

As illustrated in Table 4, the digital competencies acquired by librarians included

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working with an ILMS (n=51, 76.1%), uploading documents (n=47, 70.1%), knowledge and retrieval of electronic resources (n=38, 56.7%), digitisation (n=36, 53.7%), Microsoft Office applications (n=33, 49.3%), establishing and managing IRs (n=32, 47.8%), application of mobile technologies (n=28, 42.0%), metadata development (n=27, 40.3%), managing social media sites (n=26, 38.8%), managing open-source software (n=19, 28.4%), managing multimedia technology (n=19, 28.4%), applying cloud computing (n=18, 26.9%), website development (n=14, 20.9%) and application of copyright issues in the digital environment (n=14, 20.9%). Designing and developing systems (n=8, 11.9%) was the least common competence gained.

We were interested in determining whether librarians who had acquired digital competencies (Table 4) had been able to implement or support any new technologies in their libraries. The findings showed that of the 67 participants, 54 (80.6%) had implemented or supported digital technologies, but the remainder (n=13, 19.4%) had not implemented or supported any technologies.

Furthermore, the interviewed University Librarians also commented about librarians' application of the acquired knowledge.

> *'…the digital library was developed by one staff in Kampala campus. He attended the National Council workshop, which was telling universities to start digital libraries, then he sold the idea to me then I gave him a go ahead he started on it, then people were trained how to use it'.* (UL A; private university)
>
> *'Certainly, they have been able to implement because they go so that we use their skills to do what we need to do…the in-house training helped all of us to implement the library systems…we were able to migrate from the print catalogue to the online catalogue. People digitise, they scan, they do a lot of things, social media...people are doing it. These are new things, so we are proud to do them'.* (UL C; public university)
>
> *'I remember in 2015, we attended the same workshop on institution repositories. It was in Entebbe, so when he came back, I see now the IR is working'.* (UL A; private university)
>
> *'We formed a Pretoria group, so those are the people in-charge of our website, social media page, and making sure they collect information, and it is uploaded…to make sure they use the skills they got'.* (UL C; public university)

For those who indicated that they had not implemented or supported any digital technologies, the researchers sought to clarify the reasons hindering them from applying acquired digital competencies. Of these 13 participants, five indicated that they had failed to apply the newly acquired digital competencies because they lacked management support. Other reasons hindering application were inadequate ICT infrastructure (n=2), lack of motivation (n=2) to push them to apply and the technologies were already implemented (n=2). One participant did not wish to share reasons for the non-application of digital competencies. These findings are shown in Table 5.

Table 5: Reasons for not applying the acquired digital competencies (N=13)

Reasons for non-application	Frequency (%)
Lack of management support	5 (41.7)
Inadequate ICT infrastructure	2 (16.7)
Already implemented	2 (16.7)
Lack of motivation	2 (16.7)
No reason provided	1 (8.3)

The findings showed that University Librarians had emphasized the need for CPD

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organisers to involve them in the selection of librarians who would benefit from the training. An example of a typical response from a University Librarian is as follows.

> *'…the library administration was never part of this kind of scenario. So, the expectation that because UP has trained people they should come back here, me I overhaul my structure!…when you advertise, I don't know what you are adverting…for training? A person coming from department X when the training is for Y, so definitely when they go back, they will not demonstrate the skills they have picked. So, they should first find out background information on these people…is there a nexus where she is and this training, do they align that when they pick the skills, are they actually going to be applied when they go back'.* (UL B; public university)

The aspect of inadequate ICT infrastructure was also discussed in the interviews.

> *'…if a training is about digital skills, you train me, and I go back to where there is nothing to practice on. So, if that aspect could also be factored into these projects, if you are interested in imparting digital skills, probably you could also equip in terms of equipment…to get these people started when they get home. Maybe some people go home and there is nothing'.* (UL B; public university)

Having established that the majority (n=54, 80.6%) librarians who had acquired digital competencies from the technology-related CPDs had either implemented or supported digital technologies, the researchers were interested in finding out which technologies these were. They are presented in Figure 1.

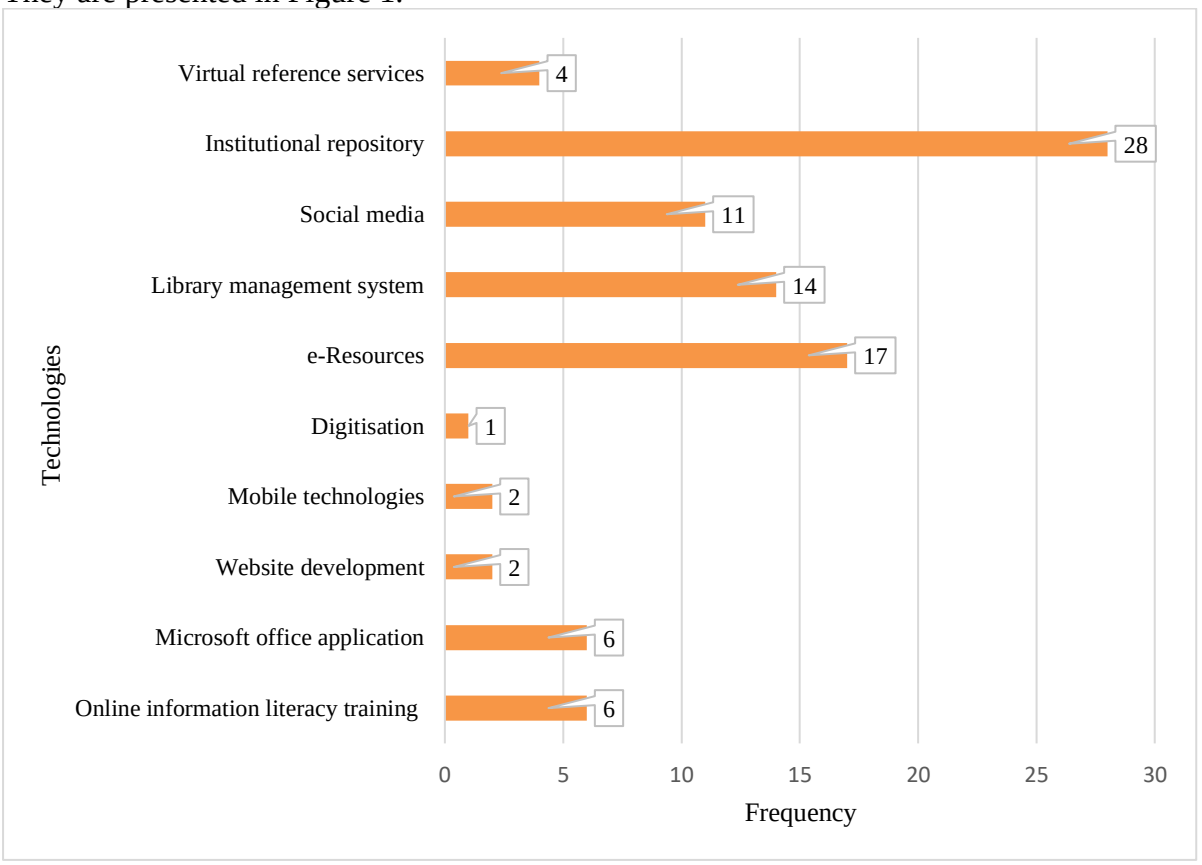

Figure 1: Technologies implemented or supported (N=54)

As shown in Figure 1, half of the librarians (n=28, 51.9%) who had attended technology-related CPD activities had been able to implement or support IRs. Some librarians

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(n=17, 31.5%) had implemented e-resources, 14 (25.9%) had implemented LMS and 11 (20.4%) listed the implementation of social media. The least implemented technologies were online IL (n=6, 11.1%), Microsoft Office applications (n=6, 11.1%), virtual reference services (n=4, 7.4), mobile technologies (n=2, 3.7%), website development (n=2, 3.7%), and digitisation (n=1, 1.9%).

Data from the University Librarians' individual interviews showed that librarians had implemented social media, IRs, websites, e-resources, LMS, and remote access.

> *'Yes, so many things, creation of Facebook page…WhatsApp group for our users such that we keep constant communication'.* (UL E; private university)
>
> *'We have Twitter, we have Facebook, we have all those things, and we try to publicise them as much as possible.'* (UL F; private university)
>
> *'We have the MyLoft where we have the electronic resources, then we have them from A to Z, have them in all fashions, open access and...website'.* (UL F; private university)
>
> *'People digitise, you know, they scan, they do a lot of things'.* (UL C; public university)
>
> *'…we have a library management system, Koha, and it is running a catalogue module and a circulation module and patron administration module, the serials management'.* (UL F; private university)

Discussion

The study indicated that 11.8% of the respondents had never attended any technology-related CPD activities, of which the majority indicated lack of opportunity was the main reason for non-attendance. However, this reasoning was refuted by the interviewed University Librarians, who mentioned that opportunities did exist, especially with the explosion of the Internet, where free courses can be accessed. It was unfortunate that these librarians working in an academic environment had not attended any technology-related CPD activities in this era, where the only way they can survive and ably meet today's users' information needs is by acquiring competencies related to emerging technologies. A reason for non-attendance could be that they may not be aware of the existence of these technology-related CPD activities. This observation was consistent with Adanu (2007a), who noted that someone's awareness of CPD would greatly influence their involvement in such activity.

Digital competencies are skills required by librarians to administer library services and infrastructure and effectively operate in the changing digital environment (Chinien & Boutin, 2011). Participating in a variety of technology-related CPD activities, including seminars, conferences, on-the-job training, online tutorials and self-teaching, can help librarians develop these competencies. For those who had attended technology-related CPD activities and had attained digital competencies, we needed to clarify whether they had been able to implement or support any new technologies in their libraries. The majority (n=54, 80.6%) indicated that they had implemented or supported digital technologies. This indicates that the competencies and knowledge gained from technology-related CPDs had an impact on the acquisition of digital trends within selected academic libraries in Uganda. This was confirmed by the university librarians, who mentioned that some librarians who participated in technology-related CPD activities had implemented some digital transformations. The findings showed that most academic libraries had implemented technologies resulting from attending technology-related CPDs, and these included IR, e-resources, ILMS, social media, and MS Applications, among others. This also goes further to show the role of technology-related CPDs in the implementation of digital transformation in academic libraries. When staff attain the skills through the various CPD activities, they are likely to implement or support digital transformation. This was echoed by Bowen-Chang and Hosein (2019), who noted that through

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CPD, librarians are given an opportunity to update the knowledge and skills required to remain relevant in technologically advanced academic settings.

These results supported the findings of Aiyebelehin (2018) who assessed whether alumni of the University of Pretoria Carnegie CPD Programme had been equipped with the trending technological skills to effect digital transformation in their universities. These two studies reported that 70% and 91.3% of the participants, respectively, had tried to implement the acquired digital skills in their institutions. Similarly, in assessing the impact of the Mortenson Center for International Library Programmes on Nigerian institutions Anunobi et al. (2017), reported that they implement the acquired IT skills and knowledge in their institutions and disseminate them through training, networking, and mentoring. These findings showed that librarians who have been able to acquire digital competencies are capable of implementing some digital transformations in their libraries. This was consistent with Adanu (2007b:303) and Corcoran and McGuinness (2014:192) who attested that participation in CPD pays in terms of improved skills and job promotion, and helps librarians to keep track of the trends in their profession.

Moreover, a surprising finding indicated that only 26 (38.8%) librarians had attained competencies in managing social media sites. This was further evidenced by the University Librarians, who noted that the social media presence of their libraries was low. They believed that their staff did not have the capacity and time to maintain social media accounts. Therefore, some university librarians suggested the need for libraries to hire an expert in social media to run their accounts. This finding was worrying given the explosion of social media applications and their low implementation cost. Howard et al. (2018) noted that because of the increasing popularity of social media among young adults, academic libraries should enhance their presence on several platforms. Thus, finding the library users in their 'favourite' virtual settings (Trucks, 2019). Consequently, university libraries have realised the critical role that social media plays in interacting and engaging with their customers to raise their visibility. They are using the social media spaces to market their resources and have implemented services, thereby revolutionising service delivery (Okoroma, 2017). The acquisition of competencies in the application and management of social media would help Uganda's academic libraries to fully tap into the opportunities that their counterparts around the world are enjoying. Furthermore, another interesting finding was that the Fourth Industrial Revolution (4IR) was not implemented in any of the participating libraries. This may be attributed to inadequate resources, staff and finances. Research has indicated that African libraries have lagged in implementing 4IR, citing barriers like limited training opportunities, inadequate staff, and the cost of technologies (Akeriwa et al., 2015; Jain & Akakandelwa, 2016; Odeyemi, 2019; Tella et al., 2020). Yet, libraries that have successfully implemented 4IR tools are more intuitive and accessible.

Furthermore, the librarians indicated a lack of management support as the main reason for failure to support or implement any digital transformation. These findings were supported by the six university librarians who emphasised the need to engage them in the identification of CPD trainees to make the training more impactful within the library. The university librarians believed that they would be able to identify the ideal staff to attend any given training so that at the end of the training, they would have the opportunity to implement the acquired knowledge and skills. This issue was also raised in discussions about the preferred CPD learning strategies for librarians. This was a significant finding of this study; the implication is that for CPD to be impactful, library management should be involved during the planning stage and selection of participants. Matt et al. (2015) discussed the importance of top management's involvement in the entire digital transformation process. However, further research is required to fill the gap of the lack of extant literature on this issue in academic libraries.

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Conclusion

In conclusion, this study reported that the librarians who had gained digital competencies from technology-related CPD activities were able to implement or support various digital transformations in their libraries. The technologies included IR, e-resources, LMS, and virtual reference services, among others. Thus, technology-related CPDs are vital in implementing digital competencies within academic libraries. The findings further revealed several hindrances to digital transformation, such as the non-involvement of the library management in the selection of CPD trainees, limited funding, failure of librarians to recognise their changing roles, limited awareness regarding the new library technologies, inadequate policies and frameworks, few staff, and insufficient ICT infrastructure. The study findings will add to the body of knowledge regarding the role of technology-rated CPDs in enhancing digital implementation, guide university libraries in the formulation of policies on staff development, and present some of the technologies that have been implemented in libraries, which may act as a benchmark for others. However, the limitation of this study was the selection criteria, where only institutions that had been in existence for 10 years or more were included; you may find that these findings may not be generalised to those institutions that were less than 10 years. Therefore, there is a need to research the role of technology-related CPDs in those institutions with less than 10 years of existence.

Recommendations

CPD planners and trainers should endeavour to involve the library management in the planning from the onset. The managers will share with the trainers their needs and help identify the right people to participate in the CPD activities, who will, in turn, implement the acquired knowledge and skills after the training.

A university library's readiness is a key aspect of implementing digital transformation. Therefore, this study recommends that university libraries' ability to implement digital transformation is demonstrated by providing support in the form of financial resources and equipment, policies, as well as librarians who are technically competent to implement, use, and manage emerging technology.

For those digital transformations that were not implemented or were poorly implemented, the librarians should take advantage of the available CPD opportunities and also apply self-directed learning to acquire competencies and skills to facilitate the implementation of technologies in their libraries.

Furthermore, the library management or leaders should formulate strategic plans, make decisions on which technologies to adopt, and facilitate the technology implementation. Also, libraries need to benchmark their counterparts to guide their decision regarding which technologies to implement.

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Authors' Contributions

Sarah Nakaziba: Conceptualization, methodology, investigation, and writing the original draft. Patrick Ngulube: Supervision, conceptualization, reviewing, and editing manuscript.

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Conflict of Interest

All authors have no conflict of interest related to this study.

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