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Evaluating Digital Competencies for Enhancing Library Services: Insights from Tanzanian Academic Libraries

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ABSTRACT

This study aimed to evaluate the digital skills essential for enhancing library services and identifying the challenges librarians face in Tanzania. A convenience sample of 71 Tanzania Library and Information Association members participated in the study. Data were collected through an online Google Forms survey and analyzed using SPSS version 20. The results revealed digital skills necessary for effective library operations, including cataloging, AI implementation, online research, and database navigation. However, significant challenges emerged, such as limited access to training, budget constraints, and staff resistance to adopting new technologies. The findings indicate that while participants demonstrated proficiency in digital tools and AI, substantial barriers hindered their ability to leverage these skills in practice fully. The study concludes an urgent need for coordinated efforts to enhance digital literacy among librarians, with stakeholders encouraged to develop targeted training initiatives that address the identified challenges. Recommendations include implementing strategic training programs, providing managerial support for skill acquisition, and securing government backing for digital integration in libraries. These measures are crucial for empowering librarians to meet the evolving demands of library users in the digital age.

KEYWORDS

Challenges; digital competency; digital skills; librarians; library services; technology integration

Introduction

In recent years, academic libraries in developing countries, particularly in Tanzania, have faced challenges in attracting and retaining users, leading to fluctuating patterns in physical library attendance (Kawina & Mehrotra, 2023; Mubofu & Malekani, 2019). This trend is most evident in the use of physical spaces and print collections, where library usage peaks during academic milestones such as examinations and assignment deadlines. During these periods, students and faculty turn to the library to access physical resources and prepare for assessments (Chugh & Pervez, 2024; Sharma & Gupta, 2022). Students typically seek materials to study and complete assignments, while faculty members use the library for reference materials needed in designing examinations and assignments. Outside of these peak periods, however, there is a noticeable decline in the number of patrons utilizing physical library resources. This decline is partly due

to changing user needs and the increasing availability of alternative information sources online, such as e-journals and digital databases (Kawina & Mehrotra, 2023; Nurohman, 2022).

The rise of digital information sources has transformed the landscape of academic libraries, enabling users to access a vast array of resources remotely. This shift aligns with the growing reliance on digital platforms for academic purposes, such as completing assignments, conducting research, and developing proposals (Vrana, 2011). However, while access to digital resources has expanded, the ability of library users to effectively search, evaluate, and utilize these resources varies significantly. Many users, particularly students, may lack the digital literacy required to critically assess the quality and relevance of the information they retrieve, which can hinder their academic work (Muhammad et al., 2019).

Given this context, it is increasingly essential for library staff to develop advanced digital skills.

By doing so, they can guide patrons more effectively in navigating digital platforms, retrieving credible information, and building their digital literacy. This proactive support can also help libraries sustain and increase user engagement by enhancing the quality and relevance of library services in a digital age. This study evaluates the digital skills essential for enhancing library services and identifying the challenges faced by librarians in Tanzania

Literature review

The literature on digital skills in library services underscores the growing need for libraries to adapt to an increasingly digital environment to remain effective in serving patrons. Scholars have addressed various aspects of digital competencies, including their benefits for librarians and library users, challenges in acquiring these skills, and the broader implications for library service delivery. However, existing studies reveal significant gaps, particularly in understanding the role of digital skills in enhancing library services within region-specific contexts, such as Tanzania. This review highlights the current knowledge landscape, identifies gaps, and positions the current study as an effort to address these limitations.

Digital skills for enhancing library services

Digital skills are essential for librarians to meet the evolving demands of library patrons in today's technology-driven society. These skills enable librarians to efficiently use Information and Communication Technologies (ICTs) to support users' information needs, provide digital literacy instruction, and manage digital resources (Khumalo, 2022). For instance, Zafirah (2022) underscores that as the volume of information in cyberspace grows exponentially, librarians must continuously update their digital literacy skills to assist users effectively. Additionally, studies show that digital competencies allow librarians to handle digital collections better, manage digital information systems, and support research and educational needs in academic libraries (Cezar, 2022; Maryna, 2022). However, the implementation and prioritization of digital skills vary widely

across regions and institutions, influenced by factors such as resource availability, administrative support, and technological infrastructure.

In academic libraries, digital skills create supportive environments for both distance and traditional learners. The ability to use and manage digital resources is increasingly important, particularly as libraries cater to distance education and online learning. By integrating digital skills into their services, libraries can transform into digital hubs that cater to users' needs in real-time and expand their reach beyond physical boundaries (Owusu-Ansah & Rodrigues, 2023). This transformation is crucial for supporting students and faculty and positioning libraries as essential stakeholders in digital education and lifelong learning. Cabfilan (2024) notes that students primarily access information through online subscriptions or personal Internet connections, indicating a need for basic digital skills to navigate online databases and utilize digital resources effectively.

In developed countries, librarians have taken on roles that include teaching digital literacy skills to users and embedding digital resources into educational curricula, significantly increasing user engagement and resource utilization (Faten et al., 2021). However, libraries in developing countries often face challenges in implementing such roles, emphasizing the importance of research on digital competencies in these regions. Studies reveal that digital skills among librarians are crucial for promoting technological innovation within libraries. As the digital landscape evolves, librarians must adapt to emerging technologies, including digital archives, open-access resources, and information management systems that enhance user experience. Libraries are exploring ways to integrate these new technologies, as evidenced by studies showing that librarians' digital competencies can drive technological innovation within library systems (Guzenok & Anastasia, 2022). Developing digital skills among staff is thus a priority to maintain and expand library services. The current study builds on this literature by examining how digital skills can be cultivated and applied within Tanzanian libraries to improve service delivery, especially in academic contexts.

Challenges faced in acquiring and implementing digital skills in libraries

Despite the evident need for digital skills in libraries, acquiring and implementing these skills presents several challenges. Libraries in developing countries face significant barriers due to limited funding, outdated infrastructure, and a lack of access to training programs. Andrey (2023) highlights that acquiring digital competencies requires institutional commitment and resources, often scarce in public and academic libraries. In many cases, library staff do not receive adequate training in digital skills, limiting their ability to support digital resources and online research tools. Cabfilan (2024) highlights that many students experience slow Internet speeds at the university, hindering their ability to access online information. This situation underscores the importance of library staff equipping students with digital literacy to assist them in troubleshooting connectivity issues and finding alternative ways to access information.

Additionally, Karen et al. (2022) discuss the tension between national digital policies and local needs in some regions, where libraries may struggle to meet digital competency requirements due to a mismatch between policy expectations and available resources. A common barrier to digital skills implementation is the lack of a unified framework or standard for digital competencies in libraries. Different regions and institutions often define digital skills requirements differently, leading to inconsistencies in skill acquisition and application across library systems (Guzenok & Anastasia, 2022). Without standardized guidelines, libraries may face difficulties developing digital competencies that align with best practices, especially when integrating new digital services and resources. Furthermore, the emergence of new digital professions within libraries requires a higher level of digital proficiency, which many libraries are currently ill-equipped to support (Maryna, 2022).

Cultural and institutional challenges also play a role in limiting digital skill acquisition. In some cases, library staff may resist adopting new digital tools or lack motivation to pursue digital literacy training due to limited incentives or professional

support. Khan (2020) identifies several challenges librarians face in Pakistan, including poor internet infrastructure, limited user demand for digital services, and a lack of interest in digital competencies among library staff. Factors such as unauthorized access, data privacy concerns, and managing large volumes of digital information further complicate integrating digital skills into library services (Karthic & Ayisha, 2019). These challenges emphasize the importance of targeted research on how libraries, particularly in resource-constrained settings, can overcome obstacles to digital skill development and effectively implement these skills to enhance library service delivery.

Rationale for the current study

Although considerable research exists on digital issues within libraries (Faten et al., 2021; Owusu-Ansah & Rodrigues, 2023; Khumalo, 2022; Williams, 2023), none of these studies focus specifically on libraries in Tanzania. There is, however, limited insight into how digital skills specifically impact library services in Tanzanian academic libraries. Focusing on Tanzanian academic libraries, this research contributes to a more nuanced understanding of digital competencies in libraries within Sub-Saharan Africa. While previous studies have examined digital skill development in various contexts, such as Faten et al. (2021) work on technology acceptance in Jordanian academic libraries and Khumalo's (2022) study on digital literacy instruction in academic libraries in KwaZulu-Natal, there is limited research addressing the unique socio-economic and technological conditions affecting libraries in Tanzania. This study builds upon existing research by examining how digital skills impact library service quality in Tanzania and proposing context-appropriate solutions for skill development that can enhance library services. In doing so, it provides valuable insights that can inform digital skills development in libraries in Tanzania and other regions facing similar challenges.

Objective of the study

The study aims to evaluate the role of digital skills in enhancing library services, focusing on

identifying influences and the challenges librarians encounter in the digital landscape.

Specific objectives

The following specific objectives guide this study:

- i. To identify the digital skills necessary for improving and enhancing library services in today's information-rich environment.
- ii. To examine the challenges librarians face in acquiring and applying digital skills to improve the quality and accessibility of library services.

Methodology

Research approach and design

This study employed a quantitative research approach. Through structured, numerical data collection, this approach allowed for a precise evaluation of librarians' digital competencies and the impact of these skills on library service quality, aligning with Creswell and Creswell (2018) emphasis on objective, data-driven analysis.

A survey-based design was chosen to gather quantitative data from librarians, with structured questionnaires to capture information about digital skill levels, use of digital tools, and challenges in digital skill acquisition and implementation (Creswell & Creswell, 2018). Additionally, a case study element was incorporated to delve into the practical application of these skills in various library settings, thereby contextualizing the survey findings. This combination enabled a more nuanced analysis by highlighting librarians' specific, contextual challenges, complementing the broader statistical insights with a deeper, situational understanding of digital skill use within distinct library environments (Yin, 2014).

Participants

The study involved Tanzanian librarians working in various private and government organizations and the Tanzania Library and Information Association (TLA) members. It was imperative to involve these people because they are practising librarianship activities and possess valuable insights and experiences regarding the challenges and opportunities related to digital skills in

library settings. Additionally, as members of the TLA, they are part of a professional community that fosters collaboration, knowledge sharing, and professional development within Tanzania's library and information field. Involving Tanzanian librarians who are active members of the TLA, the study aimed to capture a diverse range of perspectives and experiences, ensuring the findings are relevant and applicable to the broader library community in the country.

Sample size and sampling procedure

The study comprised 71 librarians who volunteered to complete the survey and were active members of the TLA WhatsApp group. Convenience sampling was used to support the study's objectives and the particular characteristics of the intended audience. This technique allows researchers to add participants based on availability and readiness (Etikan et al., 2016). The researchers made themselves available to librarians *via* the TLA WhatsApp group, identifying them as crucial participants with personal knowledge of library operations and developing digital skills, making engaging in the study easier.

Data collection methods

The study employed an online survey to collect data from librarians. This survey was created using Google Forms and then distributed within the official WhatsApp group of the TLA, where all registered and active members regularly exchange knowledge and skills. An online survey efficiently facilitated data collection from librarians across various locations. The survey link was accessible for two weeks, allowing ample time for all members to participate. The survey link was closed in preparation for data analysis after this duration.

Data analysis and presentation

The online survey data was descriptively analyzed using the Statistical Package for Social Science (SPSS) IBM version 20 computer application. This software made it easier to analyze the data's central tendencies, distributions, and other

descriptive statistics. The final results were provided in figures to aid comprehension and visualization of critical findings. This method ensured that the study's findings were successfully communicated and easily understood by readers.

Results and discussion

The findings of this study have been organized according to the themes from the specific objectives to allow the reader to easily link the study with the results obtained from the field.

Digital skills for enhancing library services

Under this objective, the study participants were asked three questions, as explained in detail in the following subsections:

Librarians proficiency in utilising digital tools, technologies, and artificial intelligence

The analysis of respondents' proficiency in utilizing digital tools, technologies, and artificial intelligence revealed a varied distribution among the surveyed individuals. Among them, 34 (47.9%) reported advanced proficiency, 24 (33.8%) indicated intermediate proficiency and 12 (16.9%) identified themselves as beginners. Only one respondent, equivalent to 1.4%, reported no proficiency. These findings provide a snapshot of the diverse skill levels within the surveyed population, indicating a need for tailored interventions or training programs to address the differing proficiency levels observed, as summarized in Figure 1.

The findings in this study reveal that 47.9% of the participants demonstrated advanced proficiency in using digital tools, technologies, and artificial intelligence, showing a diverse distribution among those surveyed. This suggests that many librarians recognize the importance of possessing digital skills. These results support the argument made by Guzenok and Anastasia (2022), who underscored the significance of librarians' digital skills in improving information service provision in today's libraries. Additionally, the study revealed that 1.4% of the respondents had no proficiency, which indicates



Figure 1. Librarians proficiency ($n = 71$).

that more aggressive training needs to be conducted in the country. Employers must support their employees if they need librarians to improve information services (Muhammad et al., 2019). In 2020, a study conducted by Khan in Pakistan highlighted the prevalence of low digital skills among librarians and the pressing demand for their acquisition. This underscores that the challenge is not limited to librarians in one country but is a multinational issue facing librarians globally. Collaborative efforts through librarianship associations are essential to address this challenge and improve library service provision, particularly in regions like the global south, where libraries often face significant budget constraints.

Digital skills, believed by librarians to be the most essential for improving library services

The research on respondents' perceptions of essential digital skills for improving library services revealed significant findings. Digital cataloguing and classifying systems were rated as the most important by 44 respondents (62%). Furthermore, AI implementation for automated services, online research, and database navigation was mentioned by 33 respondents (46.5%), demonstrating their importance in improving library operations. Other notable abilities found were website design development and management (33.8%), social media management and interaction (29.6%), and data analysis and visualization (20.2%). These findings give excellent guidance for prioritizing digital skills development activities inside libraries, identifying significant areas that can contribute to improved

Table 1. Digital skills for improving library services ($n = 71$).

Skill Area	Frequency (n)	Percentage (%)
Digital cataloguing and classifying systems	44	62
AI implementation for automated services	33	46.5
Online research and database navigation	33	46.5
Website design development and management	24	33.8
Social media management and interaction	21	29.6
Data analysis and visualization	14	20.2

Table 2. Professional development opportunities ($n = 71$).

Training Level	Frequency (n)	Percentage (%)
Some instruction	33	46.5
Significant training	15	21.1
No training	15	21.1
Inadequate training experiences	8	11.3

service delivery and efficiency. For more details, see [Table 1](#).

Respondents disagreed on the essential digital skills necessary for enhancing library services. Nonetheless, the results indicate that the majority, 62%, identified digital cataloguing and classification systems as crucial skills to adopt to elevate their libraries' services. These findings contrast with those of Zafirah (2022), who highlighted the importance of librarians mastering digital literacy to navigate the rapid influx of information in cyberspace. Zafirah emphasized the need for skills facilitating efficient information search to aid library users effectively, ensuring timely service delivery and aligning library resources with users' needs, a concept echoed by the pioneering librarian Sir Ranganathan many years ago, likening libraries to living organisms that evolve to meet users' information requirements.

Professional development opportunities received by librarians to enhance digital skills

The survey participants were asked if they had received formal training or professional development opportunities focused on improving digital skills for library services. The analysis revealed that 33 respondents (46.5%) confirmed obtaining some instruction, while 15 (21.1%) claimed to receive significant training. In contrast, 15 respondents (21.1%) stated they had received no training, while eight (11.3%) reported inadequate training experiences. These findings demonstrate the different levels of access to digital skills training among library professionals, highlighting

both areas of improvement and possible gaps that should be addressed in future professional development activities. These results are summarized in [Table 2](#).

It is attractive from [Table 2](#) that a significant majority, 46.5% of librarians, reported having received professional development opportunities or formal training to enhance their digital skills, aligning with the demands of library users in the current era where traditional library services may fall short. The high citation of this aspect suggests that librarians recognize the benefits of possessing digital skills to enhance their information services. This sentiment resonates with the perspective of Faten et al. (2021), who emphasized the critical role of librarians' digital skills in managing electronic infrastructures and services, ultimately enhancing library services through proficient digital competencies.

Challenges faced in acquiring and implementing digital skills by libraries

The second research objective was guided by three questions discussed in the following subsection.

The challenges faced by libraries in acquiring digital skills among staff members

Respondents were asked to list the main challenges libraries face in helping librarians develop their digital abilities. The investigation revealed numerous significant obstacles, as summarized in [Figure 2](#). According to 26 respondents (36.6%), the main challenge is limited access to training, while 48 respondents (67.6%) cited budget constraints for professional development. Furthermore, staff resistance was mentioned by 25 respondents (35.2%), and inadequate time allotted for training activities was mentioned by 16 respondents (22.5%) as a significant obstacle.

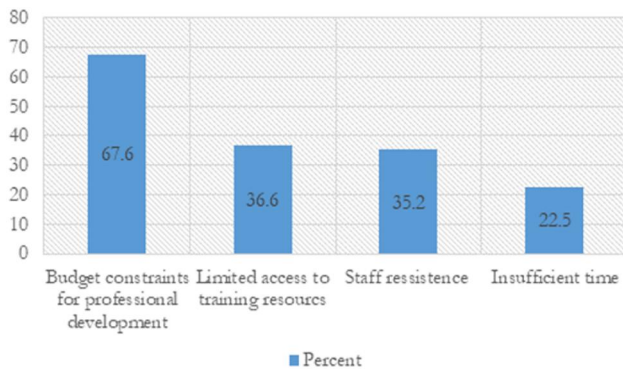


Figure 2. The primary challenges faced by libraries ($n = 71$).

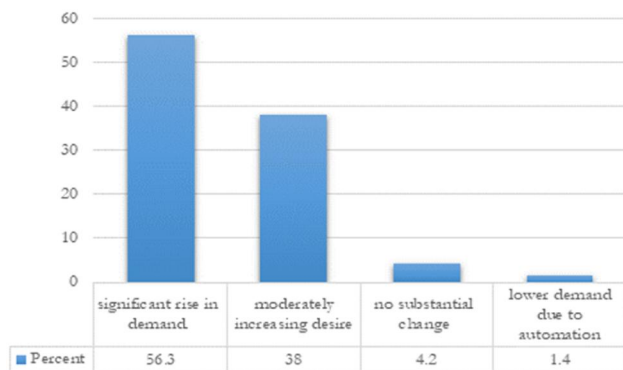


Figure 3. Perceived impact of technological advancements ($n = 71$).

These results highlight the various obstacles, from organizational and attitudinal impediments to budget constraints, that libraries confront to encourage staff members to acquire digital skills. It is imperative to address these obstacles to improve staff competency and guarantee the efficient delivery of digital services in library environments.

It is evident in [Figure 2](#) that while acquiring digital skills, librarians have been encountering many challenges; while the majority (67.6%) identify budget constraints for professional development as the primary challenge, the minority 22.5%, have insufficient time. These findings contrast with the study of [Khan \(2020\)](#), which noted different challenges Pakistani librarians face, including lack of interest, poor internet facilities, and absence of user demand, with budget not being a significant issue. These differences in results may stem from contextual variations. The current study was conducted among members of the Tanzania Library and Information Association,

while the former study was conducted in Pakistan, and only university librarians were recruited to participate. Such contextual differences can significantly influence librarians' challenges in acquiring digital skills.

Perceived impact of technological advancements on the demand for digital skills

Respondents were asked to share their thoughts on the impact of technology improvements on the demand for digital skills in their library settings. Results from the analysis in [Figure 3](#) revealed a range of responses: 27 participants (38%) indicated moderately increasing desire, while 40 participants (56.3%) reported a significant rise in demand. In contrast, only three respondents (4.2%) reported no substantial change in demand. Furthermore, one person (1.4%) mentioned lower demand due to automation. These findings highlight the significant impact of technological advancements on the changing landscape of digital skills requirements within library services, indicating a noticeable shift toward higher demand that necessitates corresponding adjustments in skill acquisition and development strategies.

[Figure 3](#) clearly illustrates that the majority, 56.3%, of the librarians in this study reported a significant increase in demand for digital skills. This finding aligns with [Khan's study \(2020\)](#), which highlighted low digital skills among university librarians in Pakistan and a high demand for skill acquisition. The growing demand for digital skills acquisition among librarians suggests a need for collaborative action among library stakeholders in Tanzania, such as the TLA, TLF, and the Consortium of Tanzania University and Research Libraries (COTUL). These stakeholders should convene to strategise on ways to enhance digital skills acquisition among librarians. In addition to providing centralized training, they could conduct on-site visits to individual libraries to offer assistance. Such support could be offered freely to members of the associations and for a nominal fee to nonmembers, thereby promoting widespread skill development within the library community.

Challenges faced by libraries in integrating digital skills in daily library services operations

The study participants were further asked to assess the extent to which libraries encounter challenges integrating newly acquired digital skills into their daily library service operations. The analysis in Figure 4 delineated varied responses: 41 participants (57.7%) reported facing significant challenges in implementation, while 28 participants (39.4%) acknowledged encountering some challenges but deemed them manageable. In contrast, a minimal proportion of respondents, 2 (2.8%), indicated experiencing minimal challenges in this regard. These findings highlight the complexities involved in effectively integrating newly acquired digital skills into library operations, highlighting the need for targeted strategies and support mechanisms to address implementation hurdles and maximize the benefits of skill acquisition initiatives.

From Figure 4, most respondents (57.7%) identified significant obstacles to integrating digital skills into library operations. These findings highlight the need to adopt specialized programs and support mechanisms to address these problems and effectively improve information service supply. Addressing these barriers is critical to fully realizing the benefits of digital skills acquisition initiatives in library environments. These findings are consistent with those of Virkus et al. (2009), who cited technological, human, and administrative issues as significant concerns when incorporating digital skills into library service provision. Furthermore, according to the study by Mubofu (2024), library clients use library services if there is an availability of digitally skilled personnel and proper information infrastructures to navigate various information databases.

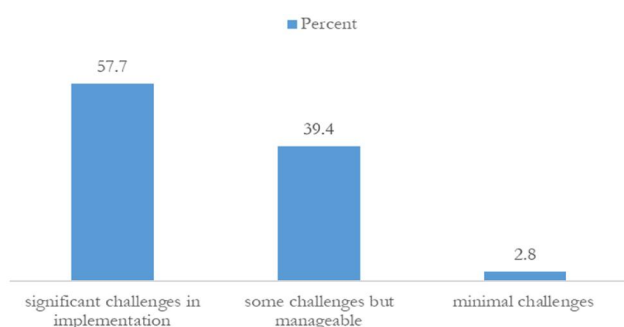


Figure 4. Challenges for integrating digital skills in library operations.

Conclusion

The findings of this study emphasize the varying levels of digital proficiency among librarians, emphasizing the prominence of digital cataloguing, database navigation, and AI-driven automation in enhancing library services. This investigation has illuminated the importance of such digital skills in navigating growing user expectations and increasing the efficiency of information services, especially in developing regions like Tanzania, where the need for modernized library services is paramount. Unlike previous studies examining digital skills in isolated contexts or generalized settings, this study fills a crucial gap in the literature by focusing on the specific challenges Tanzanian librarians face. The limited proficiency among some library staff and the barriers to skill acquisition, such as budgetary limitations, training access, and organizational resistance, indicate a broader need for contextualized, sustainable support strategies for digital literacy in library environments. Addressing these issues is vital for libraries transitioning into modern digital information hubs.

Recommendations

- Implement Strategic Training Initiatives for Library Staff:** To address the varied proficiency levels found, library managers and stakeholders should implement continuous, targeted training programs to equip librarians with essential digital competencies, such as cataloguing, AI, and data analysis skills. Collaborative efforts between library associations, such as the Tanzania Library Association and Consortium of Tanzania University and Research Libraries, could centralize training efforts, reduce costs, and maximize outreach. Training sessions should focus on hands-on, interactive learning formats, with case studies that mirror real-world library challenges, thus allowing librarians to better understand and apply skills in their specific settings.
- Managerial Support in Overcoming Identified Barriers:** Managers and library directors must actively address barriers to digital skill acquisition, particularly by fostering an open,

technology-friendly work environment. To support this, they can allocate specific budget provisions for professional development and incorporate digital skill milestones in staff performance reviews. An implementation strategy could involve a mentorship system within library teams, where digitally proficient staff members support others, bridging skill gaps effectively and encouraging digital engagement. Additionally, institutions can work with local educational institutions to arrange internships or workshops, creating a pipeline for skill development and ongoing professional growth.

- **Government and Institutional Backing for Digital Integration:** Government investment in library digitalization efforts is essential at a national level. Ministries and government agencies should fund digital infrastructure, including stable internet connectivity and accessible digital resources, ensuring that all libraries—whether academic, public, or specialized—are equipped to offer modern information services. By supporting initiatives at the institutional level and recognizing the digital transformation of libraries as a core component of national education and information dissemination goals, the government can empower libraries to serve their patrons effectively in the digital age.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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- a. Advanced
 - b. Intermediate
 - c. Beginner
 - d. Not proficient at all
2. Which digital skills, including AI, are essential for improving library services in the digital age? (Select all that apply)
 - a. Website development and management
 - b. Digital cataloguing and classification systems
 - c. Social media management and engagement
 - d. Data analysis and visualization
 - e. Online research and database navigation
 - f. AI implementation for automated services
 3. Have you received formal training or professional development opportunities for library services to enhance your digital skills, including AI?
 - a. Yes, extensively
 - b. Yes, to some extent
 - c. No, minimal training provided
 - d. No, no training offered

Challenges Faced in Acquiring and Implementing Digital Skills by Libraries:

1. What are the primary challenges faced by libraries in acquiring digital skills among staff members?
 - a. Limited access to training resources
 - b. Budget constraints for professional development
 - c. Staff resistance or lack of interest in digital training
 - d. Insufficient time allocated for training activities
2. How do you perceive the impact of technological advancements on the demand for digital skills in library settings?
 - a. Significantly increased demand
 - b. Moderately increased demand
 - c. No significant change in demand
 - d. Decreased demand due to automation
3. To what extent do libraries face challenges in effectively integrating newly acquired digital skills into their daily operations?
 - a. Significant challenges in implementation
 - b. Some challenges, but manageable
 - c. Minimal challenges experienced
 - d. No challenges encountered

Appendix

Questionnaire for data collection

Digital Skills for Enhancing Library Services:

1. How would you rate your proficiency in utilizing digital tools, technologies, and artificial intelligence (AI) to enhance library services?