INFORMATION AND COMMUNICATION TECHNOLOGIES INFLUENCE ON LIBRARIAN'S SKILLS IN NEPAL

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ABSTRACT

This study explores the impact of Information and Communication Technology (ICT) on librarians employed at five specifically chosen university libraries in Nepal. The research used a structured questionnaire as a data collection tool. The research engaged all five university librarians, and all distributed questionnaires were completed and returned. The study's findings indicate that while university librarians demonstrated competence in fundamental ICT applications, there is a recognized need for additional knowledge acquisition to achieve proficiency in specific ICT tools. Moreover, all surveyed librarians strongly agreed that integrating ICT applications contributes positively to the stature of libraries.

The research also identified several noteworthy challenges faced by university librarians in Nepal, including inadequate staff training, insufficient infrastructure, coordination issues among staff members, and financial constraints. Securing ample funding and implementing professional development programs are crucial to enhancing the effective integration of ICT applications into university libraries. Furthermore, the study emphasizes the importance of university librarians staying well-informed about emerging, cutting-edge technologies. This awareness, coupled with the adoption of advanced technologies in daily operations, is pivotal for advancing library services and enriching the experience of intellectual library users.

Keywords: ICT skills; ICT competencies; University Libraries; Library professionals; Nepal.

1. Introduction

The emergence of the Internet and Information and Communication Technology (ICT) has opened up new avenues for acquiring, managing, and disseminating technical and scientific information. University libraries have effectively harnessed cutting-edge information technologies to enhance and integrate their resources and services, reinforcing their specific roles. However, in Nepal, there is a pressing need for university libraries and the Library and Information Science (LIS) profession to adapt to this dynamic change.

In today's landscape, users possess a heightened level of computer and Internet proficiency for research purposes and anticipate seamless access when needed. Consequently, the LIS profession within university libraries must proactively update their skills and competencies in emerging technologies. This adaptation is essential to

establishing a comprehensive information support system for society.

1.1 Brief Description of Studied Universities in Nepal

(i) Tribhuvan University (TU)

Tribhuvan University (TU) stands for Nepal's pioneering and largest comprehensive central university, with its establishment dating back to 1959 (TU, 2022). At the heart of TU's academic support infrastructure is the Tribhuvan University Central Library (TUCL). Renowned as the foremost library in Nepal, TUCL distinguishes itself through its expansive user base, vast collection, and diverse services. The library's extensive collection boasts an impressive aggregate of over four lakh volumes of documents, complemented by a wealth of electronic resources. In line with its stature as a university library, TUCL offers a spectrum of services tailored to cater to the diverse needs of its users.

TU is Nepal's first and largest extensive central university, established in 1959 (TU, 2022). It has one central library named Tribhuvan University Central Library (TUCL). It is considered the most extensive library in Nepal in terms of users, collection, and services. The library collection has reached more than four lakh volumes of documents and massive e-resources. Being a university library, it provides various services to users (TUCL, 2022).

(ii) Kathmandu University (KU)

Kathmandu University (KU) is a self-governing, autonomous, not-for-profit public institution founded through a parliamentary act in December 1991 (KU, 2023). The university has a central library in Dhulikhel, complemented by seven branch libraries distributed across different school buildings. The central library at KU boasts a substantial collection of 65,000 volumes encompassing various documents, such as journals, audio cassettes, CDs, magazines, and various subscribed electronic resources. To enrich the academic resources available to its community, Kathmandu University Central Library (KUCL) maintains subscriptions to multiple databases to disseminate electronic resources (KU, 2023).

(iii) Pokhara University (PU)

Pokhara University (PU) had its inception in 1986, and it officially came into existence as a university in 1997. The university wholly relies on government capital expenditure grants (PU, 2023). At the heart of its academic support system is the Pokhara University Central Library (PUCL), complemented by additional branch libraries housed in separate buildings. Presently, PUCL houses an extensive collection boasting over 40,000 volumes of diverse documents, which includes books, periodicals, magazines, theses, dissertations, CDs, and newspapers (PU, 2023).

(iv) Patan Academy of Health Science (PAHS)

PAHS is an independent, not-for-profit entity founded in 2008 (PAHS, 2023). As an accredited university, it boasts the highly-regarded Patan Academy of Health Sciences Library (commonly referred to as the PAHS Library), surpassing its counterparts among Nepal's medical libraries. With a vast collection comprising over 12,900,000 books, 30,000 journals, and an extensive array of medical-related databases (PAHS, 2023), the PAHS Library is a formidable resource for healthcare information.

(v) The Nepal Open University (NOU)

The National Open University (NOU), established in 2016 through the "Act of Nepal Open University 2016," operates with complete government funding. Its primary mission is to broaden the accessibility of higher education to individuals who have traditionally been excluded from conventional higher or tertiary education avenues. As an open university, NOU maintains a relatively modest physical collection. However, to cater to the needs of remote learners, the university has made substantial investments in online databases, ensuring a wealth of information

and resources are readily available to its user base (NOU, 2023).

2. Review of Related Literature

Effective utilization of information and communication technology (ICT) introduces a novel approach to enhancing connections between library users and libraries, optimizing the delivery of library services. Several prior research studies provide valuable insights into the subject at hand:

A study by Naveed et al. (2022) focused on core technology competencies essential for system librarians, such as cloud computing, web publishing, basic computing, computer networking, database management systems, and information systems. These competencies were identified as crucial for adapting to the evolving technological landscape. Shahzad (2021) expanded upon this by emphasizing the importance of adapting to new emerging technologies, automation-related skills, web-based skills, innovating abilities, and skills related to providing electronic services as core competencies for modern librarianship. Devi & Bhatt (2021) delved into the evolving roles of library services, library users, and professionals in light of technological advancements. Their work underscores the necessity of ICT in contemporary librarianship, emphasizing the need for academic librarians to update their ICT skills to effectively serve as information support hubs for society. Omehia et al. (2021) uncovered a significant correlation between computer competencies and proficiencies in Web 2.0 and information retrieval among academic librarians. They stressed the importance of ongoing training in information retrieval processes, Web 2.0 technologies, and fundamental computer operations for librarians in academic settings.

Singh (2021) noted that women tend to use Web 2.0 tools more frequently than men, with participants demonstrating familiarity with platforms such as blogs, Google Drive, wikis, social networking sites, Grammarly, Gmail, and RSS. Williams (2020) highlighted the role of Web 2.0 in providing academic libraries with a virtual workspace, supplementing traditional forms of communication like email and physical mail.

Gupta & Madhusudhan (2021) investigated the utility of CCTV systems in academic libraries for security, including theft prevention, safeguarding against unethical losses and missing items, preservation of rare materials through advanced camera technology, and enhancement of service efficiency. Another study by Ajeemsha and Madhusudhan (2019) emphasized the multifaceted benefits of Web 2.0, which serves as a potent medium for information retrieval, entertainment, and learning. Reshaping librarians' skills and competencies has been crucial to the library's evolution. Bajpai and Madhusudhan (2019) stressed the importance of ICT competencies and skills for library staff to provide effective services through technology. Shehu & Singh (2022) argued that staff training is essential for improving library ICT-based services, highlighting the need for ongoing professional development. Raju (2017) advocated for integrating IT knowledge and skills into library and information science curricula, emphasizing the importance of incorporating these skills as an integral part of the educational curriculum.

Bansode & Viswe (2017) assessed the ICT literacy rate among university library staff, finding that most staff possessed basic ICT skills and highlighting the need for further improvement. This study addresses a critical gap in the literature by examining the professional development of LIS professionals in university libraries in Nepal, contributing valuable insights to the evolving landscape of library science and ICT integration to prove their ICT literacy levels. As mentioned above, the literature explains the importance of implementing ICT in libraries and LIS professionals' attire for changing trends. There was a gap in that no study has been conducted in universities in Nepal to determine the professional development of LIS

professionals. Hence, this study fills the gap in the literature in university libraries in Nepal.

3. Statement of the Problem

The transformation from traditional print resources to digital information has profoundly influenced every facet of Nepal's academic library system. This shift has particularly impacted three key dimensions: the library staff, patrons, and the array of services offered. University libraries are pivotal in delivering diverse services by utilizing information and communication technology (ICT) applications within the academic landscape. However, there is a growing imperative for university libraries to elevate their sophistication in integrating ICT-based solutions within their physical and virtual spaces. It is noteworthy that library professionals are experiencing a shift in their mindset, becoming increasingly receptive to adopting ICT applications.

To effectively serve the evolving needs of individual and collective academic communities, it is crucial to continuously enhance the proficiency of the dedicated personnel responsible for delivering information and services. To progress in this direction, librarians must acquire comprehensive knowledge concerning utilizing computers and communication technology. Nepal's university libraries have responded to the academic community's expectations by expanding their services and offering an array of e-resources. Nonetheless, it remains imperative to gauge how much library and information science (LIS) professionals leverage ICT applications and assess their competence in handling these technologies. Surprisingly, there has yet to be a comprehensive investigation in Nepal to evaluate the impact of ICT on the professional activities of LIS experts. This study aims to shed light on how LIS professionals have kept pace with the rapid advances in ICT and the degree to which their professional development endeavours have equipped them to effectively navigate the ever-evolving landscape of cutting-edge technologies within the LIS field.

4. Objectives and Methodology of the Study

(i) to identify different ICT-based tools used for information services in the university libraries studied in Nepal;

(ii) to explore the ICT skills and competencies of LIS professionals in providing ICT services to their users;

(iii) to assess the Web/Library 2.0 skills and competencies of LIS professionals in the collaborative age;

(iv) to study the problems faced by LIS professionals for effective use of ICT in universities under study and

(v) To suggest new cutting-edge emerging ICT skills and competencies for LIS professionals to enhance existing library services in smart library services.

The study is limited to a focused pilot investigation involving five (5) university libraries in Nepal, as outlined in Table 1. Employing a survey approach, the research utilized a meticulously designed questionnaire to elicit insights from participants regarding their experiences with information and communication technology (ICT) applications within the unique contexts of their respective university libraries. The questionnaire was structured into four distinct sections, encompassing (i) general information, (ii) ICT skills and competencies, (iii) ICT skills and competencies in the collaborative era, and (iv) challenges encountered in the implementation of ICT applications.

During October 2023, the questionnaire was personally administered to five librarians, all of whom completed and returned the surveys, yielding a 100% response rate. The collected responses underwent a

comprehensive analysis employing descriptive statistics and were subsequently presented in six tables to facilitate a thorough and meaningful interpretation.

Table 1: List of participating University Libraries in Nepal

Sl. No.	University Name	Library	Library's URL
1.	Tribhuvan University (TU)	Tribhuvan University Central Library (TUCL)	www.tucl.edu.np
2.	Kathmandu University (KU)	Kathmandu University Central Library	https://ku.edu.np/central-library
3.	Pokhara University (PokU)	Pokhara University Central Library	https://pu.edu.np/library/
4.	Nepal Open University (NOU)	Nepal Open University (NOU) Library	https://nou.edu.np/
5.	Patan Academy of Health Sciences (PAHS)	Patan Academy of Health Sciences (PAHS) Library	https://www.pahs.edu.np/

5 Findings of the study

5.1 Demographic Information

Demographic data, encompassing factors such as gender, qualifications, experience, and the nature of work, has been assessed to gauge the robustness of human resource management within the library, as illustrated in Table 2.

Table 2: Demographic information of respondents (N=5)

Sl. No.	Particulars	No. of respondents	Percentage (%)
Gender			
(i)	Male	03	60
(ii)	Female	02	40
Academic Degree			
(i)	MLISc	00	100
(ii)	MPhil	00	00
(iii)	PhD	00	00
(iv)	BLISc.	00	00
Professional Designation			
(i)	Library Officer	02	40
(ii)	Library Assistant	01	20
(iii)	Librarian	01	20
(iv)	Deputy Librarian	01	20
(v)	Asst. Librarian	00	00
Professional Experience			
(i)	Below 5 years	01	20
(ii)	6 to 10 Years	00	00
(iii)	11 to 15 Years	02	40
(iv)	16 to 20 Years	00	00
(v)	20 to 30 Years	02	40

(vi)	Above 31 Years	00	00
Nature of Work*			
(i)	Library Administrating	05	100
(ii)	E-resources Management	04	80
(iii)	Technical Processing	04	80
(iv)	Institutional Repository	03	60
(v)	Current Awareness Services	03	60
(vi)	System Managing (IT)	03	60
(vii)	Acquisition	02	40
(viii)	Reference service	02	40
(ix)	Data Entry	02	40
(x)	Lending Service	01	20

Note: Multiple answers are permitted.

Table 2 shows the participant demographics breakdown, revealing that male participants outnumber females by 60% to 40%. This disparity suggests a predominance of males in top-level positions within the library. Academic qualifications serve as the foundation for any employee. In this context, all library professionals, including department heads, hold post-graduate degrees in Library and Information Science (LIS) as their highest academic qualification, constituting 100% of the sample.

Within the library ecosystem, various roles entail different responsibilities. Table 2 indicates that 40% of respondents hold the designation of 'library officers,' followed by 'librarians' (20%), 'deputy librarians' (20%), and 'library assistants' (20%). Regarding professional experience, 40% of respondents have accumulated 20-30 years of experience, while another 40% have 11-15 years of experience. This data underscores the substantial professional experience held by university librarians, which greatly contributes to their adept management of library facilities and fosters innovation in their roles.

Professional experience in this context signifies practical knowledge and expertise in the specific job domain. The study further elucidates that library professionals primarily engage in library administration (100%), e-resource management (80%), and technical processing (80%) as their core responsibilities.

Additionally, respondents mentioned their involvement in managing institutional repositories (60%), while similar responses were obtained for Current Awareness Services (CAS) and system management.

5.2 ICT Skills and Competencies

"Incorporating a diverse array of ICT tools, the Integrated Library Management Software (ILMS) streamlines library operations, expediting service delivery to users and ensuring prompt and efficient access" (Bajpai & Madhusudhan, 2019). As indicated in Table 3, 60% of respondents demonstrated proficiency in Koha ILS, while 40% reported non-usage of PMB software. A notable 60% of respondents expressed unfamiliarity with Mumolus software, with Libra and SoUL 2.0 registering 40% each in the same category.

"A digital library is a specialized repository housing a collection of digital artefacts encompassing textual, visual, audio, and video elements, all stored in electronic formats. These repositories meticulously manage digital assets within their collections" (Atanda et al., 2021). Table 3 illustrates that 60% of respondents possessed competencies pertaining to DSpace, while an equivalent percentage expressed a lack of utilization and the need for additional skills in Library space. Similarly, respondents exhibited comparable responses regarding Greenstone and Fedora software.

Content Management System (CMS) tools are pivotal in designing and developing websites featuring text, images, audio, and video content. As detailed in Table 3, most respondents expressed needing proficiency in CMS. Among the featured CMS platforms, Drupal and PHP Nuke topped the list with 60% each, followed by Joomla at 40%. Proficiency with WordPress was reported as average.

Table 3 underscores that all respondents (100%) possessed adept web search engine skills, while 40% demonstrated competency in subject directories. Furthermore, 80% of the surveyed librarians exhibited strong proficiency in MS Excel. On the other hand, VOSvieser, R & R Studio, and MatLab received a 60% rating in the "do not use" category.

In citation management, Table 3 revealed that 60% of respondents excelled in MS Word citation, with Mendeley and Zotero scoring 40% each. Conversely, 60% of respondents reported non-usage of EasyBib, while EndNote and RefWorks received 40% each in the same category.

Aside from providing convenience and comfort, libraries strive to create an enjoyable reading experience for patrons. However, exposing personal belongings and private information to the public poses inherent risks. AI-assisted IoT solutions can mitigate these risks (Bi et al., 2022). All respondents demonstrated proficiency in the barcode system, QR codes, biometrics, RFID, and CCTV at 60% each. In learning management systems, 40% of librarians reported skills in Google Classrooms and MS Teams/Channels. Meanwhile, most respondents expressed a need to acquire skills and awareness regarding STutor, Sakai, and Moodle.

Regarding video/audio/streaming conference tools, 80% of respondents showcased proficiency in Zoom, while Teams and Skype each registered 60%. Surprisingly, 60% of respondents reported non-usage of the Cisco application. In plagiarism detection tools, 40% of university librarians exhibited proficiency in iThentic, with equal responses (40%) in the "do not know" category for Ouriginal, Duplichecker, and Turnitin.

Within academic writing tools, 40% of respondents displayed competence in Grammarly, while 40% expressed a need to learn Quillbot software. As evidenced in Table 3, all respondents (100%) possessed proficient skills in handling memory drives and barcode printing. Except for server maintenance, most library professionals demonstrated comprehensive knowledge of hardware tools. All respondents were well-versed in Windows OS and associated applications like MS Word and MS PowerPoint. However, 40% of respondents expressed a need to acquire skills in Mac OS. Proficiency in cloud computing applications was widespread, except for MS Form, which 40% of librarians sought to learn. Sixty per cent of respondents demonstrated fair knowledge of Google Drive. At the same time, 40% expressed needing proficiency in OneDrive, part of MS 365. Knowledge of cloud computing applications except MS Form. Forty per cent of librarians needed to learn the MS Form cloud applications. Sixty per cent of respondents have a fair knowledge of Google Drive, and 2 (40%) of respondents needed to learn OneDrive, which is handled under MS 365.

Table 3: ICT Skill and Competency Tools (N=5)

Sl. No.	Particulars	Good (%)	Fair (%)	Poor (%)	Do not use (%)	Don't Know (%)
	ILMS Tools					
i.	Koha	1(20)	3 (60)			1 (20)

ii.	PMB	1(20)	1(20)		2 (40)	1(20)
iii.	SoUL2.0	1(20)		1(20)	1(20)	2 (40)
iv.	Libra	1(20)		1(20)	1(20)	2(40)
v.	Mumolus	1(20)			1(20)	3 (60)
Institutional Repository Tools						
i.	DSpace	1(20)	3(60)		1(20)	
ii.	Library Space	1(20)			3 (60)	1(20)
iii.	Eprints	1(20)	1(20)		2(40)	1(20)
iv.	Greenstone			1(20)	3(60)	1(20)
v.	Fedora				3(60)	2(40)
Content Management System (CMS) Tools						
i.	WordPress	2(40)	2(40)		1(20)	
ii.	Joomla		1(20)	1(20)	1(20)	2(40)
iii.	Drupal				2(40)	3(60)
iv.	PHP Nuke				2(40)	3(60)
Navigation Tools						
i.	Web Search engine	5(100)				
ii.	Federated Search engine	1(20)	1(20)		1(20)	2(40)
iii.	Subject Gateways	1(20)		1(20)	1(20)	2(40)
iv.	Web Directories	2(40)	1(20)	1(20)		1(20)
Statistical and Visualization Tools						
i.	IBM SPSS	1(20)	1(20)	2(40)		1(20)
ii.	MS Excel	4(80)	1(20)			
iii.	R & R Studio		1(20)		3(60)	1(20)
iv.	SAS		1(20)		2(40)	2(40)
v.	VOSviewer				3(60)	2(40)
vi.	STATA	1(20)		1(20)	1(20)	2(40)
vii.	BIBExcel		1(20)	1(20)	1(20)	2(40)
viii.	MatLab				3(60)	2(40)
Citation Creation & Reference Management Tools						
i.	RefWorks	1(20)		1(20)	2(40)	1(20)
ii.	EndNote	1(20)	1(20)	1(20)	2(40)	
iii.	Easy Bib		1(20)		3(60)	1(20)
iv.	Mendeley	2(40)	1(20)		1(20)	1(20)
v.	Zotero	2(40)	1(20)		1(20)	1(20)
vi.	BibMe	1(20)	1(20)	1(20)		2(40)
vii.	MS Word Citation Tool	3(60)			1(20)	1(20)
Security and Surveillance Tools						
i.	Barcode	5(100)				
ii.	QR code	3(60)	1(20)		1(20)	
iii.	Biometric	3(60)	1(20)			1(20)
iv.	Smart Card	1(20)	1(20)		2(40)	1(20)
v.	CCTV	3(60)		1(20)	1(20)	
vi.	RFID/Electromagnetic Security	3(60)				2(40)

Learning Management System Tools						
i.	Google Classroom	2(40)	2(40)			1(20)
ii.	MS Teams/Channels	2(40)		2(40)		1(20)
iii.	ATutor	1(20)			2(40)	2(40)
iv.	Sakai	1(20)			2(40)	2(40)
v.	Moodle	1(20)			2(40)	2(40)
Video/Audio/streaming Conference Tools						
i.	Zoom	4(80)	1(20)			
ii.	Teams	3(60)		1(20)	1(20)	
iii.	Meets	2(40)		1(20)	1(20)	1(20)
iv.	Cisco Webex		1(20)		3(60)	1(20)
v.	Skype	3(60)	1(20)		1(20)	
Plagiarism Detection Tools						
i.	iThenticate	2(40)	1(20)		1(20)	1(20)
ii.	Original (Urkund)		1(20)		2(40)	2(40)
iii.	Duplichecker	1(20)	1(20)		1(20)	2(40)
iv.	Turnitin	1(20)	1(20)	1(20)		2(40)
Academic Writing Tools						
i.	Grammarly	2(40)	2(40)			1(20)
ii.	Quillbot		1(20)		2(40)	2(40)
Miscellaneous ICT Tools						
Hardware						
i.	Image scanning	4(80)	1(20)			
ii.	E-book Reader	3(60)	1(20)			1(20)
iii.	Digital camera	2(40)	3(60)			
iv.	LCD Projector	4(80)	1(20)			
v.	Laser printing	3(60)	2(40)			
vi.	CCTV	4(80)				1(20)
vii.	Webcam	4(80)	1(20)			
viii.	Memory drive	5(100)				
ix.	Wireless network	4(80)	1(20)			
x.	Barcode printing	5(100)				
xi.	Server Maintenance		2(40)	1(20)	1(20)	1(20)
Operating System						
i.	Windows	5(100)				
ii.	Mac OS			1(20)	2(40)	2(40)
iii.	Linux		2(40)		3(60)	
MS Office Applications						
i.	MS Word	5(100)				
ii.	MS Excel	4(80)	1(20)			
iii.	MS PowerPoint	5(100)				
iv.	MS Access	1(20)	1(20)		2(40)	1(20)
Cloud Computing Applications and Tools						
i.	Google Doc.	3(60)	2(40)			
ii.	Google Form	3(60)	1(20)			1(20)
iii.	Google Sheet	3(60)	2(40)			1(20)

Sl. No		Good	Fair	Poor	Do not use	Don't Know
iv.	MS PowerPoint	4(80)				1(20)
v.	MS Word	3(60)	1(20)			1(20)
vi.	MS Excel	2(40)	2(40)			1(20)
vii.	MS Form		2(40)		1(20)	2(40)
Web drive Tools						
i.	Google Drive	2(40)	3(60)			
ii.	OneDrive	1(20)	1(20)		1(20)	2(40)

Note: Multiple answers are permitted.

5.3 Web 2.0/Library 2.0 Tools

The survey inquired about the respondents' Web/Library 2.0 skills and competencies, offering them nine different options (as presented in Table 4). The data from Table 4 highlights that a significant 80% of the respondents possess adept skills in managing social media and social networking platforms, closely followed by proficiency in blogs (60%), academic websites (60%), and audio/video sharing platforms (60%). Interestingly, it was observed that 60% of the respondents indicated that they do not utilize RSS feeds. Notably, Web 2.0/Library 2.0 tools are highly regarded for disseminating and promoting library resources, underscoring their crucial role in supporting the needs of contemporary library users.

Table 4: Web 2.0/Library 2.0 Tools (N=5)

Sl. No	Web 2.0/Library 2.0 Tools	Good (%)	Fair (%)	Poor (%)	Do not use (%)	Don't Know (%)
(i)	Wikis	2(40)	1(20)		1(20)	1(20)
(ii)	Blogs	3(60)	1(20)		1(20)	
(iii)	RSS feeds			1(20)	3(60)	1(20)
(iv)	Podcasts/Vodcast		1(20)		2(40)	2(40)
(v)	Social Bookmarking sites	1(20)		1(20)	2(40)	1(20)
(vi)	Social Networking sites (Facebook, Twitter/LinkedIn)	4(80)	1(20)			
(vii)	Academic Social Networking sites (ResearchGate, Academic)	3(60)	2(40)			
(viii)	Social Media (WhatsApp/Viber)	4(80)			1(20)	
(ix)	Audio/video sharing/webcasting	3(60)	1(20)	1(20)		

5.4 Opinion of the ICT applications

The survey sought respondents' opinions regarding the impact of ICT (Information and Communication Technology) applications within the operational framework of the library, as depicted in Table 5. The data from Table 5 indicates that 100% of respondents strongly agreed that ICT applications significantly enhance the library's overall status. Additionally, the majority of respondents, amounting to 80%, provided a consistent rating of "strongly agree" for the following statements: (i) "ICT applications enhance library services." (ii) "ICT applications facilitate swift access to up-to-date information." (iii) "ICT applications promote the knowledge and skills of library staff." (iv) "ICT applications reduce the

workload of library professionals." and (v) "ICT applications safeguard library data." Furthermore, the same level of agreement (80%) was recorded for the following statements: (i) "ICT applications enhance the job satisfaction of library professionals." (ii) "ICT applications elevate the standing of the library", and (iii) "ICT applications contribute to increased research visibility." These findings underscore the widespread consensus among respondents regarding the positive impact of ICT applications on various facets of library operations and professional development.

Table 5: Opinion regarding the application of ICT in working library (N=5)

Sl. No.	Attitude	Strongly disagree (%)	Disagree (%)	No opinion (%)	Agree (%)	Strongly agree (%)
(i)	ICT applications facilitate quick access to current data				2(40)	3(60)
(ii)	ICT applications improve the quality of library services				1(20)	4(80)
(iii)	ICT applications help to encourage the knowledge and skill of library staff				2(40)	3(60)
(iv)	ICT applications increased job satisfaction of Library Professional				4(80)	1(20)
(v)	ICT applications help to improve communication				4(80)	1(20)
(vi)	ICT applications improve the status of library					5 (100)
(vii)	ICT makes an integration within the library				3(60)	2(40)
(viii)	ICT applications reduce the workload of library professionals		1(20)		1(20)	3(60)
(ix)	ICT applications protect the library data				2(40)	3(60)
(x)	ICT applications help to enhance the research visibility				4 (80)	1(20)
(xi)	ICT applications make accessible library resources remotely				2 (40)	3(60)
(xii)	ICT applications improve the routine/traditional work of the library				3(60)	2(40)
(xiii)	ICT affects regular budgeting provision				3(60)	2(40)

Note: Multiple answers are permitted.

5.5 Obstacles to the use of ICT applications

A multiple-choice question was raised concerning the challenges associated with adopting ICT applications. As depicted in

Table 6, it is evident that every participant identified a deficiency in infrastructure and insufficient professional training as the primary impediments. A significant 80% of the respondents concurred that the principal barrier to using ICT applications resided in insufficient coordination among library staff and a need for more financial resources. Furthermore, an equivalent proportion of respondents (60%) shared a pressing need for greater initiative from professional associations and more self-assuredness in technical capabilities, leading to suboptimal implementation of ICT tools.

Table 6: Obstacles to the use of ICT applications (N=5)

Sl. No.	Particulars	No. of Respondents	Percentage (%)
(i)	Lack of infrastructure	05	100
(ii)	Inadequate training in ICT	05	100
(iii)	Lack of coordination among library staff	04	80
(iv)	Financial Problems	04	80
(v)	Lack of initiative role from professional associations	03	60
(vi)	Lack of technical self-confidence	03	60
(vii)	Health Problems	02	40
(viii)	Lack of support from higher authorities	02	40

Note: Multiple answers are permitted.

5.6 Suggestions for improving cutting-edge emerging ICT Skills

An open-ended question was asked for recommendations for enhancing the current ICT competencies of LIS professionals and integrating ICT tools within academic library settings. Among the responses, four librarians emphasized the importance of regular attendance at pertinent professional conferences, workshops, and ICT-focused webinars or MOOCs to stay current. Three participants suggested that organizations should organize internal training programs to keep their staff abreast of ICT advancements in the context of LIS professional development. Two respondents proposed that professional associations should take the lead in fostering professional skill development. Lastly, one participant advocated for the active involvement of library professionals in academic and research endeavours as another avenue for ICT skill refinement.

6. Discussion

Quality higher education relies heavily on a robust library and information services infrastructure, as these elements significantly contribute to the overall educational excellence within universities. As noted by Onuoha and Obialor (2015), "Information and communication technology (ICT) offers a valuable opportunity to deliver enhanced information services and access to a diverse array of digital resources to university clients". The effectiveness and efficiency of individuals holding higher academic degrees are widely recognized. However, these findings have led to the absence of advanced academic programs in the state and central universities and participants' job satisfaction. Moreover, the current minimum qualification requirements of universities have yet to serve as a sufficient motivator for individuals to pursue higher academic degrees.

It is worth noting that the study uncovered a need for more academic research experience or doctorate degrees among professionals, as depicted in Table 2. Nonetheless, employees' practical knowledge and experience are important to the organization. Surprisingly, even individuals with minimal academic qualifications, such as "library assistants," are

tasked with handling central university libraries, as indicated in Table 2.

The responsibilities of library professionals can vary from one institution to another. As institutional leaders, Librarians are primarily responsible for overseeing activities, formulating policies, planning, budgeting, managing human resources, and making critical decisions, among other functions, as outlined in Table 2.

Adopting diverse ICT applications is vital to providing intelligent services within library premises. Implementing such ICT technologies involves numerous components, including the availability of ICT-skilled and competent personnel with positive attitudes. Libraries may choose software solutions based on features, budget constraints, availability, and the expertise of their workforce. Library professionals must possess the necessary skills and competencies to manage integrated library systems (ILS) effectively, as top-level employees play a crucial role in monitoring and decision-making. Furthermore, working library professionals may have specialized expertise in the adopted system, which may exclude others, as indicated in Table 3.

Library professionals must also possess the knowledge and skills to manage digital content within institutional repositories. As stated by Dahl et al. (2006), managing locally created digital content repositories is an increasingly critical and relatively new area for libraries.

Content management systems (CMS) enable the direct publication of content on the web. The study results highlight university libraries' reliance on outsourcing web content design and development. Therefore, library professionals should develop CMS skills to manage and deliver library resources in a web-based format, as demonstrated in Table 3.

The primary objective of a discovery tool is to replace traditional Online Public Access Catalogs (OPACs) by allowing library users to search and access a wide range of resources, including institutional bibliographies, repositories, catalogue records,

local databases, and other collections. ICT-capable library professionals are well-equipped to design, develop, and manage such navigation tools. While federated search technology and discovery tools share similar roles in searching and retrieving user information, these technologies may have legacy differences. Notably, subject gateways and federated search engines appear to be familiar to respondents, as indicated in Table 3.

Statistical and visualization tools are crucial in analyzing and presenting research data, both offline and online. Researchers utilize these tools for data analysis, interpretation, and visualization. Skilled and competent library professionals are essential in supporting university library users using these tools to enhance research visibility. However, the study suggests that library and information science (LIS) professionals need further training and knowledge in statistical and visualization tools to improve universities' research impact.

Citation and reference management software are valuable aids for academics in scholarly writing. Various tools, including Microsoft Word features and online citation generators, assist in creating citations and managing references. Remarkably, reference management software (RMS) is integrated into popular databases like Web of Science (WOS), Scopus, Emerald, and ProQuest, and university librarians should be knowledgeable about these tools.

Security surveillance tools are crucial for safeguarding physical and digital library premises against unethical behaviour. The study emphasizes the need for LIS professionals to improve their skills in handling smart card systems to enhance security. Learning management systems (LMS) are explicitly designed for academic purposes to support e-learning and e-teaching and are widely used in developing countries.

Streaming tools facilitate synchronous communication and collaboration among presenters and participants, making them

increasingly popular for conducting academic activities.

Regarding plagiarism, plagiarism detection software ensures the originality of documents before submission. The study underscores the importance of university librarians acquiring expertise in using plagiarism detection software and educating library users to prevent plagiarism in their research work. Advanced plagiarism checkers can also assist researchers in eliminating grammar errors and improving the structure of their documents through paragraphing.

Academic writing tools like Grammarly and Quillbot support systematic and logical construction of academic papers. These tools are popular for checking and correcting grammar, detecting plagiarism, and facilitating paraphrasing. Basic ICT skills and competencies are essential for LIS professionals to perform routine tasks, and a foundation in various ICT tools, including hardware, operating systems, MS Office applications, cloud computing applications, and web drive tools, supports the adoption of advanced and specialized applications in the library.

Table 4 highlights the need for respondents to catch up in implementing Web 2.0/Library 2.0 tools, emphasizing the urgent necessity for LIS professionals to update their collaborative skills and competencies to provide effective collaborative library services.

The role of librarians is evolving to encompass cutting-edge emerging ICT skills and competencies, enabling the transformation of traditional library services into smart library services, as suggested by Table 5. ICT skills and competency are essential factors in technology adoption. Professional development programs are instrumental in upgrading and updating personnel's skills and competencies. However, the present study identifies challenges related to infrastructure, insufficient IT training, and coordination among library staff and finance, as illustrated in Table 6. Consequently, it is recommended

that university authorities and library professional associations in Nepal assume responsibility for conducting periodic training programs to enhance LIS professionals' ICT skills and competencies, boosting their technical self-confidence and enabling them to utilize various ICT tools and library services effectively. Similar challenges have been identified in recent studies by Hussain and Nayab (2021), including a lack of financial resources, limited training opportunities, the absence of professional associations, reluctance to engage with such platforms, and inadequate infrastructure, as previously reported by Enakrire & Ocholla (2017).

Learning is an ongoing process, particularly in light of the rapidly evolving landscape of cutting-edge ICT applications. Library professionals must remain current with the latest technological developments by actively participating in professional development activities, such as conferences, webinars, workshops, and training sessions. In-house training can mitigate issues related to staff constraints, such as health, time, finances, and family responsibilities. In this pursuit, staff, institutions, and associations all have vital roles to play in enhancing the professionalism and competencies of library professionals."

7 Conclusion

This study has unveiled a pressing need for enhanced ICT skills and competencies among librarians within most university libraries examined, owing to several factors. These factors include funding deficiency, inadequate staff training in handling computers and software packages, and administrative challenges. The need for more proficiency in ICT tools hampers librarians from embracing and delivering optimal services to contemporary users who rely on social networks, social media, and mobile technologies. Consequently, the study advocates for university librarians to bolster their advanced ICT skills and competencies to offer high-quality, efficient, mobile-based,

smart library services in our tech-savvy environment.

To address this imperative, it is incumbent upon university authorities to take prompt action by empowering librarians to enhance their ICT skills and competencies through continuous professional development programs and incentives or promotions. The findings of this study shed light on the barriers obstructing the adoption of ICT applications in Nepalese university libraries. Moreover, this research marks a pivotal shift toward implementing ICT applications in library services, thereby augmenting the return on investment of library resources in the studied university libraries in Nepal.

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