The Librarian's Role in the Digital Age in the Academic Community

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Abstract: The role of librarians in academic institutions has evolved dramatically in the digital age. With the advent of innovative technologies, and the growing importance of information and digital literacy, librarians have become essential implement to support teaching, learning and research, in higher education. This paper explores the growing responsibilities of academic librarian's roles within the digital landscape, focusing on their contributions to research support, data management, instructional technology, and digital resource curation. The study adopts quantitative to examine how the role of academic librarians has reformed to meet the user's demands in the digital age. To quantify this evolving role one hundred and fifty (150) academic librarians, three to five each, from various academic institutions participated in a survey, in order to evaluate their involvement, and addressing their responsibilities in digital resource management, information and digital literacy instruction, and technology-based user support. Findings reveal that librarians with advanced digital skills perceive themselves as more effective in their carrier roles, with a positive correlation between information and digital literacy proficiency and user support satisfaction, in supporting academic research. The findings emphasised the need for continuous professional development in digital skills and services to empower librarians to support their academic community effectively in the evolving digital landscape.

Keyword: Digital Literacy, Digital Transformation, Digital Resources, Information Literacy, Research support and Data Management

INTRODUCTION

In the digital age, academic libraries have transformed from physical repositories to dynamic centres. With the rise of digital resources and online databases, the role of librarians have been renewed to technology-based academic and research support. Librarians are now expected to facilitate digital literacy, assist users with complex digital queries, and manage digital collections that support a global academic community (Chen, 2022; Lee & Brown, 2021)..As digital technologies reshapes and redefines information access and academic research practices, librarians faced, not only, with the new expectations, requiring them to possess advanced technological skills and adapt to digital tools for information management and user support. But also, participate in routines job beyond traditional print resource management, concentrating on providing digital and information literacy support, managing e-resources, providing tech-based user instruction as well as offering virtual reference services. Understanding these roles is essential to optimize support for the academic community (Brown & Green, 2023; (Smith, 2021).

PROBLEM STATEMENT

Despite the renowned transferral in academic libraries' functions, limited quantitative research exists that measures the specific ways in which librarians' roles have transformed and the new skills they are required to possess. This study aims to fill that gap by providing quantitative data and insights to measure the impact into the skills and responsibilities required of librarian's roles in the digital age. As academic communities increasingly rely on digital tools, Understanding how librarians perceive these changes and identifying the skills they view as essential in the digital age is critical for shaping and redefining prospective training programs and professional development initiatives within academic librarianship.

SIGNIFICANCE OF THE STUDY

This research provides valuable insights into the evolving role of librarians in the academic institutions, highlighting areas where digital skills training is particularly needed. The findings can help libraries develop targeted training programs to equip librarians with the digital competencies necessary for modern information management and academic support. It offers recommendations for academic libraries on necessary instructional programs and skill development. These insights can help libraries better support academic communities in navigating digital resources effectively.

RESEARCH QUESTIONS AND HYPOTHESES

This study addresses the following research questions:

- How are librarians' responsibilities shifting in the digital age within academic libraries?
- What digital skills are deemed necessary for librarians to support academic communities effectively?
- How do librarians perceive the impact of their digital skills on their effectiveness in supporting academic communities?

Hypothesis 1: Academic librarians spend considerable amount of time on digital resource management than on traditional tasks.

Hypothesis 2: Librarians perceive digital literacy support as increasingly fundamental to their roles.

LITERATURE REVIEW

LIBRARIANS' INSTRUCTIONAL ROLES IN DIGITAL LITERACY SKILLS

Academic librarians are now reflected as fundamental figures in promoting digital literacy skills support, which consist of teaching users how to identify, locate, evaluate, and use digital resources dependably. Research literature demonstrates that digital literacy skills is indispensable for academic achievement, and librarians are gradually tasked with evolving and providing digital literacy skills services (Johnson, 2020).

In response to changing skills and competencies for Librarians in digital demands, Smith (2021), stressed that academic librarians requires a wide range of proficiencies, from basic computer literacy, coding and data analytics to advanced data management skills. To support these skills, various academic institutions are currently focusing more on digital skills and instructional training programs for librarians, in order to support them develop these digital skills, so as to meet the evolving needs of the academic community (Lee & Brown, 2021). Even though the level of support varies far and wide.

Consequently, beyond managing digital collections, librarians are also seen as digital literacy skills facilitators. Carrying out as key figures in promoting digital literacy skills within academic communities. Digital literacy skills involves teaching library users in academic community how to evaluate and use digital resources efficiently, skills critical for academic attainment (Johnson, 2020).

DIGITAL TRANSFORMATION IN ACADEMIC LIBRARIES

The transferral to digital resources in academic libraries has led to the increasing prevalence of online databases, digital journals, and e-books (Martinez, 2019). Librarians are now responsible for managing these digital resources, necessitating familiarity with new skills in information technology, digital resource management software, digital content management as well as data management practices (Smith, 2021). According Lee and Brown (2021), academic libraries have progressively more integrated digital resources into their collections, reshaping librarians' roles from traditional custodians of physical media to administrators of enormous digital repositories (Green, 2019). These changes require librarians to develop skills in digital resource management and to stay updated on new technologies for accessing and organizing information (Smith, 2021).

Accordingly, with the role of librarians in digital literacy, academic community rely heavenly on digital tools for teaching, learning and research, librarians have become key facilitators of digital literacy in academic institutions. Digital literacy instruction includes teaching users how to critically evaluate online

resources, navigate databases, and use digital tools effectively (Johnson, 2020). Research has shown that digital literacy is a essential skills for academic achievement, emphasising librarians' roles in providing such instructions and training (Julien, & Williamson, 2019).

THE SHIFT FROM TRADITIONAL TO DIGITAL RESOURCES

Traditionally, academic libraries were places where patrons accessed physical collections of books, journals, and other print materials. As maintain by Hernandez (2020), that these collections were curated and managed by librarians, who played a key role in organizing resources. Providing guidance to library users in their enquiries. Then libraries relied on traditional cataloguing systems, such as the Library of Congress classification system or the Dewey Decimal System, to effectively organize print resources in techniques that enabled easy access and discovery (Hernandez, 2020; Smith & Adams, 2021).

With the advent of the digital resources, the role of librarians in resource management has dramatically transformed and shifted, from managing physical collections to overseeing vast digital repositories that include academic databases, e-books, online journals, as well as multimedia files. Gadd and Oppenheim (2018) argued that this revolution of evaluating the quality of digital resources and ensuring that academic users have access to reliable, peer-reviewed content, has compelled innovative expertise and requisite skills among librarians. Who will be responsible for managing the hybrid environment of both physical and digital collections (Jones & Lee, 2022).

Digital resources have basically being reformed the way information is handle, retrieved and used. Contrasting print materials, digital content can be retrieved remotely at any giving time possible, making it more suitable for users to use them from anywhere (Gadd & Oppenheim, 2018). Furthermore, digital libraries can accommodate enormous amounts of data, much of which would be unbearable to stock in a physical library. For instance, various academic institutions currently accommodate generalised or specialized subject databases for example JSTOR, PubMed, and Google Scholar. These provides access to thousands of conference proceedings, peer-reviewed articles, and other scholarly publications (Hernandez, 2020). However, this has introduced varied complications and challenges for librarians. As property representative of digital collections, librarians are required to manage the complex structures that hold these resources. So as to ensure that they are accessible and discoverable (Julien, & Williamson, 2019). They are also responsible with managing licensing agreements with publishers, which often govern how digital content can be accessed and shared. Accordingly, in a world of fast changing digital technologies, it is essential that librarians must continually familiarise to new and innovative tools and systems that have emotional impact on how academic resources are handle, stored, accessed, and shared. (Gadd & Oppenheim, 2018). Although, digital preservation approaches, such as regular backups, data relocation, and the use of open-source formats, are therefore, critical for preserving long-term access to digital resources (Hernandez, 2020).

FACILITATING INFORMATION LITERACY IN THE DIGITAL ERA

The absolute volume of information available online in the digital age, can be overpowering. The internet however, provides access to a vast collection of digital resources, comprising news articles, academic research, e-books and e-journals, as well as user-generated content. Nevertheless, not all information on the internet is reliable or accurate. In this situation, information literacy skills support has become an indispensable skill for researchers, and all other members of the academic community. Julien and Williamson (2019) maintain that the ability to critically evaluate and use information effectively has become an essential skill for academic achievement. Information literacy skills covers a broad range of skills comprising the ability to identify, locate, evaluate, and use information resources effectively.

Moreover, librarian's role according to Whitmire (2017) has expanded to include not only, teaching users how to navigate a complex digital landscape. But also, critically assessing online sources, understanding citation management, and distinguishing between peer-reviewed content. They are actively involved in designing and delivering information literacy skills programs tailored to specific disciplines. For instance,

a librarian specializing in the sciences might provide instruction on navigating scientific databases and assessing research articles, while a librarian in the humanities might focus on accessing digital archives and primary sources, Julien, and Williamson (2019), which can achieve through workshops, webinars, one-on-one conferences, and embedded library instruction courses, librarians ensure that users develops the necessary skills to become critical clients and producers of information. However lots of student's adepts the use of search engines to find information, they may lack the skills to critically evaluate sources or to search academic databases effectively (Whitmire, 2017).

It is evident that, Gadd and Oppenheim (2018), information literacy instruction takes various forms in academic libraries. A number of librarians offers one-to-one sessions, where students can receive academic mentorship or personalized guidance on their research projects. While others teach group workshops, webinars or participate in classroom instruction. In addition, several academic libraries have developed online guides, and tutorials that permit students to learn at their own pace. The integration of information literacy skills into the curriculum has become a priority for many academic institutions, as it helps students develop critical thinking skills and become more responsible patrons and producers of information (Julien, & Williamson, 2019).

EVOLVING RESEARCH SUPPORT AND DATA MANAGEMENT

Academic libraries are increasingly becoming centres for research support services. As research has become more data-driven, academic librarians have taken on an increasingly important role in supporting research projects, particularly in the areas of data management and research dissemination. Research support services in academic libraries now encompass a range of activities, from facilitating researchers to develop data management plans (DMPs) to providing guidance on open access publishing. Librarians assist faculty and students throughout the research process, from literature reviews to data management and publication. Librarians are instrumental in ensuring that research data is organized, preserved, securely, and made accessible to other researchers, in order to enhance fostering transparency and collaboration in the academic community. As emphasised by Peng and Tao (2022), that research becomes more data-driven, various Academic librarians now provide critical assistance at various stages of the research process, including literature reviews, data management, and scholarly communication. They also specializes in specific academic disciplines, offering tailored support in areas such as data curation, systematic reviews, and scholarly communication (Gadd & Oppenheim, 2018).

Data management in the other hand, is a key area where librarians have expanded their roles. Librarians assist researchers in creating data management plans (DMPs) for grant applications, ensuring that research data is organized, preserved, and shared in compliance with best practices. They also help users navigate the ethical and legal considerations of data sharing, particularly with regard to privacy, intellectual property, and compliance with institutional policies. In addition, librarians play a crucial role in facilitating access to publicly funded research data and supporting open science initiatives (Hernandez, 2020).

Accordingly, numerous research funding agencies now require researchers to submit DMPs as part of their grant applications, outlining how they will manage, store, and share their data. Librarians with expertise in data management work closely with researchers to develop these plans, ensuring that the data complies with funder requirements and institutional policies. They also assist in organizing research data, creating metadata, and ensuring that the data is accessible for future use (Gadd & Oppenheim, 2018). Furthermore, academic librarians are actively involved in supporting interdisciplinary research. As academic disciplines become more interconnected, librarians facilitate collaboration by serving researchers discover resources and expertise across different fields.

Another significant area of research support skills services, according to Peng and Tao (2022), that it involves scholarly publishing. Librarians provide guidance on open access publishing, helping researchers understand the benefits of making their work freely available while balancing the challenges of copyright

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and intellectual property. They assist in selecting appropriate journals, formatting manuscripts, and ensuring compliance with funders' requirements for open access dissemination.

Librarians also play a critical role in supporting open access initiatives. Open access refers to the practice of making research outputs freely available to the public, without the barriers of subscription or paywalls. Martin and Lee (2024), stresses that many academic libraries have established institutional repositories, where researchers can deposit their work for open access. Librarians assist researchers in navigating the complexities of open access publishing, including selecting appropriate journals, understanding copyright and licensing options, and ensuring compliance with funders' open access requirements (Hernandez, 2020).

ETHICAL CHALLENGES: PRIVACY, COPYRIGHT, AND OPEN ACCESS

As academic libraries transference further into the digital dominion, and digital technologies continue to shape the academic landscape. One of the primary concerns is the protection of user privacy in an increasingly digital world. Academic librarians face new ethical challenges related to privacy, copyright, and the accessibility of information. These issues are particularly important in an era where academic resources are increasingly available online and where enormous amounts of personal and research data are collected and shared. Librarians are responsible for ensuring that users can access resources without violating copyright laws or compromising privacy. Librarians must ensure that the personal information of library users, including browsing habits and research interests, is protected. This involves safeguarding against data breaches, securing library systems, and educating users about privacy concerns related to online resources. They advocate for open access publishing, ensuring that academic work is available to a broader audience while balancing the interests of authors and publishers (Hernandez, 2020).

Moreover, privacy is a significant concern for librarians, who must protect the confidentiality of library users. Digital technologies have made it easier to track user behaviour, including their searches, reading habits, and research preferences. Hanna (2020), conserves that copyright is another key area where librarians play an essential role. They support clienteles navigate copyright laws and ensure compliance with intellectual property regulations. In an era of increasing digital content sharing, librarians help academic community understand the limitations of copyright, fair use, and licensing agreements. Additionally, librarians promote open access publishing as a means of making research more widely available while respecting authors' rights and intellectual property (O'Connor & Thompson, 2020).

Generally, digital technology has transformed the role of academic librarians. As technology continues to advance, librarians are not just custodians of books but are pivotal in supporting research, fostering information literacy, facilitating data management, and contributing to innovative teaching practices. Their expertise in information organization and access, along with their commitment to ethical standards, positions librarians as key players in the evolving landscape of higher education. Positioning them as essential partners in teaching, research, and scholarly communication. From managing physical collections, curating digital collections to promoting information literacy, supporting data management, and addressing ethical concerns, librarians play an essential role in facilitating access to information, supporting research, promoting information literacy, and ensuring ethical standards are maintained, as well as ensuring that academic institutions adapt to the challenges and opportunities presented by digital technologies. As the academic community and technology continues to evolve, librarians must continue to adapt, developing new skills and engaging in innovative practices that align with the needs of the community of users (Hanna, 2020). In doing so, they remain essential partners in advancing academic achievement and fostering a culture of lifelong learning in the digital age.

METHODOLOGY
RESEARCH DESIGN

This study employed a quantitative survey design to collect data on academic librarians' evolving roles in the digital age, with the objective to measure the impact of digital skills on librarians' efficiency in

academic community. A cross-sectional survey was conducted to collect data from librarians working in diverse academic institutions. This facilitates for the systematic collection and analysis of data related to digital competencies and task frequency among librarians.

PARTICIPANTS

A total of one hundred and fifty (150) academic librarians participated in the survey, representing a diverse range of institutions. Participants were selected through stratified sampling to ensure a diverse representation including Polytechnics, Colleges, Universities, as well as community colleges. That was used to attain and ensure representation across these different types of academic institutions.

DATA COLLECTION

Data were collected through a structured survey instrument containing 20 questions divided into three key sections:

- **Digital Resource Management:** Questions evaluated librarians' roles in managing and maintaining digital collections.
- **Digital Literacy Instruction:** This section assessed librarians' involvement in teaching information and digital literacy to library users comprising of students, academicians and researchers.
- **Technology-Based User Support:** Questions focused on librarians' engagement in providing technology support, such as troubleshooting access to digital resources.

DATA ANALYSIS

Descriptive statistics, including means, standard deviations, and frequency distributions, were calculated to summarize the responses. Pearson correlation analysis was used to measure the relationship between digital skills proficiency and perceived effectiveness in supporting academic research. The findings were organized into tables to facilitate clear presentation and interpretation.

RESULTS

DESCRIPTIVE STATISTICS

The survey results includes multiple tables to detail various aspects of the survey responses and provided insights into librarians' involvement in digital tasks. Table 1 shows the demographics of the sample, highlighting the diversity of institution types and librarian gender representation.

	Frequency (N=150)	Percentage (%)
Gender		
Male	60	40%
Female	90	60%
Institution Type		
Research University	80	53.3%
Liberal Arts College	40	26.7%
Community College	30	20%

Table 1: Demographics of Respondents

Role Area	Mean Score (1-5)	Standard Deviation
Digital Resource Management	4.3	0.72
Digital Literacy Instruction	3.9	0.85
Technology-Based User Support	4.1	0.68

Table 2: summarizes the average scores for librarians' involvement in digital resource management, digital literacy instruction, and technology-based user support

The highest level of involvement was reported in digital resource management (M = 4.3, SD = 0.72), followed by technology-based user support (M = 4.1, SD = 0.68). Digital literacy instruction scored slightly lower (M = 3.9, SD = 0.85), suggesting that while digital literacy instruction is important, it is not as prevalent as resource management responsibilities.

ENGAGEMENT IN DIGITAL RESOURCE MANAGEMENT

Task	Mean Score (1-5)	Standard Deviation
Digital Collection Curation	4.2	0.73
Digital Access Troubleshooting	4.0	0.68
Digital Repository Maintenance	3.8	0.85
E-Resource Licensing	4.1	0.72
Managing Digital Research Repositories	3.9	0.77

Table 3: highlights the average involvement of librarians in various digital resource management tasks.

FREQUENCY OF DIGITAL LITERACY INSTRUCTION

Instruction Type	Weekly (%)	Monthly (%)	Occasionally (%)	Never (%)
Introduction to Digital Databases	45	30	15	10
Evaluating Online Sources	40	25	20	15

Table 4: Frequency of Digital Literacy Instruction Provided by Librarians

Instruction Type	Weekly (%)	Monthly (%)	Occasionally (%)	Never (%)
Data Privacy and Ethical Use	20	25	30	25
Citation and Research Tools Training	35	30	20	15

Interpretation of Table 4: The data shows that 45% of librarians conduct database instruction weekly, while training on data privacy and ethical use occurs less frequently, with 25% of librarians never addressing this topic. This indicates a potential area for improvement in digital literacy instruction.

TECHNOLOGY-BASED USER SUPPORT

Technology Support Task	Mean Frequency (1-5)	Standard Deviation
Database Navigation	4.4	0.67
Citation Management Software Assistance	4.0	0.74
Troubleshooting Access Issues	4.1	0.71
Assisting with Digital Tools (e.g., R, SPSS)	3.6	0.80

Table 5: Types of Technology Support Provided by Librarians

CORRELATION ANALYSIS

Variable	Digital Competency Score	Perceived Effectiveness Score	Correlation Coefficient (r)
Digital Literacy Instruction	3.9	4.1	0.65**
Digital Resource Management	4.2	4.3	0.72**
Technology-Based User Support	4.1	4.4	0.69**

Table 6: Correlation between Digital Competency and Perceived Effectiveness

Pearson correlation analysis revealed a positive correlation (r = 0.65, p < 0.01) between digital skills proficiency and perceived effectiveness in supporting academic research. This correlation suggests that librarians who reported higher levels of digital skills felt more capable of meeting the needs of academic users effectively.

ADDITIONAL FINDINGS

The survey also indicated that 78% of librarians perceive their role as significantly transformed over the past five years, with most attributing this shift to increased digital responsibilities. Additionally, 62% expressed a need for additional training to keep up with evolving digital tools.

DISCUSSION

INTERPRETATION OF FINDINGS

The data support the hypothesis that librarians' roles have expanded in the digital age, with significant involvement in digital resource management, technology-based user support, and, to a lesser degree, digital literacy skills instruction. The positive correlation between digital skills proficiency and perceived effectiveness highlights the critical role of digital competencies in fulfilling the expectations of modern academic libraries. The data demonstrate that digital skills are essential and critical to librarians' perceived effectiveness. This finding supports existing literature that give emphasis to the significance of digital skills in modern academic libraries (Julien, & Williamson, 2019). Notably, the strong correlation

between digital skills proficiency and perceived effectiveness highlights the importance of digital skills in the librarian's role.

INSTITUTIONAL DIFFERENCES
The comparative data (Table 5), dissimilarities across academic institution types reveal that librarians at research universities tend to engage more heavily in digital resource management and technology-based support. This may reflect the higher demands for research support at these institutions compared to community colleges, where user support responsibilities are less frequent.

DIGITAL COMPETENCY AND EFFECTIVENESS
The correlation analysis (Table 6) highlights that librarians who score higher in digital competencies are also perceived as more effective in their roles. This supports findings by Johnson (2020) that digital skills are critical in the academic context.

LIMITATIONS OF THE STUDY
The study's reliance on self-reported data may introduce response bias, as librarians might overestimate their digital skills. Moreover, the sample was limited to academic libraries in one region, which may not fully represent the diversity of librarians' experiences nationally. The findings may not also generalize to public or special libraries

CONCLUSION
This study demonstrates and quantifies the transformative impact of the digital age on librarians' roles, highlighting their involvement in managing digital resources, offering digital literacy instruction, and providing technology-based support. Results reveal that digital skills are crucial for librarians' effectiveness, particularly in universities where demands for digital resource management and user support are high. Libraries should prioritize ongoing training to equip librarians with the digital skills needed to meet evolving academic demands.

As academic libraries adapt to the digital era, supporting librarians with continuous digital skills training will be essential. Future research should continue exploring how academic libraries can best support librarians in their expanding digital roles to enhance academic community engagement and support.

RECOMMENDATIONS
These findings suggest that as digital proficiency correlates with librarians' effectiveness in their roles, academic libraries should prioritize digital skills training for their staff. Libraries can consider implementing continuous professional development programs focusing on emerging digital tools and information literacy frameworks to better meet user needs. In addition, academic libraries should consider the following recommendations:

- **Increase Digital Literacy Instruction:** Given the moderate scores for digital literacy instruction frequency, especially in data privacy and ethical use (Table 4), more resources should be allocated for training librarians to deliver these critical skills.
- **Customized Training by Institution Type:** Libraries in different types of institutions have varying demands. Research universities, for example, may benefit from advanced training in digital tools, while community colleges could focus on foundational digital literacy.

FUTURE RESEARCH RECOMMENDATIONS
Future studies could use a mixed-methods approach to capture both quantitative data on digital competencies and qualitative insights into librarians' experiences with digital challenges. A longitudinal study could also provide insight into how the role of academic librarians evolves over time as technology advances.

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