Evaluating AI Literacy in Academic Libraries: A Survey Study with a Focus on U.S. Employees

Leo S. Lo

This survey investigates artificial intelligence (AI) literacy among academic library employees, predominantly in the United States, with a total of 760 respondents. The findings reveal a modest self-rated understanding of AI concepts, limited hands-on experience with AI tools, and notable gaps in discussing ethical implications and collaborating on AI projects. Despite recognizing the benefits, readiness for implementation appears low among participants. Respondents emphasize the need for comprehensive training and the establishment of ethical guidelines. The study proposes a framework defining core components of AI literacy tailored for libraries. The results offer insights to guide professional development and policy formulation as libraries increasingly integrate AI into their services and operations.

Introduction

In a world increasingly dictated by algorithms, artificial intelligence (AI) is not merely a technological phenomenon, it is a transformative force that redefines our intellectual, social, and professional landscapes (McKinsey and Company, 2023). The rapid integration of AI in our everyday lives has profound implications for higher education, a sector entrusted with preparing individuals to navigate, contribute to, and thrive in this AI-driven era. From personalized learning environments to automated administrative tasks, AI's influence in higher education is omnipresent and its potential boundless. However, this potential can only be harnessed effectively if those at the frontline of academia—our educators, researchers, administrators, and, notably, academic library employees—are equipped with the necessary AI literacy (UNESCO, 2021). Without an understanding of AI's principles, capabilities, and ethical considerations, higher education risks falling prey to AI's pitfalls rather than leveraging its benefits.

The potential risks and benefits underscore a pressing need to scrutinize and elevate AI literacy within the higher education community—a task that begins with understanding its current state. As facilitators of information and knowledge, academic library employees stand at the crossroads of this AI revolution, making their AI literacy an imperative, not a choice, for the future of higher education.

AI Literacy: Context and Background

In an era marked by exponential growth in digital technology, the concept of literacy has evolved

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beyond traditional reading and writing skills to encompass a wide array of digital competencies. One such competency, which is gaining critical importance in higher education, is AI literacy. With AI systems beginning to permeate every facet of university operations—from learning management systems to research analytics—the ability to understand and navigate these AI tools has become an essential skill for academic library employees.

AI literacy, a subset of digital literacy, specifically pertains to understanding AI's principles, applications, and ethical considerations. It involves not only the ability to use AI tools effectively, but also the capacity to evaluate their outputs critically, to understand their underlying mechanisms, and to contemplate their ethical and societal implications. AI literacy is not just for computer professionals; as Lo (2023b) and Cetindamar et al. (2022) emphasize, operationalizing AI literacy for non-specialists is essential.

The significance of AI literacy in higher education is underscored by several contemporary trends and challenges. Companies and governments globally are engaged in fierce competition to stay at the forefront of AI integration. Concurrently, the rapid proliferation of AI is giving rise to a host of ethical and privacy concerns that require informed stewardship (Cox, 2022). Furthermore, the COVID-19 pandemic has accelerated the digital transformation of higher education, leading to an increased reliance on AI technologies for remote learning and operations. This reliance further points to the necessity of AI literacy among academic library employees, who play a pivotal role in facilitating online learning and research.

As artificial intelligence proliferates across higher education, developing AI literacy is increasingly recognized as a priority to prepare students, faculty, staff, and administrators to harness AI's potential, while mitigating risks (Ng et al., 2021). Hervieux and Wheatley's (2021) 2019 study (n=163) found that academic librarians require more training regarding artificial intelligence and its potential applications in libraries. The U.S. Department of Education's recent report (2023) on AI emphasizes the growing importance of AI literacy for educators and students, highlighting the necessity of understanding and integrating AI technologies in educational settings. This report aligns with the broader discourse on AI literacy and emphasizes the need to equip library professionals with skills needed to evaluate and utilize AI tools effectively (Lo, 2023a).

While efforts to promote AI literacy are growing, the required content for different target groups remains ambiguous. Some promising measurement tools have been proposed, such as Pinski and Benlian's (2023) multidimensional scale assessing perceived knowledge of AI technology, processes, collaboration, and design. However, further validation of AI literacy assessments is required. Developing rigorous definitions and measurements is crucial for implementing effective AI literacy initiatives.

Ridley and Pawlick-Potts (2021) put forth the concept of algorithmic literacy, involving understanding algorithms and their influence, recognizing their uses, assessing their impacts, and positioning individuals as active agents rather than passive recipients of algorithmic decision-making. They propose libraries can contribute to algorithmic literacy by integrating it into information literacy education and supporting explainable AI.

Ocaña-Fernández et al. (2019) argued curriculum and skills training changes are critical to prepare students and faculty for an AI future, though also warn about digital inequality issues. Laupichler et al.'s (2022) scoping review reveals efforts to teach foundational AI literacy to non-specialists are still in formative stages. Proposed essential skills vary considerably across frameworks, and robust evaluations of AI literacy programs are lacking. Findings indicate

that carefully designed AI literacy courses show promise for knowledge gains; however, research substantiating appropriate frameworks, core competencies and effective instructional approaches for diverse audiences remains an open need.

Within libraries, Heck et al. (2019) discussed the interplay of information literacy and AI. They propose that AI could aid information literacy teaching through timely feedback and tracking skill development, but note that common evaluation approaches would need establishing first. Information literacy empowers learners to actively engage with, not just passively consume from, AI systems. Lo (2023c) proposed a framework to utilize prompt engineering to enhance information literacy and critical thinking skills.

Oliphant (2015) examined intelligent agents for library reference services. The analysis found they rapidly retrieve information but lack human evaluation abilities. Findings suggest librarians will need to guide users in critically evaluating AI-generated results, indicating that information literacy instruction remains crucial. Furthermore, Lund et al. (2023) discuss the ethical implications of using large language models, such as ChatGPT, in scholarly publishing, emphasizing the need for ethical considerations and the potential impact of AI on research practices.

While research is still emerging, initial findings highlight the need for rigorous, tailored AI literacy initiatives encompassing technical skills, critical perspectives, and ethical considerations. As AI becomes further entwined with education and work, developing validated frameworks, assessments, and instructional approaches to enhance multidimensional AI literacy across contexts and roles is an urgent priority. This study seeks to contribute by investigating AI literacy specifically among academic library employees.

Purpose of the Study

The rapid pace of AI development and integration in higher education heightens the need to address this research gap. As AI continues to evolve and permeate further into academic libraries, the demand for AI-literate library employees will only increase. Failure to understand the current state of AI literacy, and to identify the gaps, could result in a significant skills deficit that would impedes the effective utilization of AI in academic libraries.

In light of this, the purpose of this study is to embark on an investigation of AI literacy among academic library employees. The study seeks to answer the following critical research questions:

1. What is the current level of AI literacy among academic library employees?
2. What gaps exist in their AI literacy, and how can these gaps be addressed through professional development and training programs?
3. What are their perceptions of generative AI, and what implications do they foresee for the library profession?

By addressing these questions, this study aims to fill a research gap and provide insights that can inform policy and practice in higher education. It strives to shed light on the competencies that academic library employees possess, identify the gaps that need to be addressed, and propose strategies for enhancing AI literacy among this essential group of higher education professionals.

Theoretic Framework

The Technological Pedagogical Content Knowledge (TPACK) framework developed by Mishra and Koehler (2006) serves as the theoretical foundation for this study. TPACK has also been advocated as a useful decision-making structure for librarians evaluating instructional technologies (Sobel & Grotti, 2013).

Mishra and Koehler (2006) explain that TPACK involves flexible, context-specific application of technology, pedagogy, and content knowledge. It goes beyond isolated knowledge of the concepts to an integrated understanding. TPACK development requires moving past viewing technology as an "add-on" and focusing on the connections between technology, content, and pedagogy in particular educational contexts.

In the context of this study, the researcher applied the TPACK framework to examine AI literacy specifically among academic library professionals. The three key components of the TPACK framework are interpreted as:

1. Technological Knowledge (TK)—Knowledge about AI itself, including its principles, capabilities, and limitations. This encompasses understanding AI as a technology and its potential applications in library settings.
2. Pedagogical Knowledge (PK)—Knowledge about how AI can be used to enhance library services and facilitate learning. This relates to understanding how AI can be integrated into library services to improve user experience, streamline operations, and support learning.
3. Content Knowledge (CK)—Knowledge about the library's content and services. This involves perceiving the potential impact of AI on the library's content and services, and how AI can enhance their management and delivery.

This tailored application of the TPACK framework will allow a multidimensional assessment of AI literacy among academic library employees. It facilitates examining employees' understanding of AI as a technology (TK), perceptions of how AI can enhance library services (PK), and the potential impact of AI on the library's content and services (CK).

Significance of the Study

The significance of this study lies in its potential to contribute to academic library policy, practice, and theory in several ways. Firstly, it utilizes the TPACK framework to evaluate AI literacy among academic library employees, identifying competencies, gaps, and necessary strategies. This insight is crucial for designing effective professional development programs, as well as for resource allocation. Secondly, it adds to the discourse on digital literacy in higher education by specifically focusing on AI literacy, aiding in understanding its role and implications. Thirdly, the study provides insights into the ethical, practical, and opportunity dimensions of AI technology integration in libraries, informing best practices and guidelines for its responsible use. Lastly, by applying the TPACK framework to AI literacy in libraries, the study expands its theoretical applications and offers a robust basis for future research in technology integration in academic settings.

Methodology

Research Design

This study employs a survey-based approach to explore AI literacy among academic library employees, chosen for its ability to quickly gather extensive data across a geographically diverse group. The method aligns with the TPACK framework, highlighting the integration of technological, pedagogical, and content knowledge. Surveys facilitate the collection of standardized data, allowing for comparisons across different roles and demographics. This design is particularly effective for descriptive research in higher education, making it suitable for assessing the current state of AI literacy in academic libraries.

Participants

The researcher utilized a comprehensive approach to recruit a diverse group of academic library employees for the survey. This involved posting on professional listservs across various roles and regions in librarianship (Appendix A), as well directly contacting directors of prominent library associations: the Association of Research Libraries (ARL), the Greater Western Library Alliance (GWLA), and the New Mexico Consortium of Academic Libraries (NMCAL). These organizations represent a broad spectrum of academic libraries in terms of size, location, and type. The directors were requested to share the survey with their staff, thus ensuring a wide-reaching and representative sample for the study.

Data Collection

Data collection was facilitated through a custom-designed survey instrument, which was built and administered using the Qualtrics platform (Appendix B). The survey itself was developed to address the study's research questions and was structured into four main sections, each focusing on a specific aspect of AI literacy among academic library employees.

The first section sought to capture respondents' understanding and knowledge of AI, including their familiarity with AI concepts and terminology. The second section focused on respondents' practical skills and experiences with AI tools and applications in professional settings. The third section aimed to identify areas of AI literacy where respondents felt less confident, signaling potential gaps in knowledge or skills that could be addressed through professional development initiatives. Finally, the last section explored respondents' perspectives on the ethical implications and challenges presented by AI technologies in the library context.

The survey employed a mix of question types to engage respondents and capture nuanced data. These included Likert-scale questions, multiple choice, and open-ended questions. Prior to the full-scale administration, the survey was pilot-tested with a small group of academic library employees to ensure clarity, relevance, and appropriateness of the questions.

The survey questions were designed to tap into different dimensions of the TPACK framework. For instance, questions asking about practical experiences with AI tools and self-identified areas of improvement indirectly assess the intersection of technological and pedagogical knowledge (TPK), as they relate to AI.

Upon finalizing the survey, an invitation to participate, along with a link to the survey, was distributed via the listservs and direct outreach methods. The survey remained open for two weeks, with reminders sent out at regular intervals to maximize the response rate.

Limitations

While the study offers insights into AI literacy among academic library employees, it is crucial to acknowledge its limitations. Firstly, given the survey's self-report nature, the findings may be subject to social desirability bias, where respondents might have over- or under-estimated their knowledge or skills in AI.

Secondly, despite best efforts to reach a wide range of academic library employees, the sample may not be entirely representative of the population. The voluntary nature of participation, coupled with the distribution methods used, may have skewed the sample towards those with an existing interest or engagement in AI.

Moreover, while the use of professional listservs and direct outreach to library directors helped widen our reach, this strategy might have excluded those academic library employ-

ees who are less active, or not included, in these communication channels. The inclusion of Canadian libraries through the Association of Research Libraries suggests a small number of non-U.S. respondents.

Finally, the rapidly evolving nature of AI and its applications in libraries means that our findings provide a snapshot at a specific point in time. As AI continues to advance and integrate more deeply into academic libraries, the landscape of AI literacy among library employees is likely to shift, necessitating ongoing research in this area.

These limitations, while important to note, do not invalidate our findings. Instead, they offer points of consideration for interpreting the results and highlight areas for future research to build on our understanding of AI literacy among academic library employees.

Results and Analysis

Descriptive Statistics

The survey drew a diverse response: 760 participants started the survey, 605 completed it. The participants represented a cross-section of the academic library landscape, with the majority (45.20%) serving in Research Universities. A significant proportion also hailed from institutions offering both graduate and undergraduate programs (29.64%) and undergraduate-focused Colleges or Universities (10.76%). Community Colleges and specialized professional schools (e.g., Law, Medical) were represented as well, albeit to a lesser extent.

Over half of the respondents (61.25%) were from libraries affiliated with the Association of Research Libraries (ARL), signifying an extensive representation from research-intensive institutions. Respondents were predominantly from larger academic institutions. Those serving in institutions with enrollments of 30,000 or more made up the largest group (30.67%), closely followed by those in institutions with enrollments ranging from 10,000 to 29,999 (34.66%).

As for professional roles, the survey drew heavily from the library specialists or professionals (60.99%) who directly support the academic community's research, learning, and teaching needs. Middle (20.00%) and senior (9.09%) management personnel were also well-represented, providing a leadership perspective to the survey insights.

TABLE 1
Role or Position in Organization

Role or Position in Organization	Percentage of Respondents	Number of Respondents
Senior management (e.g. Director, Dean, associate dean/director)	9.09%	55
Middle management (e.g. department head, supervisor, coordinator)	20.00%	121
Specialist or professional (e.g., librarian, analyst, consultant)	60.99%	369
Support staff or administrative	8.93%	54
Other	0.99%	6
Total	**100.00%**	**605**

Most of the respondents were primarily involved in Reference and Research Services (25.17%) or Library Instruction and Information Literacy (24.34%)—two areas integral to the academic support infrastructure.

In terms of professional experience, participants exhibited a broad range, from novices with less than a year's experience (2.81%) to seasoned veterans with over 20 years in the field (22.68%).

TABLE 2
Primary Work Area in Academic Librarianship

Primary Work Area in Academic Librarianship	Percentage of Respondents	Number of Respondents
Administration or management	10.93%	66
Reference and research services	25.17%	152
Technical services (e.g., acquisitions, cataloging, metadata)	8.11%	49
Collection development and management	4.64%	28
Library instruction and information literacy	24.34%	147
Electronic resources and digital services	4.30%	26
Systems and IT services	3.64%	22
Archives and special collections	3.31%	20
Outreach, marketing, and communications	1.66%	10
Other	13.91%	84
Total	**100.00%**	**604**

TABLE 3
Years of Experience as a Library Employee

Years of Experience as a Library Employee	Percentage of Respondents	Number of Respondents
Less than 1 year	2.81%	17
1–5 years	21.19%	128
6–10 years	19.54%	118
11–15 years	19.04%	115
16–20 years	14.74%	89
More than 20 years	22.68%	137
Total	**100.00%**	**604**

The survey group was highly educated, with most holding a master's degree in library and information science (65.51%), and a significant number having completed a doctoral degree or a master's in another field.

The survey also collected demographic information. A substantial majority identified as female (71.97%), and the largest age group was 35–44 years (27.97%). While the majority identified as White (76.11%), other ethnicities, including Asian, Black or African American, and Hispanic or Latino, were also represented.

This diverse participant profile offers a broad-based view of AI literacy in the academic library landscape, setting the stage for insightful findings and discussions.

TABLE 4
Level of Understanding of AI Concepts and Principles

Level of Understanding of AI Concepts and Principles	% of Respondents	Number of Respondents
1 (Very Low)	7.50%	57
2	20.13%	153
3 (Moderate)	45.39%	345
4	23.29%	177
5 (Very High)	3.68%	28

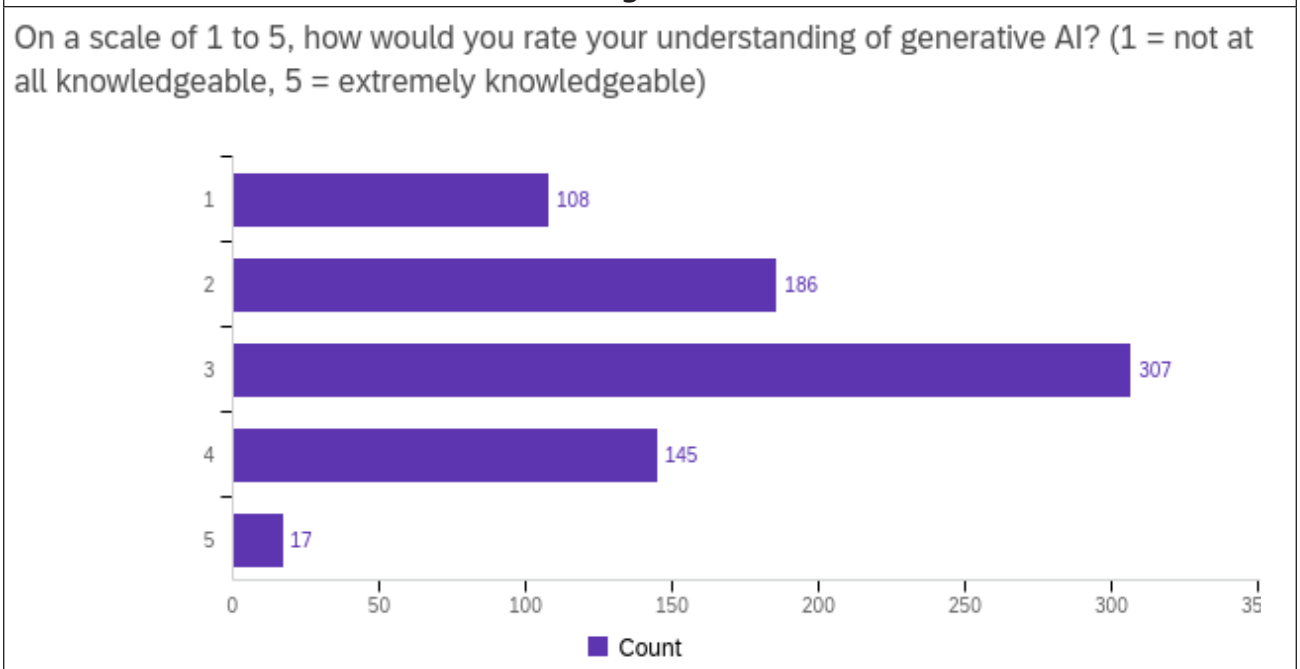
RQ 1 AI Literacy Levels

At a broad level, participants expressed a modest understanding of AI concepts and principles, with a

significant portion rating their knowledge at an average level. However, the number of respondents professing a high understanding of AI was quite small, revealing a potential area for further training and education.

A similar pattern was observed when participants were queried about their understanding of generative AI specifically. This suggests that while librarians have begun to grasp AI and its potential, there is a considerable scope for growth in terms of knowledge and implementation (Figure 1).

FIGURE 1
Understanding of Generative AI



Regarding the familiarity with AI tools, most participants had a moderate level of experience (30.94%). Only a handful of participants reported a high level of familiarity (3.87%), signaling an opportunity for more hands-on training with these tools.

In examining the prevalence of AI usage in the library sector, the researcher found a varied landscape. While some technologies have found significant adoption, others remain relatively unused. Notably, Chatbots and text or data mining tools were the most widely used AI technologies.

Participants' understanding of specific AI concepts followed a similar trend. More straightforward concepts such as Machine Learning and Natural Language Processing had a higher average rating, whereas complex areas like Deep Learning and Generative Adversarial Networks were less understood. This trend underscores the need for targeted educational programs on AI in library settings.

TABLE 5
Understanding of Specific AI Concepts

AI Concept	Average Rating
Machine Learning	2.50
Natural Language Processing (NLP)	2.38
Neural Network	1.93
Deep Learning	1.79
Generative Adversarial Networks (GANs)	1.37

Notably, there was almost a nine percent drop in responses from the previous questions to the questions that asked about the more technical aspects of AI. This could signify a gap in knowledge or comfort level with these topics among the participants.

In the professional sphere, AI tools have yet to become a staple in library work. The majority of participants do not frequently use these tools, with 41.79% never using generative AI tools and 28.01% using them less than once a month. This might be attributed to a lack of familiarity, resources, or perceived need. However, for those who do use them, text generation and research assistance are the primary use cases.

Concerns about ethical issues, quality, and accuracy of generated content, as well as data privacy, were prevalent among the participants. This finding indicates that while there's interest in AI technologies, the perceived challenges are significant barriers to full implementation and adoption.

In their personal lives, AI tools have yet to make a significant impact among the participants. The majority (63.98%) reported using these tools either 'less than once a month' or 'never.' This could potentially reflect the current state of AI integration in non-professional or leisurely activities, and may change as AI continues to permeate our everyday lives.

A chi-square test of independence was performed to examine the relation between the position of the respondent and the understanding of AI concepts and principles. The relation between these variables was significant, $\chi^2(16, N = 760) = 26.31$, $p = .05$. This means that the understanding of AI concepts and principles varies depending on the position of the respondent.

The distributions suggest that—while there is a significant association between the position of the respondent and their understanding of AI concepts and principles—the majority of respondents across all positions have a moderate understanding of AI. However, there are differences in the proportions of respondents who rate their understanding as high or very high, with Senior Management and Middle Management having higher proportions than the other groups.

There is also a significant relation between the area of academic librarianship and the understanding of AI concepts and principles, $\chi^2(36, N = 760) = 68.64$, $p = .00084$. This means that the understanding of AI concepts and principles varies depending on the area of academic librarianship. The distributions show that there are differences in the proportions of respondents who rate their understanding as high or very high, with Administration or management and Library Instruction and Information Literacy having higher proportions than the other groups.

Furthermore, a Chi-Square test shows that the relation between the payment for a premium version of at least one of the AI tools and the understanding of AI concepts and principles is significant, $\chi^2(4, N = 539) = 85.42$, $p < .001$. The distributions suggest that respondents who have paid for a premium version of at least one of the AI tools have a higher understanding of AI concepts and principles compared to those who have not. This could be because those who have paid for a premium version of an AI tool are more likely to use AI in their work or personal life, which could enhance their understanding of AI. Alternatively, those with a higher understanding of AI might be more likely to see the value in paying for a premium version of an AI tool.

It's important to note that these findings are based on the respondents' self-rated understanding of AI, which may not accurately reflect their actual understanding. Further research could involve assessing the respondents' understanding of AI through objective measures.

Additionally, other factors not considered in this analysis, such as the respondent's educational background, years of experience, and exposure to AI in their work, could also influence their understanding of AI.

RQ2 Identifying Gaps

In this section, the researcher delved deeper into the gaps in knowledge and confidence among academic library professionals regarding AI applications. These gaps highlight the urgent need for targeted professional development and training in AI literacy.

Confidence Levels in Various Aspects of AI

The survey data pointed to moderate levels of confidence across a spectrum of AI-related tasks, indicating room for growth and learning. For evaluating ethical implications of using AI, a modest 30.12% of respondents felt somewhat confident (levels 4 and 5 combined), while 29.50% were not confident (levels 1 and 2 combined), and the largest group (39.38%) remained neutral.

Discussing AI integration revealed similar patterns. Here, 31.1% reported high confidence, 34.85% expressed low confidence, and the remaining 33.06% were neutral. These distributions suggest an overall hesitation or lack of assurance in discussing and ethically implementing AI, potentially indicative of inadequate training or exposure to these topics.

When it came to collaborating on AI-related projects, fewer respondents (31.39%) felt confident, while 40.16% reported low confidence, and 28.46% chose a neutral stance. This might point to the necessity of not only individual proficiency in AI but also the need for collaborative skills and shared understanding among teams working with AI.

Troubleshooting AI tools and applications emerged as the most significant gap, with 69.76% rating their confidence as low and only 10.9% expressing high confidence. This highlights an essential area for targeted training, as troubleshooting is a fundamental aspect of successful technology implementation.

TABLE 6
Confidence Levels in Various Aspects of AI

Aspect	% at Confidence Level 1	% at Confidence Level 2	% at Confidence Level 3	% at Confidence Level 4	% at Confidence Level 5
Evaluating Ethical Implications of AI	12.48%	17.02%	39.38%	24.64%	6.48%
Participating in AI Discussions	13.29%	21.56%	33.06%	20.75%	11.35%
Collaborating on AI Projects	15.77%	24.39%	28.46%	21.63%	9.76%
Troubleshooting AI Tools	41.79%	27.97%	19.35%	9.76%	1.14%
Providing Guidance on AI Resources	25.65%	24.51%	25.81%	20.13%	3.90%

Reflecting on Professional Development and Training in AI

Approximately one-third of survey participants have engaged in AI-focused professional development, showcasing several key themes:

- Modes of Training: Librarians access training via various formats, including webinars, workshops, and self-guided learning. Online options are popular, providing accessibility for diverse professionals.

- AI Tools and Applications: Training sessions mainly introduce tools like ChatGPT and others, with an emphasis on functionality and applications in academia.
- Ethical Implications: Sessions often address ethical concerns such as bias and privacy, and the potential misuse of 'black box' AI models.
- Integration into Librarian Workflows: Programs explore AI's integration into library work, including instruction, cataloging, and citation analysis.
- AI Literacy: There is a recurring focus on understanding and teaching AI concepts, tied to broader information literacy discussions.
- AI in Instruction: Training includes using AI tools in library instruction and understanding its impacts on academic integrity.
- Community of Practice: Responses highlight collaborative learning, suggesting a communal approach to understanding AI's challenges and opportunities.
- Self-guided Learning: Some librarians actively pursue independent learning opportunities, reflecting a proactive stance on AI professional development.

The findings emphasize the multifaceted nature of AI in libraries, underlining the need for ongoing, comprehensive professional development. This includes addressing both technical and ethical aspects, equipping librarians with practical AI skills, and fostering a supportive community of practice.

A Chi-square test examining the relationship between the respondents' positions and their participation in any training focused on generative AI ($\chi^2(4, N = 595) = 26.72$, $p < .001$) indicates a significant association. Upon examining the data, the proportion of respondents who have participated in training or professional development programs focused on generative AI is highest among those in Senior Management (47.27%), followed by Specialist or Professional (37.40%), Middle Management (29.75%), and Other (16.67%). The proportion is lowest among Support Staff or Administrative (3.70%).

This suggests that individuals in higher positions, such as Senior Management and Specialist or Professional roles, are more likely to have participated in training or professional development programs focused on generative AI. This could be due to a variety of reasons, such as these roles potentially requiring a more in-depth understanding of AI and its applications, or these individuals having more access to resources and opportunities for such training. On the other hand, Support Staff or Administrative personnel are less likely to have participated in such programs, which could be due to less perceived need or fewer opportunities for training in these roles.

These findings highlight the importance of providing access to training and professional development opportunities focused on AI across all roles in an organization, not just those in higher positions or those directly involved in AI-related tasks. This could help ensure a more widespread understanding and utilization of AI across the organization.

Despite these efforts, many participants did not feel adequately prepared to utilize generative AI tools professionally. A notable 62.91% disagreed to some extent with the statement: "I feel adequately prepared to use generative AI tools in my professional work as a librarian," underscoring the need for more effective training programs.

Interestingly, the areas identified for further training weren't just about understanding the basics of AI. Participants showed a clear demand for advanced understanding of AI concepts and techniques (13.53%), familiarity with AI tools and applications in libraries (14.21%), and addressing privacy and data security concerns related to generative AI (14.36%). This

suggests that librarians are looking to move beyond a basic understanding and are keen to engage more deeply with AI.

Preferred formats for professional development opportunities leaned towards remote and flexible learning opportunities, such as online courses or webinars (26.02%) and self-paced learning modules (22.44%). This preference reflects the current trend towards digital and remote learning, providing a clear direction for future training programs.

Notably, almost half of the participants (43.99%) rated the need for academic librarians to receive training on AI tools and applications within the next twelve months as 'extremely important.' This emphasis on urgency indicates a significant and immediate gap to be addressed.

In summary, a deeper analysis of the data reveals a landscape where academic librarians possess moderate to low confidence in understanding, discussing, and handling AI-related tasks, despite some exposure to professional development in AI. This finding indicates the need for more comprehensive, in-depth, and accessible AI training programs. By addressing these knowledge gaps, the library community can effectively embrace AI's potential and navigate its challenges.

RQ 3 Perceptions

The comprehensive results of our survey, as illustrated in Table 7, offer a detailed portrait of librarians' perceptions towards the integration of generative AI tools in library services and operations.

TABLE 7
Perceptions Towards the Integration of Generative AI Tools In Library Services

Statement	1	2	3	4	5
To what extent do you agree or disagree with the following statement: "I believe generative AI tools have the potential to benefit library services and operations." (1 = strongly disagree, 5 = strongly agree)	3.32%	10.96%	35.88%	27.91%	21.93%
How important do you think it is for your library to invest in the exploration and implementation of generative AI tools? (1 = not at all important, 5 = extremely important)	7.24%	15.95%	29.93%	28.78%	18.09%
In your opinion, how prepared is your library to adopt generative AI tools and applications in the next 12 months? (1 = not at all prepared, 5 = extremely prepared)	32.28%	37.75%	23.84%	4.80%	1.32%
To what extent do you think generative AI tools and applications will have a significant impact on academic libraries within the next 12 months? (1 = no impact, 5 = major impact)	2.81%	20.03%	36.09%	26.16%	14.90%
How urgent do you feel it is for your library to address the potential ethical and privacy concerns related to the use of generative AI tools and applications? (1 = not at all urgent, 5 = extremely urgent)	2.15%	5.46%	18.05%	29.47%	44.87%

When considering the potential benefits of AI, the responses indicate a degree of ambivalence, with 35.88% choosing a neutral stance. However, when we combine the categories of those who 'agree' and 'strongly agree,' we see that a significant portion, 49.84%, view AI

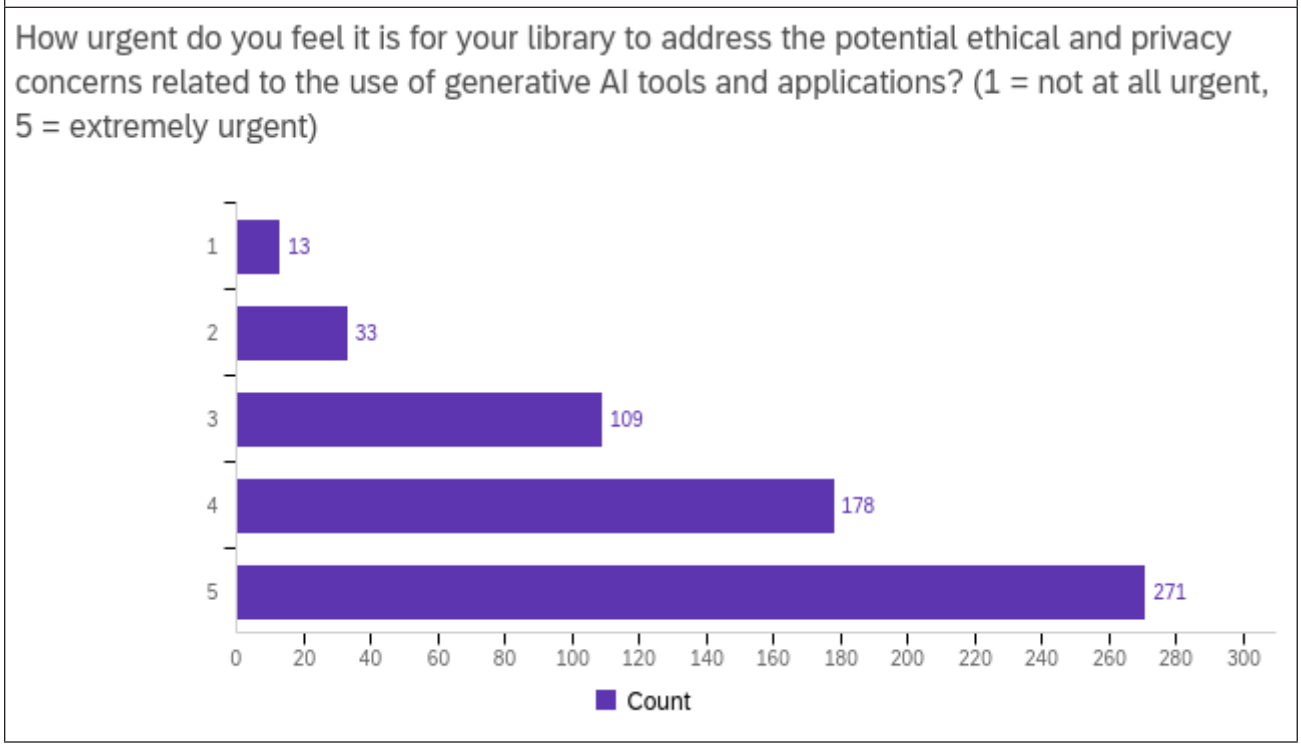
as beneficial to a certain extent. Similarly, on the question of the importance of investment in AI, there is a notable inclination towards agreement, with 46.87% agreeing that investment is important to some degree.

However, this optimism is juxtaposed with concerns about readiness. When asked how prepared they feel to adopt generative AI tools within the forthcoming year, 70.03% of respondents (those who 'strongly disagree' or 'disagree') admit a lack of preparedness. This suggests that despite recognizing the potential value of AI, there are considerable obstacles to be overcome before implementation becomes feasible.

The uncertainty surrounding AI's impact on libraries in the short-term further illuminates this complexity. A significant proportion of librarians (36.09%) chose a neutral response when asked to predict the impact of AI on academic libraries within the next twelve months. Nonetheless, there is a considerable group (41.06% who 'agree' or 'strongly agree') who foresee significant short-term impact.

A key finding from the survey was the collective recognition of the urgency to address ethical and privacy issues tied to AI usage. In fact, 74.34% of respondents, spanning 'agree' and 'strongly agree,' underscored the urgent need to address potential ethical and privacy concerns related to AI, highlighting the weight of responsibility librarians feel in maintaining the integrity of their services in the age of AI (Figure 2).

FIGURE 2
Perceived Urgency for Addressing Ethical and Privacy Concerns of Generative AI in Libraries



The qualitative responses provide a rich understanding of the perceptions of generative AI among library professionals and the implications they foresee for the library profession. The responses were categorized into several key themes, each of which is discussed below with relevant quotes from the respondents.

Themes

Ethical and Privacy Concerns

A significant theme that emerged from the responses was the ethical and privacy concerns associated with the use of generative AI tools in libraries. Respondents expressed apprehension about potential misuse of data and violations of privacy. As one respondent noted, "Library leaders should not rush to implement AI tools without listening to their in-house experts and operational managers." Another respondent cautioned, "We need to be cautious about adopting technologies or practices within our own workflows that pose significant ethical questions, privacy concerns."

Need for Education and Training

The need for education and training on AI for librarians was another prevalent theme. Respondents emphasized the importance of understanding AI tools and their implications before implementing them. One respondent suggested: "quickly education on AI is needed for librarians. As with anything else, there will be early adopters and then a range of adoption over time." Another respondent highlighted the need for an AI specialist, stating, "I also think it would be valuable to have an AI librarian, someone who can be a resource for the rest of the staff."

Potential for Misuse

Respondents expressed concern about the potential for misuse of AI tools, such as generating false citations or over-reliance on AI systems. They emphasized the importance of critical thinking skills, and cautioned against replacing human judgment and learning processes with AI. As one respondent put it, "Critical thinking skills and learning processes are vital and should not be replaced by AI." Another respondent warned: "there are potential risks from misuse such as false citations being provided or too much dependence on systems."

Concerns about Implementation

Several respondents expressed doubts about the ability of libraries to quickly and effectively implement AI tools. They cited issues such as frequent updates and refinements to AI tools, the need for significant investment, and the potential for AI to be used in ways that do not benefit the library or its users. One respondent noted, "the concern I have with AI tools is the frequent updates and refinements that occur. For libraries with small staff size, it seems daunting to keep up."

Role of AI in Libraries

Some respondents suggested specific ways in which AI could be used in libraries, such as for collection development, instruction, and answering frequently asked questions. However, they also cautioned against viewing AI as a panacea for all library challenges. One respondent stated: "using them for FAQs will be more useful than answering a complicated reference question."

Concerns about AI's Impact on the Profession

Some respondents expressed concern that the use of AI could lead to job displacement or a devaluation of the human elements of librarianship. They suggested that AI should be used to

complement, not replace, human librarians. One respondent expressed that, "I could see a future where only top research institutions have human reference librarians as a concierge service."

Need for Critical Evaluation

Respondents emphasized the need for critical evaluation of AI tools, including understanding their limitations and potential biases. They suggested that libraries should not rush to implement AI without fully understanding its implications. One respondent advised: "the framing of AI usage as a forgone conclusion is concerning. It's a tool, not a solution, and should not be implemented without due consideration."

AI Literacy

Some respondents suggested that libraries have a role to play in teaching AI literacy to students and other library users. They emphasized the importance of understanding how AI tools work and how to use them responsibly. One respondent stated: "I think we need to teach AI literacy to students." Another respondent echoed this sentiment, saying, "it is essential that we prepare our students to use generative AI tools responsibly."

The perceptions of generative AI among library professionals are multifaceted, encompassing both the potential benefits and challenges of these technologies. While there is recognition of the potential of AI to enhance library services, there is also a strong emphasis on the need for ethical considerations, education and training, critical evaluation, and responsible use of these tools. The implications for the library profession are significant, with concerns about job displacement, the need for new skills and roles, and the potential for changes in library practices and services. These findings highlight the need for ongoing dialogue and research on the use of generative AI in libraries.

While library employees acknowledge the potential advantages of AI in library services, they also express concerns regarding readiness, and emphasize the urgency to address ethical and privacy considerations. These findings indicate the need for support systems, training, and resources to address readiness gaps, alongside rigorous discussion, and guidelines to navigate ethical and privacy issues as libraries explore the possibilities of AI integration.

Discussions

The survey results cast light on the current state of artificial intelligence literacy, training needs, and perceptions within the academic library community. The findings reveal a landscape of recognition for the potential of AI technologies, yet, simultaneously, a lack of in-depth understanding and preparedness for their adoption.

A detailed examination of the data reveals that a considerable number of library professionals self-assess their understanding of AI as sitting around, or below, the middle. While this does suggest a basic level of familiarity with AI concepts and principles, it likely falls short of the proficiency required to navigate the rapidly evolving AI landscape confidently and competently. This gap in understanding holds implications for the library field as AI continues to infiltrate various sectors and increasingly permeates library services and operations.

Moreover, an analysis of the familiarity of library professionals with AI tools lends further credence to this call for more comprehensive AI education initiatives. An understanding of AI extends beyond mere theoretical comprehension—it necessitates hands-on familiarity with AI tools and the ability to use and apply them in practice. Direct interaction with AI technologies

provides an avenue for library professionals to bolster their practical understanding and thus equip them to incorporate these tools into their work more effectively.

However, formulating training initiatives that address these gaps is a multifaceted task. The AI usage in libraries is as diverse as the scope of AI applications themselves. From customer service chatbots, and text or data mining tools, to advanced technologies like neural networks and deep learning systems—each offers unique applications and therefore requires distinct expertise and understanding. Accordingly, training programs must be flexible and comprehensive, encompassing the full range of potential AI applications while also delving deep enough to provide a solid grasp of each specific tool's functionality and potential uses.

The study also sheds light on the varying degrees of understanding across different AI concepts. Participants generally exhibited a higher level of comprehension for simpler AI concepts. However, their understanding waned when it came to more complex concepts, often the bedrock of cutting-edge AI applications. This variation in comprehension underscores the need for a stratified approach to AI education. Such an approach could start with foundational concepts and gradually progress towards more advanced topics, providing a scaffold on which a deeper understanding of AI can be built.

Addressing the AI literacy gap in the library sector thus requires a concerted approach—one that offers comprehensive and layered educational strategies that bolster both theoretical understanding and practical familiarity with AI. The aim should not only be to impart knowledge, but to empower library professionals to confidently navigate the AI landscape, to adopt and adapt AI technologies in their work effectively and—crucially —responsibly. Through such training and professional development initiatives, libraries can harness the potential of AI, ensuring they continue to be at the forefront of technological advancements.

As the focus shifts to the professional use of AI tools in libraries, the data reveal that their adoption is not yet commonplace. The use of AI tools—such as text generation and research assistance—are most reported, reflecting the immediate utility these technologies offer to librarians. However, a significant proportion of participants do not frequently use AI tools, indicating barriers to adoption. These barriers could include a lack of understanding or familiarity with these tools, a perceived lack of necessity for their use, or limitations in resources necessary for implementation and maintenance. To overcome these barriers, the field may need more than just providing education and resources. Demonstrating the tangible benefits and efficiencies AI tools can bring to library work could play a pivotal role in their wider adoption.

The data show a strong enthusiasm among librarians for professional development related to AI. While introductory training modalities are popular, the findings reveal a demand for more advanced, hands-on training. This need aligns with the complexity and rapid evolution of AI technologies, which require a deeper understanding to be fully leveraged in library contexts.

Furthermore, the findings highlight the importance of ethical considerations and the potential benefits of fostering communities of practice in AI training. With the increasing integration of AI technology into library services, the issues related to AI ethics will likely become more complex. Proactively addressing these concerns through in-depth, focused training can help libraries continue to serve as ethical stewards of information. Communities of practice provide a platform for shared learning, mutual support, and the pooling of resources, equipping librarians to better navigate the intricacies of AI integration.

Importantly, the data show that the diversity in librarians' roles and contexts necessitates a tailored approach to AI training. Libraries differ in their services, target audiences, resources, and strategic goals, and so do their AI training needs. A one-size-fits-all approach to AI training may fall short. Future AI training could therefore take these variations into account, offering specialized tracks or modules catering to specific roles or institutional contexts.

Likewise, the perceptions surrounding the use of generative AI tools in libraries are intricate and multifaceted. While the potential benefits of AI are acknowledged and the importance of investing in its implementation recognized, there is also a pronounced lack of readiness to adopt these tools. This readiness gap could stem from various factors, such as a lack of technical skills, insufficient funding, or institutional resistance. Future research should delve into these possibilities to better understand and address this gap.

Library professionals express uncertainty about the short-term implications of AI for libraries. This could reflect the novelty of these technologies and a lack of clear use cases, or it could echo the experiences of early adopters. The findings also emphasize a heightened sense of urgency in addressing the ethical and privacy concerns associated with AI technologies. These concerns underline the necessity for ongoing dialogue, education, and policy development around AI use in libraries.

Conclusions and Future Directions

The results reveal an intricate landscape of AI understanding, usage, and perception in the library field. While the benefits of AI tools are acknowledged, a comprehensive understanding and readiness to implement these technologies remain less than ideal. This reality underlines the pressing need for an investment in targeted educational strategies and ongoing professional development initiatives.

Crucially, the wide variance in AI literacy, understanding of AI concepts, and hands-on familiarity with AI tools among library professionals points towards the need for a stratified and tailored approach to AI education. Future training programs must aim beyond just knowledge acquisition—they must equip library professionals with the capabilities to apply AI technologies in their roles effectively, ethically, and responsibly. Ethical and privacy concerns emerged as significant considerations in the adoption of AI technologies in libraries. Our findings reinforce the crucial role that libraries have historically played, and must continue to play, in advocating for ethical information practices.

The readiness gap in AI adoption uncovered by the study suggests a disconnect between understanding the potential of AI and the ability to harness it effectively. This invites a deeper investigation into potential barriers, including technical proficiency, resource allocation, and institutional culture, among others.

Framework and Key Competencies

This study presents a framework for defining AI literacy in academic libraries, encapsulating seven key competencies:

1. Understanding AI System Capabilities and Limitations: Recognizing what AI can and cannot do, knowing its strengths and weaknesses.
2. Identifying and Evaluating AI Use Cases: Discovering and assessing potential AI applications in library settings.

3. Utilizing AI Tools Effectively and Appropriately: Applying AI technologies in library operations.
4. Critically Assessing AI Quality, Biases, and Ethics: Evaluating AI for accuracy, fairness, and ethical considerations.
5. Engaging in Informed AI Discussions and Collaborations: Participating knowledgeably in conversations and cooperative efforts involving AI.
6. Recognizing Data Privacy and Security Issues: Understanding and addressing concerns related to data protection and security in AI systems.
7. Anticipating AI's Impacts on Library Stakeholders: Preparing for how AI will affect library users and staff.

This multidimensional definition of AI literacy for libraries provides a foundation for developing comprehensive training programs and curricula. For instance, the need to understand AI system capabilities and limitations highlighted in the definition indicates that introductory AI education should provide a solid grounding in how common AI technologies like machine learning work, where they excel, and their constraints. This conceptual comprehension equips librarians to set realistic expectations when evaluating or implementing AI.

The definition also accentuates that gaining practical skills to use AI tools appropriately should be a core training component. Hands-on learning focused on identifying appropriate applications, utilizing AI technologies effectively, and critically evaluating outputs can empower librarians to harness AI purposefully.

Moreover, emphasizing critical perspectives and ethical considerations reflects that AI training for librarians should move beyond technical proficiency. Incorporating modules examining biases, privacy implications, misinformation risks, and societal impacts is key for fostering responsible AI integration.

Likewise, the collaborative dimension of the definition demonstrates that cultivating soft skills for productive AI discussions and teamwork should be part of the curriculum. AI literacy has an important social element that training programs need to nurture.

Overall, this definition provides a skills framework that can inform multipronged, context-sensitive AI training tailored to librarians' diverse needs. It constitutes an actionable guide for developing AI curricula and professional development that advance both technical and social aspects of AI literacy.

Future Research

Based on the findings and limitations of the current study, the following are specific recommendations for future research:

1. Longitudinal Studies: This study provides a snapshot of AI literacy among academic library employees at a specific point in time. Future research could conduct longitudinal studies to track changes in AI literacy over time, which would provide insights into the effectiveness of interventions and the evolution of AI literacy in the library profession.
2. Comparative Studies: This study focused on academic library employees. Future research could conduct comparative studies to examine AI literacy among different types of library employees (e.g., public library employees, school library employees), or among library employees in different countries. Such studies could provide insights into the factors that influence AI literacy and the strategies that are effective in different contexts.

3. Intervention Studies: This study identified the need for education and training on AI. Future research could design and evaluate interventions aimed at enhancing AI literacy among library employees. Such studies could provide evidence-based recommendations for the development of training programs and resources.
4. Ethical Considerations: This study highlighted ethical concerns about the use of AI in libraries. Future research could delve deeper into these ethical issues, examining the perspectives of different stakeholders (e.g., library users, library administrators) and exploring strategies for addressing these concerns.
5. Impact of AI on Library Services: This study explored library employees' perceptions of the potential impact of AI on library services. Future research could examine the actual impact of AI on library services, assessing the effectiveness of AI in enhancing user experience, streamlining operations, and supporting learning.

By pursuing these avenues for future research, we can continue to deepen our understanding of AI literacy in the library profession, inform strategies for enhancing AI literacy, and promote the effective and ethical use of AI in libraries.

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Appendix A. Recruitment—Listservs

- American Indian Library Association (AILA)
- American Libraries Association (ALA) Members
- Asian Pacific American Librarians Association (APALA)
- Association of College and Research Libraries (ACRL)
  - Members
  - University Libraries Section
  - Distance and Online Learning Section
  - Instruction Section
- Association of Research Libraries (ARL) Directors Listserv
- Black Caucus American Library Association (BCALA)
- Chinese American Librarians Association (CALA)
- Greater Western Library Alliance (GWLA) Directors' listserv
- Minnesota Institute Graduates (MIECL)
- New Mexico Consortium of Academic Libraries (NMCAL) Directors' Listserv
- REFORMA

Appendix B. AI and Academic Librarianship

Survey Flow

Standard: Block 1 (1 Question)
Block: Knowledge and Familiarity (12 Questions)
Standard: Perceived Competence and Gaps in AI Literacy (5 Questions)
Standard: Training on Generative AI for Librarians (6 Questions)
Standard: Desired Use of Generative AI in Libraries (7 Questions)
Standard: Demographic (10 Questions)
Standard: End of Survey (1 Question)
Page Break
Start of Block: Block 1

Q1.1 Introduction

Dr. Leo Lo from the University of New Mexico is conducting a research project. You are invited to participate in a research study aiming to assess AI literacy among academic library employees, identify gaps in AI literacy that require further professional development and training, and understand the differences in AI literacy levels across different roles and demographic factors. Before you begin the survey, please read this Informed Consent Form carefully. Your participation in this study is voluntary, and you may choose to withdraw at any time without any consequences.

Artificial Intelligence (AI) refers to the development of computer systems and software that can perform tasks that would typically require human intelligence. These tasks may include problem-solving, learning, understanding natural language, recognizing patterns, perception, and decision-making

You are being asked to participate based of the following inclusion and exclusion criteria:

Inclusion Criteria:

- Currently employed as an employee in a college or university library setting.
- Willing and able to provide informed consent for participation in the study.

The Exclusion Criteria are as Follows:

- Librarian employees working in non-academic library settings (e.g., public libraries, school libraries, special libraries).
- Individuals who are not currently library employees or who are employed in non-library roles within academic institutions.

Purpose of the Study

The purpose of this study is to evaluate the current AI literacy levels of academic librarians and identify areas where further training and development may be needed. The findings will help inform the design of targeted professional development programs and contribute to the understanding of AI literacy in the library profession.

Procedures

If you agree to participate in this study, you will be asked to complete an online survey that will take approximately 15–20 minutes to complete. The survey includes questions about your AI knowledge, familiarity with AI tools and applications, perceived competence in using AI, and your opinions on training needs.

Potential Risks and Discomforts

There are no known risks or discomforts associated with participating in this study. Some questions might cause minor discomfort due to self-reflection, but you are free to skip any questions you prefer not to answer. Benefits While there are no direct benefits to you for participating in this study, your responses will help contribute to a better understanding of AI literacy among academic librarians and inform the development of relevant professional training programs.

Confidentiality

Your responses will be anonymous, and no personally identifiable information will be collected. Data will be stored securely on password-protected devices or encrypted cloud storage services, with access limited to the research team. The results of this study will be reported in aggregate form, and no individual responses will be identifiable. Your information collected for this project will NOT be used or shared for future research, even if we remove the identifiable information like your name.

Voluntary Participation and Withdrawal

Your participation in this study is voluntary, and you may choose to withdraw at any time without any consequences. Please note that if you decide to withdraw from the study, the data that has already been collected from you will be kept and used. This is necessary to maintain the integrity of the study and ensure that the data collected is reliable and valid.

Contact Information

If you have any questions or concerns about this study, please contact the principal investigator, Leo Lo, at leolo@unm.edu. If you have questions regarding your rights as a research participant, or about what you should do in case of any harm to you, or if you want to obtain information or offer input, please contact the UNM Office of the IRB (OIRB) at (505) 277-2644 or irb.unm.edu

Consent

By clicking "I agree" below, you acknowledge that you have read and understood the information provided above, had an opportunity to ask questions, and voluntarily agree to participate.
I agree (1)
I do not agree (2)
Skip To: End of Survey If Q1.1 = I do not agree
Skip To: End of Survey If Q1.1 = I do not agree
End of Block: Block 1
Start of Block: Knowledge and Familiarity

Q2.1 Artificial Intelligence

(AI) refers to the development of computer systems and software that can perform tasks that would typically require human intelligence. These tasks may include problem-solving, learning, understanding natural language, recognizing patterns, perception, and decision-making

Please rate your overall understanding of **AI concepts and principles** (using a Likert scale, e.g., 1 = very low, 5 = very high)

1 (1)
2 (2)
3 (3)
4 (4)
5 (5)

Q2.2 On a scale of 1 to 5, how would you rate your **understanding of generative AI**? (1 = not at all knowledgeable, 5 = extremely knowledgeable)

1 (1)
2 (2)
3 (3)
4 (4)
5 (5)

Q2.3 Rate your familiarity with **generative AI tools** (e.g., ChatGPT, DALL-E, etc.) (using a Likert scale, e.g., 1 = not familiar, 5 = very familiar)

1 (1)
2 (2)
3 (3)
4 (4)
5 (5)

Page Break

Q2.4 Which of the following AI technologies or applications have you encountered or used in your role as an academic librarian? (Select all that apply)

□ Chatbots (1)
□ Text or data mining tools (2)
□ Recommender systems (3)
□ Image or object recognition (4)
□ Automated content summarization (5)
□ Sentiment analysis (6)
□ Speech recognition or synthesis (7)
□ Other(please specify) (8) _____

Page Break

Q2.5 For each of the following AI concepts, indicate your understanding of the concept by selecting the appropriate response.

	I don't know what it is (1)	I know what it is but can't explain it (2)	I can explain it at a basic level (3)	I can explain it in detail (4)
Machine Learning (1)				
Natural Language Processing (NLP) (2)				
Neural Network (3)				
Deep Learning (4)				
Generative Adversarial Networks (GANs) (5)				

Page Break

Q2.6 Which of the following generative AI tools have you used at least a few times? (Select all that apply)

- □ Text generation (e.g., ChatGPT) (1)
- □ Image generation (e.g., DALL-E, Mid Journey) (2)
- □ Music generation (e.g., OpenAI's MuseNet) (3)
- □ Video generation (e.g. Synthesia) (4)
- □ Presentation generation (e.g. Tome) (5)
- □ Voice generation (e.g. Murf) (6)
- □ Data synthesis for research purposes (7)
- □ Other (please specify) (8) _____

Page Break

Display This Question:
If If Which of the following generative AI tools have you used at least a few times? (Select all that a… q://QID5/SelectedChoicesCount Is Greater Than 0

Q2.7 Have you ever paid for a premium version of at least one of the AI tools (for example, ChatGPT Plus; or Mid Journey subscription plan, etc.)

Yes (1)
No (2)

Page Break

Q2.8 How frequently do you use generative AI tools in your professional work? (Select one)

Daily (1)
Several times per week (2)
Weekly (3)
A few times per month (4)
Monthly (5)
Less than once a month (6)
Never (7)

Page Break

Q2.9 For what purposes do you use generative AI tools in your professional work? (Select all that apply)

□ Content creation (e.g., blog posts, social media updates) (1)
□ Research assistance (e.g., literature reviews, data synthesis) (2)
□ Data analysis or visualization (3)
□ Cataloging or metadata generation (4)
□ User support or assistance (e.g., chatbots, virtual reference) (5)
□ Other (please specify) (6) _____

Page Break

Q2.10 On a scale of 1 to 5, how would you rate **how reliable** generative AI tools have been in fulfilling your professional needs? (1 = not at all reliable, 5 = extremely reliable)
Please explain your choice.

1 (1) _____
2 (2) _____
3 (3) _____
4 (4) _____
5 (5) _____

Page Break

Q2.11 What level of concern do you have for the following potential challenges in implementing generative AI technologies in academic libraries? (Rate each challenge on a scale of 1 to 5, where 1 = not at all concerned and 5 = extremely concerned)

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)
Obtaining adequate funding and resources for AI implementation (1)					
Ethical concerns, such as bias and fairness (2)					
Intellectual property and copyright issues (3)					

Staff resistance or lack of buy-in (4)					
Quality and accuracy of generated content (5)					
Ensuring accessibility and inclusivity of AI tools for all users (6)					
Potential job displacement due to automation (7)					
Data privacy and security (8)					
Technical expertise and resource requirements (9)					
Other (please specify) (10)					

Page Break

Q2.12 How frequently do you use generative AI tools in your **personal life**? (Select one)

Daily (1)
Several times per week (2)
Weekly (3)
A few times per month (4)
Monthly (5)
Less than once a month (6)
Never (7)

End of Block: Knowledge and Familiarity

Start of Block: Perceived Competence and Gaps in AI Literacy

Q3.1 On a scale of 1 to 5, how confident are you in your ability to **evaluate the ethical implications of using AI** in your library? (1 = not at all confident, 5 = extremely confident)

1 (1)
2 (2)
3 (3)
4 (4)
5 (5)

Q3.2 On a scale of 1 to 5, how confident are you in your ability to **participate in discussions about AI integration** within your library? (1 = not at all confident, 5 = extremely confident)

1 (1)
2 (2)
3 (3)
4 (4)
5 (5)

Page Break

Q3.3 On a scale of 1 to 5, how confident are you in your ability to **collaborate with colleagues on AI-related projects** in your library? (1 = not at all confident, 5 = extremely confident)

1 (1)
2 (2)
3 (3)
4 (4)
5 (5)

Q3.4 On a scale of 1 to 5, how confident are you in **your ability to troubleshoot issues related to AI tools and applications** used in your library? (1 = not at all confident, 5 = extremely confident)

1 (1)
2 (2)
3 (3)
4 (4)
5 (5)

Page Break

Q3.5 On a scale of 1 to 5, how confident are you in **your ability to provide guidance to library users about AI resources and tools**? (1 = not at all confident, 5 = extremely confident)

1 (1)
2 (2)
3 (3)
4 (4)
5 (5)

Page Break

End of Block: Perceived Competence and Gaps in AI Literacy
Start of Block: Training on Generative AI for Librarians

Q4.1 Have you ever participated in any training or professional development programs focused on generative AI?

Yes (1)
No (2)

Display This Question:
If Q4.1 = Yes

Q4.2 Please briefly describe the nature and content of the training or professional development program(s) you attended.

_____
_____
_____
_____
_____

Page Break

Q4.3 To what extent do you agree or disagree with the following statement: "**I feel adequately prepared to use generative AI tools in my professional work as a librarian**." (1 = strongly disagree, 5 = strongly agree)

1 (1)
2 (2)
3 (3)
4 (4)
5 (5)

Page Break

Q4.4 In which of the following areas do you feel the need for additional training or professional development related to AI? (Select all that apply)

□ Basic understanding of AI concepts and terminology (1)
□ Advanced understanding of AI concepts and techniques (2)
□ Familiarity with AI tools and applications in libraries (3)
□ Ethical considerations of AI in libraries (4)
□ Collaborating on AI-related projects (5)
□ Addressing privacy and data security concerns related to generative AI (6)
□ Troubleshooting AI tools and applications (7)
□ Providing guidance to library users about AI resources (8)
□ Other (please specify) (9) _____

Page Break

Q4.5 What types of professional development opportunities related to AI would be most beneficial to you? (Select all that apply)

□ Online courses or webinars (1)
□ In-person workshops or seminars (2)
□ Conference presentations or panel discussions (3)
□ Self-paced learning modules (4)
□ Mentoring or coaching (5)
□ Peer learning groups or communities of practice (6)
□ Other (please specify) (7) _____

Page Break

Q4.6 How important do you think it is for academic librarians to **receive training on generative AI tools and applications in the next 12 months**? (1 = not at all important, 5 = extremely important)

1 (1)
2 (2)
3 (3)
4 (4)
5 (5)

End of Block: Training on Generative AI for Librarians
Start of Block: Desired Use of Generative AI in Libraries

Q5.1 To what extent do you agree or disagree with the following statement: "**I believe generative AI tools have the potential to benefit library services and operations**." (1 = strongly disagree, 5 = strongly agree)

1 (1)
2 (2)
3 (3)
4 (4)
5 (5)

Page Break

Q5.2 How important do you think it is for your library to **invest in the exploration and implementation of generative AI tools**? (1 = not at all important, 5 = extremely important)

1 (1)
2 (2)
3 (3)
4 (4)
5 (5)

Page Break

Q5.3 If you have any additional thoughts or suggestions on how your library could or should use (or not use) generative AI tools, please share them here.

_____
_____
_____
_____
_____

Page Break

Q5.4 How soon do you think your library should prioritize implementing generative AI tools and applications? (Select one)

Immediately (1)
Within the next 6 months (2)
Within the next year (3)
Within the next 2–3 years (4)
More than 3 years from now (5)
Not a priority at all (6)

Page Break

Q5.5 In your opinion, **how prepared is your library** to adopt generative AI tools and applications in the next 12 months? (1 = not at all prepared, 5 = extremely prepared)

1 (1)
2 (2)
3 (3)
4 (4)
5 (5)

Page Break

Q5.6 To what extent do you think generative AI tools and applications **will have a significant impact on academic libraries within the next 12 months**? (1 = no impact, 5 = major impact)

1 (1)
2 (2)
3 (3)
4 (4)
5 (5)

Page Break

Q5.7 How urgent do you feel it is for your library to **address the potential ethical and privacy concerns** related to the use of generative AI tools and applications? (1 = not at all urgent, 5 = extremely urgent)

1 (1)
2 (2)
3 (3)
4 (4)
5 (5)

End of Block: Desired Use of Generative AI in Libraries
Start of Block: Demographic

Q6.1 In which type of academic institution is your library located? (Select one)

Community college (1)
College or university (primarily undergraduate) (2)
College or university (graduate and undergraduate) (3)
Research university (4)
Specialized or professional school (e.g., law, medical) (5)
Other (please specify) (6) _____

Q6.2 Is your library an ARL member library?

Yes (1)
No (2)

Page Break

Q6.3 Approximately how many students are enrolled at your institution? (Select one)
- Fewer than 1,000 (1)
- 1,000–4,999 (2)
- 5,000–9,999 (3)
- 10,000–19,999 (4)
- 20,000–29,999 (5)
- 30,000 or more (6)

Page Break

Q6.4 What is your current role or position in your organization? (Select one)
- Senior management (e.g. Director, Dean, associate dean/director) (1)
- Middle management (e.g. department head, supervisor, coordinator) (2)
- Specialist or professional (e.g., librarian, analyst, consultant) (3)
- Support staff or administrative (4)
- Other (please specify) (5) _____

Page Break

Q6.5 In which area of academic librarianship do you primarily work? (Select one)
- Administration or management (1)
- Reference and research services (2)
- Technical services (e.g., acquisitions, cataloging, metadata) (3)
- Collection development and management (4)
- Library instruction and information literacy (5)
- Electronic resources and digital services (6)
- Systems and IT services (7)
- Archives and special collections (8)
- Outreach, marketing, and communications (9)
- Other (please specify) (10) _____

Page Break

Q6.6 How many years of experience do you have as a library employee?
- Less than 1 year (1)
- 1–5 years (2)
- 6–10 years (3)
- 11–15 years (4)
- 16–20 years (5)
- More than 20 years (6)

Page Break

Q6.7 What is the highest level of education you have completed? (Select one)

High school diploma or equivalent (1)
Some college or associate degree (2)
Bachelor's degree (3)
Master's degree in library and information science (e.g., MLIS, MSLS) (4)
Master's degree in another field (5)
Doctoral degree (e.g., PhD, EdD) (6)
Other (please specify) (7) _____

Page Break

Q6.8 What is your gender? (Select one)

Male (1)
Female (2)
Non-binary / third gender (3)
Prefer not to say (4)

Q6.9 What is your age range?

Under 25 (1)
25–34 (2)
35–44 (6)
45–54 (3)
55–64 (4)
65 and above (5)

Page Break

Q6.10 How do you describe your ethnicity? (Select one or more)

□ American Indian or Alaskan Native (1)
□ Asian (2)
□ Black or African American (3)
□ Hawaiian or Other Pacific Islander (4)
□ Hispanic or Latino (5)
□ White (6)
□ Prefer not to say (7)
□ Other (8) _____

End of Block: Demographic
Start of Block: End of Survey

Q7.1 Thank you for participating in our survey!

Your input is incredibly valuable to us and will contribute to our understanding of AI literacy among academic librarians. We appreciate the time and effort you have taken to share your experiences and opinions. The information gathered will help inform future professional development opportunities and address potential gaps in AI knowledge and skills.

We will carefully analyze the responses and share the findings with the academic library community. If you have any further comments or questions about the survey, please do not hesitate to contact us at leolo@unm.edu.

Once again, thank you for your contribution to this important research. Your insights will help shape the future of AI in academic libraries.

Best regards,

Leo S. Lo
University of New Mexico
End of Block: End of Survey