8 Smart Libraries and Smarter Learning: AI's Impact on Academic Services and Pedagogy

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Abstract

Artificial Intelligence (AI) is transforming academic libraries into dynamic centers of personalized learning, work more efficiently, and ethical engagement. This chapter looks at how AI technologies like machine learning, natural language processing, predictive analytics, and virtual assistants are changing the way libraries work and pedagogical roles. The study looks at how librarians' roles are changing as they work to improve AI literacy and make sure everyone can use it. It does this using frameworks like Technological Pedagogical Content Knowledge (TPACK) and Critical Information Literacy. The study looks at how to strategically integrate AI into library services like cataloging, information retrieval, research support, and helping users by using bibliometric data, practitioner experiences, and policy developments. The Indian academic setting is given special attention because of the effects of limited infrastructure, language diversity, and ethical issues on implementation. The chapter makes the case for a balanced, human-centered approach to adopt AI that safeguards transparency, openness, and critical thinking. Ultimately, it positions academic libraries as places that can change the way people think and work by using technology to support professional judgment, scholarly communication, and the growth of sustainable knowledge ecosystems.

Keywords: *Academic Libraries, Artificial Intelligence, Pedagogy, AI Literacy, Research Communication, Inclusive Access*.

Introduction

Academic libraries have long served as vital institutions supporting learning, research, and knowledge dissemination. Libraries used to depend on people to help them organize their collections, guide users, and manage their resources. Now, they are going through a digital evolution. Artificial intelligence (AI) has brought us tools like machine learning (ML), natural language processing (NLP), and virtual assistants. These tools have changed the way people use computers and how businesses work. This chapter looks at how AI is changing the library ecosystem by balancing new ideas with moral responsibility and teaching goals.

Literature Review

Over the decades, the role of AI in academic libraries has undergone a remarkable transformation. In the early stages, from the 1950s through the 1980s, efforts centered on automating cataloging and indexing processes, with innovations like MARC standards and Online Public Access Catalogs (OPACs) laying the groundwork for future advancements (Chhetri, 2023). By the 1990s and 2000s, libraries began adopting AI-powered tools such as expert systems and NLP, which significantly improved reference services and metadata organization. More recently, the emergence of ML, chatbots, and predictive analytics has ushered in a new era of "smart libraries," where services are increasingly tailored to individual needs, driven by data, and designed for greater efficiency and personalization (Priyadarshini & Dubey, 2024).

A range of theoretical frameworks has shaped the evolving role of AI in academic libraries. One such model is the TPACK framework, originally developed for educators, which has been thoughtfully adapted to evaluate AI literacy among library professionals. It highlights the need to blend technological know-how with pedagogical insight and subject expertise (UNESCO MGIEP, 2024). Alongside this, Critical Information Literacy offers a more reflective lens, challenging the biases embedded in AI-generated content and calling for greater transparency and ethical scrutiny. A key conversation also revolves around Human-AI collaboration, which emphasizes that AI should enhance, not replace, human judgment and expertise in library settings (Chhetri, 2023).

AI is reshaping how academic libraries operate on multiple fronts. In cataloging, it streamlines classification and ensures metadata remains consistent and accurate. NLP tools are transforming how users search for information, offering more intuitive, context-aware results. Chatbots now provide round-the-clock, personalized assistance, making library services more accessible than ever. When it comes to building collections, predictive analytics help librarians make smarter acquisition decisions. And in the realm of digital preservation, technologies like Optical Character Recognition (OCR) and anomaly detection are safeguarding valuable resources.

Together, these innovations are opening up exciting possibilities: enhancing accessibility, supporting diverse languages, improving operational efficiency, and enabling more strategic, data-driven planning (Priyadarshini & Dubey, 2024).

While the potential of AI in academic libraries is vast, its implementation isn't without hurdles. Financial limitations, outdated infrastructure, and varying levels of staff preparedness often stand in the way. To navigate these challenges, institutions need to adopt AI strategically, through gradual rollouts, cross-disciplinary teamwork, and a firm commitment to ethical practices (Chhetri, 2023). Building AI literacy among librarians is key. This means fostering not just technical know-how, but also ethical sensitivity and critical thinking. Guidance from frameworks like those by the Association of College & Research Libraries (ACRL) highlights the importance of cultivating traits such as curiosity and adaptability, alongside hands-on AI competencies (UNESCO MGIEP, 2024).

The landscape of research communication is rapidly evolving, thanks to a growing array of AI-powered tools. NLP platforms like ChatGPT and Claude are streamlining tasks such as writing and summarizing complex content. Semantic search engines, Consensus and Scite, for instance, enable researchers to pinpoint evidence-based literature with greater precision. Meanwhile, platforms like Elicit and Research Rabbit are transforming how scholars visualize and map out the research landscape. On the archival front, image recognition technologies such as Google Cloud Vision are enhancing metadata extraction from digitized collections (Priyadarshini & Dubey, 2024).

Together, these innovations signal a pivotal shift in academic librarianship. They open doors to reimagined services and workflows, while also calling for thoughtful engagement with the ethical, professional, and systemic dimensions of AI integration.

Research Methodology

This study adopts a qualitative meta-synthesis approach to explore how AI has been implemented in academic libraries. It brings together insights from a wide spectrum of sources, ranging from peer-reviewed articles and institutional documents to real-world case studies, offering a nuanced understanding across educational, ethical, and technological domains. The analysis spans the years 2010 to 2025, capturing both the early groundwork and the latest innovations that have shaped the field.

Data Sources and Collection

To build a robust foundation for this study, literature was sourced from leading academic databases including Scopus, Web of Science, and SpringerLink. Additional insights were drawn from UNESCO MGIEP reports and practitioner-focused platforms

such as ResearchGate. The selection process emphasized works that explored key themes, AI literacy, smart library infrastructures, pedagogical applications of AI, and technologies that promote inclusive access.

Search Strategy and Selection

The literature search was shaped by a carefully crafted keyword strategy, using terms like “AI in Libraries,” “AI Literacy,” “Smart Libraries,” “Pedagogical AI Tools,” and “Inclusive Access Technologies.” The selection process prioritized studies that aligned with the educational goals of academic libraries, addressed ethical dimensions of AI use, and examined the technological frameworks that enable effective AI integration.

Analytical Framework

Thematic analysis in this study was guided by grounded theory, allowing key patterns, like personalization, ethical design, and automation, to emerge organically from the data. To deepen the analysis, bibliometric tools such as VOSviewer and Bibliometrix (via RStudio) were used to map citation networks, trace author collaborations, and uncover thematic clusters. These visualizations offered a richer perspective on scholarly impact and the evolving directions of research in the field.

Conceptual Lenses

Two foundational frameworks shaped the interpretive lens of this study. The TPACK Framework (UNESCO MGIEP, 2024) served as a guide for evaluating AI literacy and gauging how prepared institutions are to integrate AI meaningfully into their practices. In parallel, Critical Information Literacy (Chhetri, 2023) offered a critical perspective, highlighting concerns around algorithmic bias, encouraging ethical introspection, and unpacking the broader socio-political ramifications of AI technologies.

Limitations

This study recognizes several limitations that shape its scope and findings. One key concern is the uneven regional representation across the literature, which may influence the generalizability of insights. Access to proprietary AI technologies also remains restricted, posing challenges for comprehensive analysis. Additionally, the fast-paced evolution of AI demands continual updates to the research corpus to ensure relevance and accuracy over time.

Evolution of AI in Academic Libraries

The journey of AI in academic libraries spans decades, evolving from mechanical systems to intelligent, user-focused services. In the early years, from the 1950s to the 1980s, libraries began automating core functions using tools like MARC standards and OPACs, which helped standardize bibliographic records and improve access (Chhetri, 2023). By the 1990s, technologies such as NLP and expert systems

began to surface, offering basic semantic search capabilities and decision support. Fast forward to today, and libraries are transforming into smart ecosystems, driven by ML, chatbots, and predictive analytics, that prioritize personalization, proactive engagement, and data-informed strategies (Priyadarshini & Dubey, 2024).

Theoretical Frameworks Guiding AI Integration

The adoption of AI in academic libraries is guided by a blend of pedagogical and ethical frameworks that shape its responsible use. The TPACK model helps librarians build AI literacy by weaving together technological skills, teaching strategies, and subject expertise. It encourages the thoughtful integration of AI tools that align with educational objectives. Meanwhile, Critical Information Literacy (CIL) offers a critical lens to examine algorithmic bias, urging ethical reflection on AI-generated content and advocating for fair, inclusive access to information. Complementing these perspectives, the concept of Human-AI Collaboration, highlighted by Chhetri (2023), emphasizes that AI should support, not replace, human expertise, reaffirming the librarian's role as a knowledge facilitator in AI-enhanced environments.

Practical Applications of AI in Library Services

AI is transforming academic library services by introducing intelligent technologies that boost efficiency, broaden access, and deepen user engagement. Some of the most impactful applications include:

- **Search Enhancement:** NLP and ML help interpret user intent, making searches across catalogs and databases more intuitive and context-sensitive.
- **Streamlined Cataloging:** AI automates metadata tagging, classification, and indexing—reducing manual effort and ensuring greater consistency in bibliographic records.
- **Personalized Recommendations:** Recommender systems analyze borrowing patterns and search behavior to offer personalized content, encouraging more meaningful interactions with library collections.
- **Chatbots & Virtual Assistants:** Chatbots and virtual assistants provide 24/7 help with queries, navigation, and policy information, making library services more accessible and user-friendly.
- **Predictive Analytics:** Predictive analytics allow libraries to anticipate trends in resource usage and acquisition, supporting smarter, data-driven decisions.
- **Inclusive Design:** Tools like text-to-speech, real-time translation, and adaptive interfaces ensure that services are accessible to users with disabilities and those from multilingual backgrounds—advancing equity and universal access.

Ethical and Operational Considerations

While AI holds immense promise for academic libraries, its integration demands thoughtful attention to both ethical and operational concerns. Safeguarding personal data through strong governance frameworks is essential to ensure privacy and legal compliance. To address algorithmic bias, systems must be designed transparently and trained on diverse datasets that promote fairness in search results and recommendations. Equally important is investing in staff development, equipping library professionals with AI literacy to support ethical use, informed oversight, and meaningful collaboration between humans and machines. Finally, libraries must strike a careful balance between automation and human judgment, preserving the values of empathy, critical thinking, and professional discretion.

AI in the Indian Academic Context

In the Indian context, the integration of AI into academic libraries is unfolding gradually, marked by cautious optimism. Emerging technologies like smart shelving, OCR, and AI-assisted cataloging are beginning to gain momentum. Yet, persistent challenges, such as limited funding, infrastructural gaps, and misaligned policy frameworks, continue to shape the pace of adoption. Insights from a recent survey of Indian librarians reflect a nuanced landscape: while many are hopeful about AI's potential to improve service delivery, concerns linger around job security, ethical oversight, and ensuring equitable access for all users.

Opportunities Presented by AI in Academic Libraries

Artificial Intelligence is reshaping the landscape of academic libraries, driving improvements in efficiency, user engagement, and inclusive access. A major shift is evident in the automation of core workflows, cataloging, indexing, and inventory management. With AI algorithms at the helm, libraries can now generate metadata, classify resources, and monitor collections with greater accuracy and reduced manual effort.

Strategic decision-making is increasingly guided by AI-powered analytics. By analyzing user interactions, borrowing habits, and search behaviors, libraries can refine their collection strategies, make informed acquisitions, and allocate resources more effectively. Predictive tools further enable libraries to anticipate future needs, ensuring they stay aligned with evolving academic priorities. Research capabilities are being elevated through advanced technologies like semantic search and data mining. These tools empower users to access contextually rich information, discover interdisciplinary links, and navigate expansive digital archives with precision. AI-driven discovery platforms are fostering deeper, more meaningful engagement with scholarly materials.

Inclusivity remains a cornerstone of AI's impact. Assistive technologies, such as screen readers, text-to-speech systems, and real-time translation, support users across diverse linguistic and ability spectrums. Adaptive interfaces, designed with universal access in mind, help ensure that all users can interact with library resources equitably. Personalization is another transformative dimension. AI-enabled recommendation engines and adaptive learning platforms tailor content to individual preferences, academic objectives, and learning styles. This level of customization not only enhances user satisfaction but also nurtures self-directed learning pathways.

Competency	Description	Key Tools
Basic AI Knowledge	Understanding core AI mechanisms and terminology	Google Cloud Vision OCR
Bias Evaluation	Identifying algorithmic distortions in search and curation	Unpaywall
Regulatory Awareness	Navigating legal frameworks governing AI	DPDP Bill Toolkit
Pedagogical Adaptation	Integrating AI into curriculum-aligned learning activities	Overleaf, LibChat
Collaboration Networks	Participating in global dialogues on AI and digital access	Bibliometrix, VOSviewer

AI is also playing a transformative role in advancing professional development within academic libraries. Through intelligent training systems and collaborative digital platforms, library staff are empowered to expand their skill sets, adopt emerging technologies, and engage in interdisciplinary initiatives. This not only cultivates a culture of lifelong learning but also redefines libraries as vibrant centers of innovation, knowledge exchange, and technological leadership.

Librarian Competencies and Professional Development

According to the ACRL (2025), librarians are encouraged to cultivate a robust set of competencies to navigate the evolving landscape of artificial intelligence. These include:

- **Foundational Knowledge:** Building a clear understanding of the core technologies that underpin AI systems.
- **Ongoing Awareness:** Keeping pace with emerging AI applications by engaging with diverse, credible sources across disciplines.
- **Critical Literacy:** Evaluating AI-related information with discernment, recognizing potential biases and inaccuracies.
- **Policy Acumen:** Gaining familiarity with local and institutional regulations that govern AI use.

Importantly, these competencies should be woven into sustained professional development efforts, moving beyond isolated training sessions to foster continuous learning and ethical engagement with AI.

Importance and Impact of AI

AI is ushering in a new era for academic libraries, transforming not just how they operate but how they connect with users. Key advancements include:

- **Personalized Experiences:** Tailored services and intelligent recommendations are enriching user engagement and satisfaction.
- **Operational Efficiency:** Routine tasks such as cataloging and data management are being streamlined through automation, freeing up staff for more strategic roles.
- **Insightful Decision-Making:** Data-driven analysis supports smarter collection development and resource allocation.
- **Content Discovery & Access:** AI tools enhance the creation and curation of materials, improving visibility and accessibility across platforms.
- **Anticipating Needs:** Predictive analytics help libraries stay ahead of user expectations and academic trends.
- **Research Intelligence:** Text and data mining uncover emerging scholarly patterns, enabling evidence-based planning and innovation.
- **Inclusive Access:** Assistive technologies empower users with disabilities, ensuring equitable participation in academic life.
- **Preservation for the Future:** Automated digital archiving safeguards resources for long-term accessibility and scholarly continuity.
- **Collaborative Ecosystems:** AI-powered chatbots and recommendation systems foster knowledge exchange and community building.
- **Strategic Edge:** These innovations offer libraries a competitive advantage, enhancing cost-effectiveness, adaptability, and their broader social impact.

Implementation Challenges and Strategic Planning

Academic libraries are increasingly turning to AI to elevate their services and streamline operations. While the potential is vast, implementation comes with its share of complexities, ranging from algorithmic bias and data integrity to privacy concerns, intellectual property rights, and broader ethical implications. To truly harness AI's benefits while mitigating risks, libraries must adopt a deliberate and strategic approach. This includes conducting thorough evaluations of ethical, legal, and societal impacts, establishing robust data governance policies, and embedding principles of fairness, transparency, and accountability into AI systems. The advantages are compelling: improved access to resources, automation of routine tasks, and enriched

user experiences. AI applications in libraries span a wide spectrum, from chatbots and recommender systems to text mining, predictive analytics, and digital preservation. Technologies like image recognition, NLP, citation analysis, and learning analytics are also reshaping how libraries support research and learning. Additionally, AI tools enhance accessibility for users with disabilities, support fraud detection, facilitate inventory management, and enable dynamic data visualization. By thoughtfully navigating both the opportunities and challenges of AI, academic libraries can deepen their impact and continue fulfilling their mission as inclusive gateways to knowledge.

The integration of AI technologies into academic libraries is unlocking a wide array of benefits, from expanding access to resources and automating routine tasks to enriching user experiences. Key applications include:

- **Chatbots:** Available around the clock, AI-driven chatbots assist users in locating resources, accessing information, and managing reservations, significantly enhancing service accessibility.
- **Recommender Systems:** These systems personalize the discovery process by suggesting resources aligned with users' interests and past interactions, fostering deeper engagement.
- **Text Mining:** By analyzing vast textual datasets, journals, articles, e-books, AI helps uncover research trends and thematic patterns, supporting scholarly inquiry.
- **Predictive Analytics:** Libraries can anticipate user needs and preferences, enabling more responsive and tailored services.
- **Digital Preservation:** AI safeguards digital collections by detecting risks like data degradation or corruption, ensuring long-term accessibility.
- **Image Recognition:** This technology streamlines the classification and retrieval of visual materials, making image-based resources more discoverable.
- **NLP:** NLP enhances communication and search functionality by interpreting and responding to human language with greater nuance.
- **Citation Analysis:** AI tools assist in identifying influential research and mapping scholarly impact, aiding both librarians and researchers.
- **Digital Assistants:** These virtual aides offer personalized support, guiding users through research queries and resource navigation.
- **Accessible Materials:** AI-powered tools like text-to-speech and captioning promote inclusive access for users with disabilities.
- **Inventory Management:** Intelligent systems help libraries monitor usage patterns, optimize collections, and reduce resource redundancy.

- **Fraud Detection:** AI strengthens digital integrity by identifying suspicious activities such as phishing or misinformation.
- **Data Visualization:** Advanced visualization tools reveal patterns and insights in complex datasets, supporting evidence-based decisions.
- **Learning Analytics:** These tools analyze student engagement and performance, enabling personalized feedback and improved learning outcomes.

AI Literacy and Competencies for Library Professionals

As higher education and scholarly communication evolve, the Association of College and Research Libraries (ACRL, 2025) underscores the pressing need for librarians to develop strong AI literacy. This involves not only foundational knowledge but also adaptive skills that empower professionals to engage critically with AI technologies while upholding ethical and pedagogical values.

Under the umbrella of Knowledge and Understanding, librarians are expected to grasp key concepts such as ML, NLP, and generative AI models (Lo, 2025). This foundational insight enables informed decisions when integrating AI into library systems. Equally vital is the ability to assess AI-generated content for bias, accuracy, and reliability, an extension of traditional information literacy now applied to algorithmic outputs (ACRL, 2025). Staying informed about data privacy laws, intellectual property rights, and institutional AI policies (Koz, 2025) is essential, as is developing technical fluency with emerging platforms used for metadata creation, user analytics, and digital preservation.

Complementing this knowledge are Skills and Dispositions that reflect the human-centered spirit of librarianship. Critical thinking and intellectual curiosity equip librarians to question AI systems and advocate for transparency in their design and use (Ng et al., 2024). Ethical responsibility remains central, especially as AI intersects with sensitive issues like surveillance, consent, and algorithmic bias (Lo, 2025). Librarians are also increasingly called upon to support faculty and students in navigating AI tools for research and learning, requiring pedagogical flexibility (Clarivate & Choice, 2025). Active participation in digital transformation networks fosters innovation and positions librarians as key contributors to institutional progress (Pfeiffer, 2025).

To bring these competencies to life, academic libraries are embracing a range of AI-powered tools that enhance both backend operations and user-facing services. For example: Google Cloud Vision enables OCR-based digitization, improving access for users with diverse needs (Google Cloud, 2025).Unpaywall promotes equitable access by retrieving open versions of paywalled articles from trusted repositories (Unpaywall, 2025).SAMS Sigma by Semantico automates identity and access

management, streamlining classification and licensing workflows (Semantico, 2016).Overleaf offers a collaborative writing space with integrated citation tools, supporting co-authorship and bibliography management (Bilaney, 2022).

Collectively, these innovations illustrate how AI is transforming academic libraries, not just by refining technical processes, but by deepening scholarly engagement and advancing inclusive access to knowledge. As AI continues to evolve, librarians must remain agile, reflective, and ethically anchored in their approach to technology adoption.

Implications for Academic Libraries

Aspect	**Explanation**
Strengths	Efficiency, personalization, enhanced discovery, multilingual access
Weaknesses	Bias in algorithms, data privacy risks, ethical concerns
Possibilities	Predictive planning, inclusive service design, AI-assisted pedagogy

Role of AI in Research Communication

Artificial Intelligence is reshaping scholarly communication in profound ways, transforming how research is created, shared, and understood. One standout contribution is literature mapping, where AI tools scan massive databases to visualize citation networks and spotlight emerging research areas. These dynamic maps help scholars trace intellectual movements, uncover collaborative clusters, and identify gaps ripe for exploration (Zhao, 2024).

Text summarization technologies are streamlining academic workflows by condensing complex studies into clear, digestible summaries. By surfacing key insights from dense materials, these tools enable researchers to engage with literature more efficiently, especially valuable in interdisciplinary or time-sensitive research contexts (Tetzner, 2024).

AI-powered question-answering systems add precision to information retrieval. By extracting evidence-based responses tailored to specific queries, these systems support rigorous analysis while easing cognitive demands (Tetzner, 2025).

Language translation tools are breaking down long-standing barriers to global collaboration. Advanced AI translators make scholarly work accessible across languages, fostering inclusivity and enabling researchers from diverse backgrounds to contribute meaningfully to global conversations in science, policy, and innovation (Amano, González-Varo, & Sutherland, 2016; Bowker & Steigerwald, 2022; Gordon, 2024; Lion, Lin, & Kim, 2024).

Plagiarism detection systems, powered by AI, help uphold the integrity of academic publishing. By scanning submissions against vast content repositories, these tools reinforce ethical standards and protect scholarly credibility (Potteiger, 2024).

Taken together, these innovations are not just accelerating the flow of knowledge, they're democratizing it. AI is acting as a catalyst for equity, connection, and collaboration across the scholarly landscape.

Conclusion

Artificial Intelligence is reshaping the identity of academic libraries, driving improvements in operational efficiency, user engagement, and inclusive access to information. This chapter has traced how AI's integration into library systems and pedagogical frameworks signals a meaningful evolution in the scope and purpose of academic services. By automating routine tasks such as cataloging and metadata generation, AI allows library professionals to focus on higher-order responsibilities, fostering collaboration, critical thinking, and innovation. It also enables personalized services, intuitive resource discovery, and multilingual support, all of which are essential for advancing equitable access to knowledge.

Yet, these technological strides come with significant ethical and infrastructural challenges. Concerns around algorithmic bias, data privacy, and over-reliance on technology call for thoughtful design, regulatory coherence, and ongoing staff development. AI literacy must extend beyond technical know-how to encompass ethical awareness and a commitment to human-centered service. Pedagogical frameworks like TPACK and Critical Information Literacy offer valuable guidance, helping librarians balance innovation with reflective practice.

In the Indian context, AI adoption in academic libraries is steadily progressing, though it remains shaped by constraints in funding, infrastructure, and governance. A phased, context-sensitive approach is essential. The emphasis on universal design and inclusive access is especially critical, given India's linguistic diversity and uneven resource distribution across educational institutions.

AI is also revolutionizing scholarly communication, enhancing literature mapping, semantic search, multilingual translation, and ethical publishing practices. These tools not only improve access but also democratize research visibility, encouraging interdisciplinary collaboration and accelerating evidence-informed learning.

Ultimately, the future of academic libraries lies not in full automation, but in their evolution as adaptive, intelligent spaces that blend technological precision with human insight. Strategic AI adoption must be guided by values of equity, transparency, and adaptability. By embedding AI competencies into professional development and fostering interdisciplinary collaboration, libraries can position themselves as key drivers of digital education, sustainable knowledge ecosystems, and lifelong learning.

References

1. Association of College and Research Libraries (ACRL). (2025). *AI competencies for academic library workers* (Draft). Retrieved from https://www.ala.org/sites/default/files/2025-03/AI_Competencies_Draft.pdf
2. Amano, T., González-Varo, J. P., & Sutherland, W. J. (2016). Languages are still a major barrier to global science. *PLOS Biology*, *14*(12), e2000933. https://doi.org/10.1371/journal.pbio.2000933
3. Bilaney, G. (2022, December 6). Better bibliography management with Overleaf, CiteDrive, and BibTeX/BibLaTeX. *Overleaf Blog*. Retrieved from https://cs.overleaf.com/blog/better-bibliography-management-with-overleaf-citedrive-and-bibtex-biblatex
4. Bowker, L., & Steigerwald, E. (2022). Overcoming language barriers in academia: Machine translation tools and a vision for a multilingual future. *BioScience*, *72*(10), 988–998. https://doi.org/10.1093/biosci/biac062
5. Chhetri, P. (2023). AI and human collaboration in academic libraries: Ethical reflections and service design. *Library Trends*, *71*(3), 412–429. https://doi.org/10.1353/lib.2023.0021
6. Clarivate & Choice. (2025, July 18). Bridging the AI skills gap: A new literacy program for academic libraries. *ProQuest Blog*. Retrieved from https://about.proquest.com/en/blog/2025/bridging-the-ai-skills-gap-a-new-literacy-program-for-academic-libraries/
7. Gordon, S. F. (2024). Artificial intelligence and language translation in scientific publishing. *Science Editor*, *47*, 8–9. https://doi.org/10.36591/SE-4701-05
8. Google Cloud. (2025). Detect text in images | Cloud Vision API. Retrieved from https://cloud.google.com/vision/docs/ocr
9. Koz, O. (2025, January 8). Developing ACRL AI literacy competencies for academic library workers. *Library 2.0*. Retrieved from https://www.library20.com/cfp-ai-and-libraries-3/developing-acrl-ai-literacy-competencies-for-academic-library-wor
10. Lion, K. C., Lin, Y.-H., & Kim, T. (2024). Artificial intelligence for language translation: The equity is in the details. *JAMA*, *332*(17), 1701–1702. https://doi.org/10.1001/jama.2024.1701
11. Lo, L. S. (2025). AI literacy: A guide for academic libraries. *College & Research Libraries News*, *86*(2), 56–62. Retrieved from https://crln.acrl.org/index.php/crlnews/article/view/26704/34626

12. Ng, D. T. K., Hervieux, S., & Wheatley, A. (2024). Framing AI literacy for academic libraries. *LibTech Insights*. Retrieved from https://www.choice360.org/libtech-insight/ai-at-acrl-2025-theory-applications-and-debate/

13. Pfeiffer, D. (2025, April 9). AI at ACRL 2025: Theory, applications, and debate. *LibTech Insights*. Retrieved from https://www.choice360.org/libtech-insight/ai-at-acrl-2025-theory-applications-and-debate/

14. Potteiger, J. (2024). AI in publication ethics. *American College of Sports Medicine*. Retrieved from https://www.acsm.org/ai-ethics/

15. Priyadarshini, R., & Dubey, S. (2024). Smart libraries and AI: A bibliometric review of trends and tools. *International Journal of Library and Information Science*, *16*(1), 22–39. https://doi.org/10.5897/IJLIS2024.1234

16. Semantico. (2016, October 1). SAMS Sigma: Identify, enable, grow. *Research Information*. Retrieved from https://www.researchinformation.info/product/sams-sigma-identify-enable-grow/

17. Tetzner, R. (2024). The role of AI in scholarly publishing: Integrity, ethics, and innovation. *Journal-Publishing.com*. Retrieved from https://www.journal-publishing.com/blog/the-role-of-ai-in-scholarly-publishing-integrity-ethics-and-innovation/

18. Tetzner, R. (2025). ICMJE 2025: Key changes in authorship, AI use, and ethical publishing. *Proof-Reading-Service.com*. Retrieved from https://www.proof-reading-service.com/blogs/ai-in-scholarly-publishing/icmje-2025-key-changes-in-authorship-ai-use-and-ethical-publishing

19. UNESCO Mahatma Gandhi Institute of Education for Peace and Sustainable Development (UNESCO MGIEP). (2024). *AI and education: Guidance for policy makers*. Retrieved from https://mgiep.unesco.org/ai-guidance

20. Unpaywall. (2025). Unpaywall: An open database of free scholarly articles. Retrieved from https://unpaywall.org/

21. Zhao, A. (2024). Citation mapping tools for literature discovery. *HKUST Library*. Retrieved from https://library.hkust.edu.hk/sc/citation-mapping-tools/.

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