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AI LITERACY IN ACADEMIC LIBRARIANSHIP: COMPREHENSIVE LITERATURE REVIEW AND EMERGING TRENDS

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Abstract:

The rapid integration of artificial intelligence (AI) into academic libraries has created both opportunities and challenges for librarians, particularly in terms of AI literacy. Despite the transformative potential of AI to enhance library services, many academic librarians lack the necessary competencies to effectively adopt and leverage these technologies. This gap in AI literacy poses significant barriers to equitable access and responsible AI use, threatening the ability of libraries to remain relevant in an increasingly digital and AI-driven world. To address this issue, this study aims to comprehensively review existing research on AI literacy in academic librarianship, identify best practices for enhancing AI literacy among librarians and the key themes for AI Literacy for academic librarian. The study using systematic analysis of recent literature from Scopus. Findings indicate that successful AI literacy initiatives often involve structured reskilling programs, interdisciplinary collaboration, and the integration of ethical frameworks into training curricula. These findings contribute to both theory and practice, offering a foundation for empowering academic librarians to navigate the complexities of AI adoption while promoting equity and ethical responsibility in library services.

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Keywords:

Academic Librarians, Academic Libraries, Artificial Intelligence, Artificial Intelligence Literacy, AI Literacy, Librarianship

Introduction

The growth of Artificial Intelligence (AI) in technologies has completely changed a lot of sectors. AI has becoming significant for the optimization of the efficiency of the library processes, and also the facilitation of the library services (Marinclin et al., 2024; Molaudzi & Ngulube, 2025). Within the context of this broader environment, the idea of artificial intelligence literacy among academic librarians has emerged as a critical area of concern.

The impact of AI is significantly transforming library services, ranging from minor enhancements to fundamental changes. Libraries are expected to adopt AI in areas that align with existing roles, meet user needs, or require minimal resources. Some of the impact AI applications help librarians create the initial metadata for items, librarians can assist data scientists with data discovery, copyright and preservation also the use of AI-driven chat bot enhances library user service. developing digital and information literacy.

Importantly, the rise of generative AI highlights the need for AI literacy among library staff and users. Libraries are well-positioned to promote this, building on their role in developing digital and information literacy. AI literacy involves understanding, critically evaluating, and effectively collaborating with AI technologies (Cox, 2023).

A recent study about librarian attitudes toward AI shows that 86% of librarian work in academic are little familiar with AI. Meanwhile only 10% from data shows that librarians are very familiar with and used to AI. Only 4% of them are not familiar with AI. Librarians' attitudes towards AI are generally positive but they need enhance their skills in using AI tools (Elsevier, 2024). Due to lack of hands-on experience in utilizing AI, librarians can be considered moderately to lowly AI literate (Elsevier, 2024; Alam et al., 2024; Lo, 2024).

Therefore, this study attempts to gives a complete overview of AI literacy in academic librarianship by gathering the insight and findings from multiple previous research works. This literature review seeks to fill these gaps by offering a comprehensive summary of the current state of AI literacy in academic librarianship. Objectives of the paper are as follow:
(a) To review existing research on AI literacy in academic librarianship.
(b) To review best practices and strategies for enhancing AI literacy among librarians.
(c) To examine AI Literacy for academic librarian by examining its connections to key themes

Literature Review

AI literacy encompasses not only technical proficiency but also an understanding of ethical considerations, critical thinking, and adaptability in the face of evolving technologies (Lo, 2024; Cai et al., 2024). Developing AI literacy is crucial for academic librarians, who act as gatekeepers of knowledge and research facilitators, thereby ensuring that libraries are still relevant and efficient in a world where the most-dominated driving force is artificial intelligence.

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While artificial intelligence is gaining ground in significance for academic libraries, there are still a lot of obstacles that stand in the way of it being widely accepted. The lack of funds, insufficient infrastructure, and the absence of support from the organization are cited by some academic libraries as reasons for their failure to adopt AI. Besides this, quite a few academic librarians have no skills and expertise for the implementation of AI technology in their normal work (Chatikobo & Pasipamire, 2024).

Mupaikwa (2025) firmly emphasizes the involvement of AI technologies such as a machine, NLP, and robots in both the improvement of information literacy as well as the provision of personalized services. Lo (2024) and Cai et al. (2024) make a stressing note of the necessity for reskilling and continuous learning programs to fill the AI literacy gap among librarians. However, the level of understanding of artificial intelligence among academic librarians remains a puzzle, despite this effort.

Although the present studies give us a deep analysis of the application or areas, there is still a gap that exists in the synthesizing of the bigger picture of the opportunities and challenges that come with the issue of AI literacy in the academic library field. Past studies are inconsistent in results, and they have raised the ethical issues of the acceptance of artificial intelligence, the success of the present reskilling programs, and the long-term viability of AI integration projects as unanswered. In addition, limited attention has been given to the part played by interdisciplinary cooperation and strategic planning in the promotion of AI literacy among librarians (Cai et al., 2024).

Prior study showed that researcher have contribute to the development of construct for a framework and scale in assessing the AI literacy. The development of these scales and frameworks provides valuable insight and can be adopted in future research of AI literacy. The following table below present the mains construct and dimensions used for AI literacy.

Table 1: List of Theoretical Frameworks

Theoretical Framework	Core Construct	Authors
Systematic literature synthesis	Recognize, Know, Use, Evaluate, Create, Navigate ethically	Almatrafi et al. (2024)
AI Literacy Framework	Cognitive,Metacognitive, Affective, Social	Kong et al. (2024)
KAT Framework	Knowledge, Attitudes, Thinking based on Bloom's and developmental theory	Zhong & Liu (2025)
Meta AI Literacy Scale	Use, Understand, Create, Detect, Ethics, Self-efficacy/management	Carolus et al. (2023)
Psychometric Framework	Communication, creativity, evaluation, collaboration + predictors	Ning et al. (2025)

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In conclusion, the foundational groundwork for AI literacy has been laid, but more unified and strategic action is needed if academic librarians are to be fully prepared for an AI-driven future.

Methodology

The study adopts a systematic literature review method to explore AI literacy of librarians, especially in higher education institution utilising Scopus as the primary data source. The study employed the Scopus AI for data collection, using a combination of natural language and keyword-based searches to achieve the research objectives. Scopus AI unique features include article authored by subject matters, namely the most productive authors in the discipline (HKUST Library, 2024). Scopus AI also offer the cited relevant work in the discipline. Scopus AI's text-mining features not only improve the effectiveness and precision of the literature review but also guarantee that the results are based on reliable, good quality evidence. Scopus AI is a significant tool for researchers in conducting comprehensive literature review, outlining the research problems, defining the research gap and helps researcher to identify influential authors (Aguilera-Cora et al, 2024; ALLEA, 2023).

The natural language query, “What is the current state of artificial intelligence literacy in academic librarianship and what are the future directions for research in this area?”, was employed to collect a broad range of literature. The search was supplemented by using Boolean operator with a keyword search using terms: ("artificial intelligence" OR "ai" OR "machine learning" OR "deep learning") AND ("literacy" OR "competency" OR "proficiency" OR "skills") AND ("academic" OR "higher education" OR "university" OR "college") AND ("librarianship" OR "library science" OR "information science" OR "library management") AND ("training" OR "education" OR "development" OR "workshop"). In conducting the comprehensive review, inclusion criteria were applied to ensure the relevance and currency of findings. This study focused on the literature that published and indexed in Scopus which only include peer-reviewed articles, books chapters, conference papers, and reviews. Studies that specifically addressed the intersection of artificial intelligence literacy and academic library, with a focus on skills and competencies, academic librarian and training, were prioritized. The abstracts, methodologies, and key findings of the articles were reviewed to determine their relevance. Sources that are not related within the field of library and information management were omitted. Non-peer-reviewed sources were also excluded from this review.

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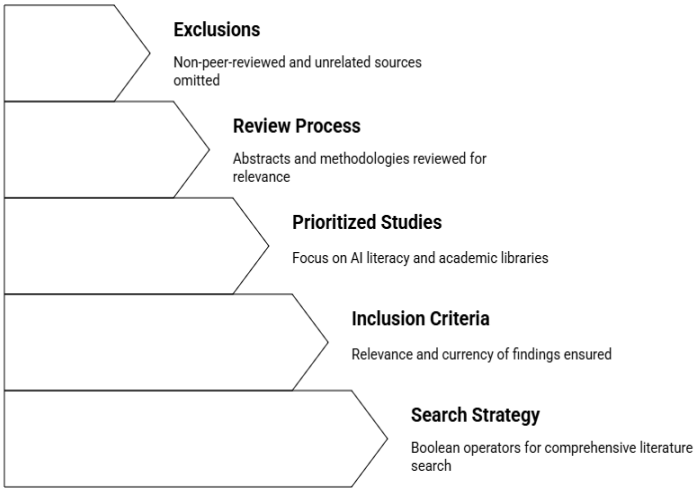

Figure 1 : Flow Diagram of The Searching and Selecting Literature

Result and Discussion

This section presents the review from prior literatures by utilizing Scopus AI. The outline of the findings is accordance with the research objectives and discusses their consequences. The discussion describes these findings within the literature, highlighting major themes, rising trends, ongoing issues, and effective solutions. This research explores the influence of AI literacy on the changing roles of academic librarians.

AI Literacy in Academic Librarianship

The current new works on AI literacy in academic librarianship reveal a growing number of examples. They demonstrate the great power of AI technologies for the library operation. Such ventures exemplify the potential of artificial intelligence to raise productivity and to make user experiences more personalized, thus fulfilling user demands more effectively. However, many academic libraries still tend to be in the initial stage of AI adoption, even in those areas where there is insufficient technological infrastructure and lack of institutional support (Marinclin et al., 2024; Molaudzi & Ngulube, 2025). This gap indicates the necessity of a profound understanding of how librarians can become AI-literate to enable everyone to gain access to these changes.

Academic librarians, who are considered to be custodians of knowledge and research supporters, are in need of a profound comprehension of artificial intelligence if they are going to be able to deal with its complexity. Studies show that AI literacy focuses on fostering mindsets of continuous learning and multidisciplinary cooperation as much as recognizing various tools (Cai et al., 2024). This broader concept of AI literacy puts more emphasis on the need for ethical rules and reflective behaviors to be included in the learning process since the librarians are the ones who should be ready to handle the consequences of AI acceptance.

Although artificial intelligence literacy is considered a crucial skill and its importance is growing exponentially, the research on this area is still very limited. A lot of investigations indicate that the influence of librarians' AI literacy is not defined and developed by consistent frameworks (Chatikibo & Pasipamire, 2024; Mupaikwa, 2025).

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Existence literature also continuously describes the ways institutional support and reskilling initiatives contribute to the transformation of librarians into AI-literate ones. Data suggests that many academic librarians are not provided with enough instruction to incorporate AI tools into their daily work, thus hindering the more general use of the technology (Marinclin et al., 2024; Molaudzi & Ngulube, 2025). The programs that highlight ethical issues, their practicality, and lifelong learning have opened doors for the elimination of this gap (Lo, 2024; Cai et al., 2024). Institutional support, however, is still the main factor in these programs' success and therefore, it is of utmost importance that strategic planning and financial input be provided for the librarians to continue their journey into AI literacy.

Finally, the examination of the existing literature points out the necessity of the parallel implementation of AI literacy initiatives and more general educational and occupational schemes. Pointing out the need of the utilization of integrated strategies for curriculum development, the study explores the relationship of AI literacy with the already available information and media literacy concepts (Cai et al., 2024; Mupaikwa, 2025; Salhab, 2024). By incorporating the AI literacy into the library science courses, educational institutions can prepare future librarians to flourish in an AI-driven environment. The findings generally illustrate the potentials as well as the problems associated with AI literacy in the academic librarianship field and thus guide the next studies and activities in this new domain.

Best Practices and Strategies for Enhancing AI Literacy Among Librarians

Recent studies emphasize the significance of the establishment of a culture that is adaptable to the changes, open to new experiences and exploration, whereby librarians are empowered to engage with AI technology through practical experiences and collaborative initiatives (Lo, 2024; Cai et al., 2024). In order to increase AI literacy, the combination of the hands-on training with reflective conversations enables those who participate in the GPT-4 Exploration Program at the University of New Mexico to build the confidence that they can manage the use of AI tools (Lo, 2024). These projects particularly illustrate the prominence of experiential learning as a foundation for good AI literacy development in academic library settings.

Librarians need to equip themselves not only in technical skills only, but *also must aware of the ethical issues triggered by artificial intelligence* implementation such as data privacy, algorithmic bias, and the impact on human jobs (Cai et al., 2024; Marinclin et al., 2024). Courses introduce must include ethical frameworks to ensure that librarians might conduct critical evaluation of AI tools and request the fair and responsible use of them in their institutions (Cai et al., 2024). The combination of this emphasis on technical as well as ethical literacy reflects the numerous nature of AI literacy and its role in guiding ethical innovation in the library field.

Cross-disciplinary is another approach to improve librarian AI literacy. The publications underscore the potential of joint efforts in cross-disciplinary knowledge systems and the practice of capabilities via collaborations among academic libraries, faculty staff, and technological experts (Cai et al., 2024; Mupaikwa, 2025). To give an example, academic libraries are partnering with computer science departments more and more to offer classes and workshops involving AI literacy into library science curricula (Cai et al., 2024; Mansoor et al, 2024). Not only do such partnerships improve librarians' technical abilities, but they also enable them to be more active in implementing the services of the general institutional projects of faculty and student's AI literacy improvement.

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Finally, it is pointed out in the study that the inclusion of AI literacy education in strategic thinking for the long term is a necessity for university libraries. Commitment from institutions, clearness of objectives, and regular evaluation of effectiveness are argued by researchers as important aspects of sustainable AI reskilling programs (Molaudzi & Ngulube, 2025; Lo, 2024). Libraries can create such warm environments that encourage lifelong learning and adapt to new artificial intelligence technology by aligning AI literacy actions with general institutional objectives. The findings unveil a large scope of effective practices and ways to improve librarians' AI literacy, thus opening insightful information for policymakers, library managers, and teachers who shape academic librarians' empowerment in the AI-driven world.

Key Themes of AI Literacy for Academic Librarian

The concept map below in the figure illustrates the various dimensions of AI Literacy and its implications for educational work, research, and ethical AI implementation for academic librarianship. The study's focus has moved from AI Literacy to two major subjects: updating AI guide and setting AI policy as well as curriculum implementation in the library science field.

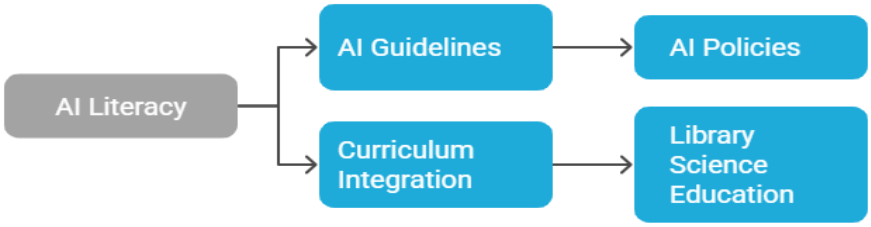

Figure 2: Concept Map of AI literacy for Academic Librarianship

AI Literacy, Guidelines, Policies: A Comprehensive Analysis

The integration of AI literacy into professional practices and school systems is now being viewed more and more as a basis for navigating the complexity of artificial intelligence (AI) adoption. AI literacy frameworks equip individuals with the required competences for understanding, analyzing, and engaging responsibly with AI devices. These frameworks generally go for the representation of multidimensional thinking capacities, namely the knowledge of AI concepts, critical evaluation skills, ethics, and teamwork (Allen & Kendeou, 2023; Kong et al., 2024). An example of this would be that by outlining such frameworks, the organizational principles of AI literacy can be transformed into functional plans compatible with the overall context of AI policy. For instance, standards stressing the legitimate application of AI and the situational adjustment also serve to ensure that the professionals, librarians, and policymakers, who apply AI tools, are not only in line with the needs of society but also with the specific institutional purposes of their sectors.

Guidelines are official directives that translate the theoretical underpinnings of AI literacy into practical applications, bringing consistency and accountability to AI uptake in different settings (Chee et al., 2024; Funa & Gabay, 2025). Guidelines typically address matters such as technical integration issues, ethical concerns, and the need for extensive training programs. As an example, the principles for university libraries outline that AI literacy among librarians can be achieved by professional training and adaptation to the ethical rules (Lo, 2024). Not only are these standards the basis of the institutional policy, but also the means for the resolution of systemic problems (such as poor infrastructure or lack of expertise) causing the hindrance of the further applications of AI technologies.

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The combination of guidelines and AI policies with AI literacy creates a solid foundation for developing responsible and inclusive adoption of AI. Institutional or national education policies often resort to pre-established AI literacy frameworks and guidelines to guarantee that AI integration is both technologically robust and socially accountable (Isotani et al., 2023; Lo, 2023). Thus, initiatives such as mandating AI ethics in K-12 schools or workforce development programs, actually mirror the core of AI literacy frameworks so that students develop the necessary capabilities and ways of thinking to thrive in an AI world (Casal-Otero et al., 2023; Hossain, 2022).

The legislation also facilitates in encouraging lifelong learning paths, adapting AI literacy programs for various learner populations and fields (Chee et al., 2024; Zhang et al., 2024). If this systematic approach is taken, then it is certain that AI policies will be flexible enough to account for new technological advances and societal demands.

Professional development programs and evaluation tools remain essential in establishing the relationship between AI literacy, guidelines, and policies. Evaluation tools for AI literacy, such as questionnaires or competency tests, allow schools to track the impact of their projects and adjust their policies accordingly (Lo, 2024; Zhang et al., 2024). These instruments are crucial for detecting voids in understanding or professional capacity, so that decision-makers can update guidelines and make changes to resource allocation accordingly. Besides, the professional development programs which are associated with AI literacy also give educators and librarians a chance to be able to handle the new opportunities and challenges which will come with the implementation of AI.

Table 1: List of Literature on AI Literacy, AI Guidelines, and AI Policies

Authors	Title	Source title	Cited by
Isotani et al. (2023)	Artificial Intelligence and Educational Policy: Bridging Research and Practice	Communications in Computer and Information Science	2
Allen & Kendeou (2023)	ED-AI Lit: An Interdisciplinary Framework for AI Literacy in Education	Policy Insights from the Behavioral and Brain Sciences	9
Lo L.S. (2023)	An Initial Interpretation of the U.S. Department of Education's AI report: Implications and Recommendations for Academic Libraries	Journal of Academic Librarianship	10
Lo L.S. (2024)	Evaluating AI Literacy in Academic Libraries: A Survey Study with a Focus on U.S. Employees	College and Research Libraries	5
Chee et al. (2024)	A Competency Framework for AI Literacy: Variations by		0

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	Different Learner Groups and an Implied Learning Pathway	British Journal of Educational Technology	
Zhang et al. (2024)	Artificial Intelligence Literacy Education: Global Progress and Prospects	Documentation, Information and Knowledge	1
Kong S et al. (2024)	Developing an Artificial Intelligence Literacy Framework: Evaluation of a Literacy Course for Senior Secondary Students using a Project-Based Learning Approach	Computers and Education: Artificial Intelligence	18
Funa & Gabay (2025)	Policy Guidelines and Recommendations on AI Use in Teaching and Learning: A Meta-synthesis study	Social Sciences and Humanities Open	0

Curriculum Integration in Library Science Education

Incorporating AI literacy in library science education becomes significantly crucial when libraries are changing their nature to become AI-driven entities (Daly et al., 2024). AI literacy includes only technical skills but also the capability of critical evaluation and ethical use if one applies AI technology in work (Olari et al., 2023; Merceron & Best, 2024). For the librarians of the future, AI literacy tasks them with handling the complexities that modern library services bring such as automated cataloging, personalized recommendations for users, and data-driven decision-making. The literature puts it that a great demand arises today to equip library science students with AI and data literacy education, focusing especially on librarians' roles of information facilitation and literacy provision in an AI-empowered future (Merceron & Best, 2024). Thus, schools get students ready to harness AI tools with maximum efficiency while anticipating ethical and societal issues through AI literacy incorporation in library science programs.

Even though the importance of AI literacy has been realized and widely spread, there are still huge difficulties in obtaining it completely and realizing it in library science education. It is noted in the literature that the lack of technological infrastructure, lack of support at the organizational level, and use of outdated content in libraries may limit the capacity of library science programs in conducting AI-based curricula (Chatikobo & Pasipamire, 2024). Moreover, faculty members in library science programs are not adequately trained for AI, and this situation leads to a lack of professional development (Olari et al., 2023). Hence, local authorities and universities must put a special focus on faculty development and course change so that educators can be given enough power, skills, and resources to teach and incorporate AI literacy into their teaching. Models brought up by Ndungu (2024) shed light on the great opportunity of incorporating AI literacy in present media and information literacy (MIL) activities, thus pointing out that library science education can re-shape itself along with the emerging trends in a realistic way.

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The perspective of library science students indicates the usefulness of AI literacy to professional practice. A survey with students for the Master's Degree in Library Science from India reveals the positive propensities of AI to the turning of library services, that relates to the awareness of AI literacy the being necessary to improve career readiness (A et al., 2024). The result of the research is that students have accepted the revolutionary appearance of AI on library services, and they are willing to get the proper skills for the implementation of AI tools in their job. The research also highlights the absence of the lack of AI literacy which is conducted in a systematic manner in library schools, leading to the need for specialized curriculum development. By infusing AI literacy in the curriculum of training library science, institutions are confident that graduates have the skills to deal with the opportunities and threats caused by the AI presence in libraries.

To commercial switching into an AI-literate library science education, literature recommends the use of the strategies of continuous professional development and cross-disciplinary collaboration (Merceron & Best, 2024). Professional development workshops can help teachers to get the necessary knowledge and abilities for the creation and implementation of the AI literacy curriculum, and advocacy can help to spread the awareness of the necessity of AI literacy in the training of future librarians for the future of AI. Furthermore, while deciding on the design of AI literacy programs, institutions need to consider the ethical questions so that students not only learn about the societal implications of AI technologies but are also ready to react to problems of bias, privacy, and accountability (Ndungu, 2024). By encouraging a culture of continuous learning and ethical responsibility, library science programs can help students to keep abreast of changes in academic librarianship and to be resourceful contributors.

In brief, the relationships between AI literacy, curriculum integration, and library science education highlight the promising transformative change potential of AI literacy integration into future librarian curricula. AI literacy frameworks offer the skills students need to both understand and operate AI systems. Institutions can solve some of the problems related to teacher readiness, resource compatibility, and ethical issues by designing curriculum in such a way that students will be able to address the needs of an AI-driven workforce and society.

Table 3: List of Literature on AI Literacy, Curriculum Integration and Library Science Education

Authors	Title	Source title	Cited by
Olari et al. (2023)	Introduction of Artificial Intelligence Literacy and Data Literacy in Computer Science Teacher Education	ACM International Conference Proceeding Series	2
Merceron & Best (2024)	Integrating Professional Perspectives for AI Literacy: Empowering Students in an AI-Influenced Future	The Role of Generative AI in the Communication Classroom	1

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A. S (2024)	Fostering AI Literacy for Future Librarians	College and Undergraduate Libraries	0
Ndungu (2024)	Integrating Basic Artificial Intelligence Literacy into Media and Information Literacy Programs in Higher Education: A Framework for Librarians and Educators	Journal of Information Literacy	0
Chatikobo & Pasipamire (2024)	Readiness to Embrace Artificial Intelligence in Information Literacy Instruction at a Zimbabwean University	Cogent Education	0

Conclusion

The study highlight important academic librarians are in helping people understand AI, using their skills in managing information, ethics, and working with different fields to encourage responsible use of AI in research and other areas. The findings shows that AI literacy has the ability to change the services of a library, improve how research is done, and help students get ready for AI-driven futures. Thus, this study has achieved its main objectives. However, this study was conducted through the analysis of previously available literature and abstracts only, which may have excluded enlightening some of the specific intersections between AI literacy, information literacy models, and other domains such as academic integrity or media literacy. Secondly, the study's limitation is the emphasis on academic librarianship only, which simplifies the applicability of its findings to other areas of profession, such as secondary education or industry settings. Lastly, the research did not gather data from direct observation or field experiments in the form of evidence, therefore its base was only the literature and the existing literature and abstracts. By bridging theory and practice, it lays the groundwork for future research and innovation in AI literacy, ensuring that learners and professionals are equipped to engage responsibly and effectively with AI technologies.

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