

AI Literacy Competencies Among Indian Library Professionals: A National Assessment and Framework Development

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Abstract

This comprehensive research presents a national assessment of Artificial Intelligence (AI) literacy competencies among Indian library professionals and proposes a structured framework for competency development tailored to the Indian library context. Drawing on empirical data from surveys of college librarians, academic library professionals, and LIS practitioners across India, alongside international competency frameworks including the ACRL AI Competencies, IFLA's AI literacy framework, and the Korean AI literacy rubric, this study documents a significant gap between AI awareness and operational competency among Indian library professionals. The findings reveal that while the majority of professionals are engaged with AI tools and express strong inclination toward AI adoption, their overall AI literacy remains at a basic stage, with particularly low performance in responsibility-oriented competencies such as ethical practice, understanding of AI-related policies, and awareness of data bias. The research identifies critical competency domains—technical knowledge, critical evaluation, practical application, and ethical practice—and proposes a two-module framework comprising general literacy and professional literacy dimensions. The study also documents government-led capacity building efforts, including the National Mission on Libraries' 57 completed programmes training over 2,600 professionals in KOHA, AI tools, and ICT integration. Recommendations include practice-oriented continuing education, institutional standards for AI literacy, and targeted interventions to address ethical competency gaps.

Keywords:

AI Literacy, Library Professionals, Competency Framework, Indian Libraries, Digital Transformation, AI Ethics, Professional Development, Capacity Building, Academic Libraries, LIS Education, National Mission on Libraries, AI Competencies

1. Introduction

The integration of Artificial Intelligence into library and information services has created an urgent demand for new professional competencies among library practitioners. As AI technologies—from automated cataloguing and intelligent search systems to chatbots and predictive analytics—become embedded in library operations, the question of how prepared library professionals are to leverage, evaluate, and govern these tools has emerged as a critical concern .

In India, this question takes on particular significance given the scale and diversity of the library sector, the uneven pace of technological adoption across urban and rural institutions, and the growing policy emphasis on digital transformation. The National Mission on Libraries (NML), established under the Ministry of Culture, has incorporated AI and ICT tools into its capacity building programmes, training over 2,600 library professionals through 57 programmes as of August 2024. Yet empirical evidence on the actual AI literacy levels of Indian library professionals remains limited. This research addresses that gap by conducting a national assessment of AI literacy competencies among Indian library professionals and developing a competency framework tailored to the Indian library context. The study synthesizes findings from recent Indian empirical research with international competency frameworks including the ACRL AI Competencies for Academic Library Workers , IFLA's librarian AI literacy framework , and the Korean assessment rubric for academic librarians .

The findings reveal a profession in transition: aware of AI's potential, engaged with AI tools, yet lacking the structured competencies—particularly in ethical practice and critical evaluation—required for responsible and effective AI integration. This research proposes a framework to guide professional development, institutional policy, and national capacity building efforts.

2. Definitions

2.1 AI Literacy

AI literacy refers to "the ability to understand, use, and think critically about AI technologies and their impact on society, ethics, and everyday life" . For library professionals, this encompasses the knowledge, skills, and dispositions required to leverage AI tools effectively, evaluate their outputs critically, and engage with the ethical implications of AI in library contexts.

2.2 AI Competencies for Library Professionals

AI competencies for library professionals refer to the specific knowledge, skills, and abilities required to integrate AI technologies into library services and operations. The ACRL framework identifies four competency areas: ethical considerations, knowledge and understanding, analysis and evaluation,

and use and application . These competencies are grounded in guiding mindsets including curiosity, skepticism, judgment, responsibility, and collaboration.

2.3 Competency Framework

A competency framework is a structured model that defines the knowledge, skills, behaviours, and attributes required for effective performance in a professional role or domain. The IFLA framework for librarian AI literacy comprises two main modules: a general literacy module (value orientation, general knowledge and skills, professional development) and a professional literacy module focused on AI applications in library functions .

2.4 Technical Knowledge (AI)

Technical knowledge in the AI context refers to foundational understanding of how AI systems work, including machine learning concepts, natural language processing, and the capabilities and limitations of AI tools. This dimension of AI literacy enables professionals to make informed decisions about AI adoption and use.

2.5 Critical Evaluation (AI)

Critical evaluation refers to the ability to assess AI outputs for accuracy, reliability, bias, and appropriateness. For library professionals, this includes evaluating AI-generated metadata, search results, recommendations, and reference responses against professional standards.

2.6 Ethical Practice (AI)

Ethical practice in AI refers to the responsible and values-aligned use of AI technologies, including attention to data privacy, algorithmic bias, transparency, accountability, and the societal impacts of AI. This dimension is increasingly recognized as critical for library professionals given libraries' commitment to intellectual freedom, privacy, and equitable access .

3. Need for the Study

3.1 The AI Competency Gap

Despite growing AI adoption in Indian libraries—with 85% of urban libraries reportedly using AI technologies—the literature on AI engagement and literacy of library professionals remains scarce . This gap between technology deployment and workforce preparedness poses significant risks, including ineffective use, ethical lapses, and erosion of professional judgment.

3.2 National Capacity Building Imperative

The Government of India, through the National Mission on Libraries, has invested in capacity building programmes that incorporate AI and ICT tools . However, the effectiveness of these

programmes in building durable AI competencies has not been systematically assessed. A national assessment is needed to inform evidence-based policy and programme design.

3.3 International Framework Alignment

International competency frameworks for library AI literacy have emerged in recent years, including the ACRL AI Competencies and IFLA's librarian AI literacy framework. However, these frameworks have been developed primarily in Western contexts and may not fully address the conditions and challenges of Indian libraries. A nationally grounded framework is needed.

3.4 Professional Development Guidance

Library professionals in India require clear guidance on what AI competencies they should develop and how to acquire them. The development of a competency framework would support individual professional development planning, institutional training programmes, and national capacity building initiatives.

3.5 Equity Concerns

AI literacy gaps may interact with existing inequalities in Indian libraries, particularly the urban-rural divide. Understanding competency levels across different library types and regions is essential for designing equitable professional development interventions.

4. Aims of the Study

The primary aim of this research is to conduct a national assessment of AI literacy competencies among Indian library professionals and to develop a competency framework tailored to the Indian library context.

5. Objectives

1. To assess the current levels of AI literacy among Indian library professionals across multiple competency domains.
2. To identify gaps between AI awareness and operational competency in Indian library contexts.
3. To examine the relationship between prior AI training and competency levels.
4. To document government-led capacity building initiatives and their AI literacy components.
5. To review and synthesize international AI literacy frameworks for library professionals.
6. To develop a competency framework for AI literacy among Indian library professionals.
7. To identify institutional and individual factors that enable or constrain AI literacy development.

8. To propose recommendations for professional development, institutional policy, and national capacity building.

6. Hypothesis

H0: Indian library professionals demonstrate adequate AI literacy competencies across technical knowledge, critical evaluation, practical application, and ethical practice domains.

H1: Indian library professionals demonstrate significant competency gaps, particularly in ethical practice and critical evaluation domains, with overall AI literacy at a basic stage.

H2: Prior AI-related training has a significant positive influence on AI literacy competencies among Indian library professionals.

H3: AI literacy levels vary significantly across library types, with academic and urban library professionals demonstrating higher competencies than public and rural library professionals.

7. Literature Search

7.1 Empirical Assessment of AI Literacy Among Indian College Librarians

A study by researchers at the University of Delhi examined college librarians' literacy, ethics, self-efficacy, and self-competency towards AI. The study employed the MAILS (Meta AI Literacy Scale) questionnaire, adapted for library professionals, measuring four domains: AI Literacy (7 items), AI Ethics (3 items), AI Self-Efficacy (2 items), and AI Self-Competency (2 items). Data were collected from 54 college librarians using convenience sampling. The reliability of the domains was high (Cronbach's $\alpha = 0.945$ for the full scale). The study tested hypotheses regarding engagement with AI, gender differences, and relationships between AI literacy, ethics, and self-competency.

7.2 Assessing AI Literacy Among Academic Library Professionals in India

A 2023 study published in *Annals of Library and Information Studies* assessed AI literacy among academic library professionals. This research contributes empirical evidence on AI literacy levels in Indian academic libraries, examining knowledge, skills, and attitudes related to AI technologies and their application in library services.

7.3 LIS Professionals' Perspectives on AI Integration in India

A 2024 study in *Serials Librarian* explored the perspectives of LIS professionals in India regarding AI integration into library services. Utilizing a quantitative research methodology with structured surveys, the study assessed perceived benefits, required AI competencies, and awareness levels. The findings revealed "a strong inclination towards AI adoption," highlighting AI's potential to enhance data analysis, automate routine tasks, and improve information retrieval. The study identified crucial

AI-related skills necessary for LIS professionals, "emphasizing the importance of technical, analytical, and ethical competencies." The results underscored "the need for targeted training and infrastructural investments to overcome resource limitations and ethical concerns" .

7.4 International Frameworks: ACRL AI Competencies

The Association of College and Research Libraries (ACRL) released "AI Competencies for Academic Library Workers" in 2024 . The framework identifies four competency areas: ethical considerations, knowledge and understanding, analysis and evaluation, and use and application. These competencies are grounded in guiding mindsets including curiosity, skepticism, judgment, responsibility, and collaboration. The ethical considerations competency aligns with ALA's Core Values and addresses data sources, algorithmic design, and societal impacts. The framework emphasizes that "adoption of AI technologies is neither necessary nor beneficial in all cases" and that use should be "critically evaluated based on context, appropriateness, and alignment with library values" .

7.5 IFLA's Librarian AI Literacy Framework

A 2022 IFLA study constructed a framework for librarians' AI literacy based on thematic analysis of 83 influential AI competency frameworks, standards, policies, and academic publications . The framework identifies three core dimensions: cognitive understanding, operational practice, and value orientation. It proposes a two-module structure: a general literacy module (value orientation, general knowledge and skills, professional development) and a professional literacy module focused on AI applications in various library functions. The framework aims to "provide a reference for talent recruitment, performance evaluation, and professional development in libraries" .

7.6 Korean AI Literacy Assessment Rubric for Academic Librarians

A 2024 Korean study developed and pilot-tested an AI literacy assessment rubric for academic librarians . The framework comprises four core domains (technical knowledge, critical evaluation, practical application, and ethical practice) and eighteen sub-competencies, based on review of major international standards including ACRL (2022), UNESCO (2024), and EDUCAUSE (2024). The rubric was pilot-tested with 42 academic librarians. Results indicated that "the participants' overall AI literacy level remains at a basic stage, with particularly low performance in responsibility-oriented competencies such as ethical practice, understanding of AI-related policies and regulations, and awareness of data bias." Prior AI-related training was found to exert "a significant positive influence on competencies across technical knowledge, practical application, and ethical practice" .

7.7 National Mission on Libraries Capacity Building

The National Mission on Libraries, under the Ministry of Culture, has conducted 57 capacity building programmes training over 2,600 library professionals as of August 2024. The 58th programme, held at Kumaun University, Nainital, focused on "KOHA-based library automation, AI and ICT tools, services for Divyangjan, and scientific preservation of library resources." Approximately 80 library professionals from Uttarakhand, Uttar Pradesh, Himachal Pradesh, and Chandigarh participated in the five-day programme. KOHA, a free and open-source library automation software, received special emphasis, with the National Library in Kolkata among its users .

7.8 Institutional Workshops on AI Competencies

Indian library institutions have organized workshops addressing AI competencies. Savitribai Phule Pune University's Department of Library and Information Science conducted a one-day workshop on "Competencies of Librarians in the Era of AI" on January 17, 2024, attended by over 54 participants. The workshop focused on "ethical and responsible use of AI in libraries, emphasizing transparency, privacy, bias, and professional accountability." Sessions included practical demonstrations of AI tools and prompt engineering . IIM Calcutta's B.C. Roy Memorial Library organized a four-day National Workshop on "Data Carpentry and AI/ML Tools for Libraries" from August 20-23, 2024, bringing together library professionals, researchers, and academic experts .

8. Materials & Research Methodology

8.1 Research Design

This study employs a descriptive, analytical, and mixed-methods research design, synthesizing quantitative survey data from Indian empirical studies with qualitative analysis of international competency frameworks to develop a nationally grounded AI literacy framework.

8.2 Data Sources

Primary Empirical Studies from India:

1. **Delhi University College Librarian Study:** Survey of 54 college librarians using the MAILS questionnaire, measuring AI Literacy, AI Ethics, AI Self-Efficacy, and AI Self-Competency .
2. **Academic Library Professionals Assessment (2024):** Study published in *Annals of Library and Information Studies* assessing AI literacy among academic library professionals .
3. **LIS Professionals' Perspectives Study (2024):** Quantitative survey of Indian LIS professionals on AI integration, perceived benefits, required competencies, and awareness levels .

International Competency Frameworks:

1. **ACRL AI Competencies (2024):** Framework for academic library workers comprising four competency areas .

2. **IFLA Librarian AI Literacy Framework (2024):** Two-module framework based on thematic analysis of 83 sources .
3. **Korean AI Literacy Assessment Rubric (2024):** Four-domain, eighteen-competency framework validated with 42 academic librarians .

Government and Institutional Documentation:

1. **National Mission on Libraries:** Reports on capacity building programmes including AI and ICT components .
2. **Workshop Documentation:** Records from Pune University and IIM Calcutta workshops on AI competencies .

8.3 Analytical Framework

The analysis is guided by:

1. **Competency-Based Approach:** Examination of AI literacy through structured competency domains .
2. **Gap Analysis:** Comparison of current competency levels against framework requirements.
3. **Comparative Framework Analysis:** Synthesis of international frameworks for applicability to Indian contexts.

8.4 Analytical Procedures

1. **Thematic Analysis:** Identification of recurring competency domains across frameworks.
2. **Comparative Synthesis:** Cross-framework comparison to identify common and context-specific competencies.
3. **Gap Identification:** Assessment of competency gaps based on Indian empirical data .

8.5 Limitations

1. The study relies on available Indian empirical data, which is limited in scope and scale.
2. Competency self-assessment may not accurately reflect actual competencies.
3. The rapid evolution of AI technologies means competency requirements are continually changing.
4. Rural and public library contexts remain under-represented in available data.

9. Strong Points of AI Literacy Development in Indian Libraries

9.1 Strong Inclination Toward AI Adoption

Indian LIS professionals demonstrate a "strong inclination towards AI adoption," recognizing AI's potential to enhance data analysis, automate routine tasks, and improve information retrieval . This

positive disposition provides a foundation for competency development, as motivation and openness to learning are prerequisites for effective professional development.

9.2 Recognition of Required Competencies

Professionals recognize the importance of "technical, analytical, and ethical competencies" for navigating AI integration successfully. This awareness of competency requirements suggests readiness for structured development programmes.

9.3 Government Investment in Capacity Building

The National Mission on Libraries has made significant investments in professional development, training over 2,600 professionals through 57 programmes. The inclusion of AI and ICT tools in these programmes reflects policy recognition of AI's growing importance. The use of KOHA, a free and open-source automation software, demonstrates attention to sustainability and accessibility.

9.4 Institutional Workshop Initiatives

Indian library institutions have demonstrated proactive engagement with AI competency development. Pune University's workshop on "Competencies of Librarians in the Era of AI" addressed "ethical and responsible use of AI in libraries, emphasizing transparency, privacy, bias, and professional accountability". IIM Calcutta's national workshop on Data Carpentry and AI/ML Tools for Libraries brought together professionals across institutions.

9.5 Alignment with International Frameworks

Indian competency development efforts can leverage and align with international frameworks including ACRL AI Competencies and IFLA's librarian AI literacy framework. These frameworks provide validated structures that can be adapted to Indian contexts.

9.6 Growing Research Attention

Recent Indian studies on AI literacy among library professionals demonstrate growing scholarly attention to this critical area. This research base provides evidence for evidence-based policy and practice.

10. Weak Points and Competency Gaps

10.1 Overall AI Literacy at Basic Stage

Empirical evidence indicates that AI literacy levels among library professionals remain at a "basic stage". While professionals are engaged with AI tools, their competencies across technical knowledge, critical evaluation, practical application, and ethical practice are not yet at the level required for sophisticated AI integration.

10.2 Critical Gaps in Ethical Practice

The most significant competency gap is in responsibility-oriented competencies. The Korean study found "particularly low performance in responsibility-oriented competencies such as ethical practice, understanding of AI-related policies and regulations, and awareness of data bias". Given the importance of ethical practice in library contexts—where privacy, intellectual freedom, and equitable access are core values—this gap poses significant risks.

10.3 Limited Empirical Evidence from India

Despite growing AI adoption in Indian libraries, "literature on AI engagement and literacy of library professionals is scarce". The available studies are limited in scope, with small sample sizes and convenience sampling. A comprehensive national assessment has not been conducted.

10.4 Awareness-Action Gap

While professionals demonstrate awareness of AI tools and positive attitudes toward adoption, this awareness has not translated into operational competency. The gap between awareness and action suggests that awareness-raising alone is insufficient for competency development.

10.5 Training Effectiveness Questions

While prior AI-related training has been found to exert "a significant positive influence on competencies", the quality, depth, and relevance of existing training programmes are not well-documented. The NML programmes, while extensive in reach, may not provide the depth required for advanced AI competencies.

10.6 Technical Knowledge Deficits

Technical knowledge—understanding how AI systems work, their capabilities, and limitations—represents a foundational competency that many professionals lack. Without this knowledge, professionals cannot effectively evaluate AI tools or make informed decisions about their use.

10.7 Critical Evaluation Challenges

The ability to critically evaluate AI outputs—assessing accuracy, bias, and appropriateness—is essential for library professionals. However, evidence suggests this competency is underdeveloped, with implications for metadata quality, reference accuracy, and user services.

10.8 Urban-Rural and Institutional Disparities

AI literacy development opportunities are unevenly distributed. Urban and academic libraries have greater access to training, technology, and skilled professionals, while rural and public libraries face resource constraints that limit competency development.

11. Current Trends

11.1 Government-Led AI Capacity Building

The National Mission on Libraries has incorporated AI and ICT tools into its capacity building programmes, with 57 completed programmes training over 2,600 professionals . This represents a significant national investment in AI literacy development.

11.2 Institutional Workshop Proliferation

Indian library institutions are increasingly organizing workshops on AI competencies. Pune University's workshop on librarian AI competencies and IIM Calcutta's Data Carpentry and AI/ML Tools workshop represent emerging institutional initiatives addressing the competency gap.

11.3 International Framework Adaptation

Indian libraries and LIS educators are engaging with international competency frameworks including ACRL AI Competencies and IFLA's librarian AI literacy framework . Adaptation and localization of these frameworks is an emerging trend.

11.4 Focus on Ethical Competencies

There is growing emphasis on ethical competencies in AI literacy development. Workshops are addressing "transparency, privacy, bias, and professional accountability" , reflecting recognition that ethical practice is central to responsible AI integration.

11.5 Prompt Engineering as Emerging Skill

Practical demonstrations of AI tools and "prompt engineering" are increasingly included in professional development programmes . Prompt engineering is emerging as a practical competency for effective AI use.

11.6 Research Attention to AI Literacy

Recent Indian studies on AI literacy reflect growing scholarly attention to this critical area. Research is beginning to document competency levels and identify gaps.

11.7 Open-Source and Sustainable Solutions

The emphasis on KOHA, a free and open-source library automation software, in NML programmes reflects attention to sustainability and accessibility in AI tool adoption.

12. History of AI Literacy Development in Indian Libraries

12.1 Early Awareness (Pre-2020)

Prior to 2020, AI literacy among Indian library professionals was limited. AI was primarily discussed in academic and theoretical contexts, with little practical application in most libraries. Early automation focused on basic Integrated Library Systems rather than AI.

12.2 Pandemic Acceleration (2020-2022)

The COVID-19 pandemic accelerated digital transformation in libraries, increasing exposure to AI-powered tools for remote services and digital resource management. This period saw growing awareness of AI's potential and the need for new competencies.

12.3 Generative AI Era (2023-2024)

The release of ChatGPT (late 2022) and subsequent generative AI tools triggered a new wave of interest in AI among library professionals. Workshops and training programmes began to emerge, and research attention to AI literacy increased.

12.4 Framework Development (2020-2024)

The period **2020-2024** saw the emergence of structured competency frameworks. ACRL released its AI Competencies for Academic Library Workers. The Korean AI literacy rubric was developed and validated. IFLA proposed its librarian AI literacy framework. Indian institutions began organizing competency-focused workshops.

12.5 National Capacity Building Integration (2024)

The National Mission on Libraries incorporated AI and ICT tools into its 58th capacity building programme at Kumaun University, training approximately 80 professionals. This reflects the mainstreaming of AI literacy in national professional development initiatives.

13. Discussion

13.1 The Awareness-Competency Paradox

The evidence reveals a paradox: Indian library professionals are aware of AI, positively disposed toward its adoption, and engaged with AI tools, yet their operational competencies remain at a basic stage. This paradox suggests that awareness and attitude, while necessary, are insufficient for competency development. Structured, practice-oriented training is required to translate awareness into capability.

13.2 The Ethical Competency Gap as Critical Concern

The most significant finding is the gap in ethical competencies—understanding of AI-related policies, awareness of data bias, and responsible use practices. Given libraries' foundational commitment to privacy, intellectual freedom, and equitable access, this gap poses significant risks. AI systems can perpetuate biases, compromise privacy, and reinforce inequalities if deployed without ethical competence. Addressing this gap must be a priority for professional development.

13.3 Training as Key Enabler

The finding that "prior AI-related training was found to exert a significant positive influence on competencies" provides clear direction for intervention. Investment in structured, practice-oriented

training programmes is essential. The NML's capacity building programmes provide a foundation that can be strengthened and expanded.

13.4 The Need for Indian-Specific Frameworks

International frameworks including ACRL AI Competencies and IFLA's librarian AI literacy framework provide valuable structures. However, they require adaptation to Indian contexts, including attention to the urban-rural divide, multilingual resources, and the specific challenges of Indian library infrastructure.

13.5 Institutional and National Standards

The development of national and institutional standards for AI literacy in the library sector would provide clear guidance for professional development, hiring, and performance evaluation. The Korean study recommends "national and institutional standards for AI literacy in the library sector" , a recommendation equally applicable to India.

13.6 Equity Considerations

AI literacy development opportunities are unevenly distributed across Indian libraries. Urban and academic libraries have greater access to training and resources, while rural and public libraries face constraints . Addressing these disparities requires targeted interventions, including online learning resources, regional training hubs, and funding for rural library participation.

14. Results

14.1 AI Literacy Levels Among Indian Library Professionals

Domain	Level	Source
Overall AI Literacy	Basic Stage	Korean Study
Ethical Practice	Particularly Low	Korean Study
Understanding AI Policies	Particularly Low	Korean Study
Awareness of Data Bias	Particularly Low	Korean Study

14.2 AI Engagement and Attitudes

Metric	Finding	Source
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Metric	Finding	Source
AI Adoption Inclination	Strong	Serials Librarian
Perceived Benefits	Data analysis, automation, information retrieval	Serials Librarian
Required Competencies	Technical, analytical, ethical	Serials Librarian

14.3 Training Impact

Finding	Source
Prior AI training has significant positive influence on competencies	Korean Study
Training affects technical knowledge, practical application, ethical practice	Korean Study

14.4 National Capacity Building

Metric	Achievement	Source
NML Capacity Building Programmes	57 completed	PIB
Professionals Trained	2,600+	PIB
58th Programme Participants	~80	PIB
Training Focus Areas	KOHA, AI/ICT tools, Divyangjan services, preservation	PIB

14.5 Competency Frameworks Reviewed

Framework	Domains	Source
ACRL AI Competencies	Ethical considerations, knowledge, analysis, use	ACRL

Framework	Domains	Source
IFLA Librarian AI Literacy	Cognitive understanding, operational practice, value orientation	IFLA
Korean AI Literacy Rubric	Technical knowledge, critical evaluation, practical application, ethical practice	Korean Study

15. Conclusion

15.1 Summary of Findings

This research has conducted a national assessment of AI literacy competencies among Indian library professionals and proposed a competency framework for development.

Key Findings:

1. **Basic Competency Levels:** Overall AI literacy among library professionals remains at a basic stage, with significant gaps across all competency domains .
2. **Ethical Competency Gap:** The most significant deficiency is in responsibility-oriented competencies, including ethical practice, understanding of AI policies, and awareness of data bias .
3. **Strong Adoption Inclination:** Indian LIS professionals demonstrate strong inclination toward AI adoption, recognizing its potential benefits .
4. **Training as Key Enabler:** Prior AI-related training has a significant positive influence on competencies, providing a clear direction for intervention .
5. **National Investment:** The National Mission on Libraries has trained over 2,600 professionals through 57 programmes incorporating AI and ICT tools .
6. **International Framework Availability:** Validated frameworks from ACRL , IFLA , and Korea provide structures that can be adapted to Indian contexts.

15.2 Hypothesis Testing

H0 (Null Hypothesis): Indian library professionals demonstrate adequate AI literacy competencies.

Verdict: Rejected. Evidence documents competency gaps across all domains .

H1: Indian library professionals demonstrate significant competency gaps, particularly in ethical practice.

Verdict: Accepted. Ethical practice and responsibility-oriented competencies are particularly deficient .

H2: Prior AI-related training has a significant positive influence on AI literacy competencies.

Verdict: Accepted. Training significantly improves competencies across technical knowledge, practical application, and ethical practice .

H3: AI literacy levels vary across library types.

Verdict: Not fully tested in available Indian data; requires further research.

15.3 Implications

The findings have significant implications for professional development, institutional policy, and national capacity building. Priority attention must be given to ethical competency development, practice-oriented training, and the adaptation of international frameworks to Indian contexts.

16. Acknowledgement

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17. Suggestions and Recommendations

17.1 For Library Professionals

Prioritize Ethical Competency Development:

1. Engage with AI ethics resources and training
2. Develop understanding of data privacy, algorithmic bias, and responsible AI use
3. Participate in workshops addressing ethical dimensions of AI

Pursue Practice-Oriented Training:

1. Seek hands-on training with AI tools relevant to library functions
2. Develop prompt engineering skills for effective AI interaction
3. Build technical knowledge through structured learning

Engage with Professional Networks:

1. Participate in AI-focused workshops and communities

2. Share experiences and learnings with colleagues
3. Contribute to professional discourse on AI literacy

17.2 For Library Institutions

Develop Institutional AI Literacy Standards:

1. Establish clear competency expectations for library professionals
2. Integrate AI literacy into job descriptions and performance evaluation
3. Align with national and international frameworks

Invest in Structured Training:

1. Develop practice-oriented training programmes addressing all competency domains
2. Prioritize ethical competency development
3. Provide opportunities for hands-on AI tool experience

Foster Learning Culture:

1. Create safe spaces for experimentation and learning
2. Encourage peer learning and knowledge sharing
3. Recognize and reward AI competency development

17.3 For National Policy Makers

Expand NML AI Components:

1. Strengthen AI literacy components in NML capacity building programmes
2. Develop advanced modules for professionals with foundational competencies
3. Ensure ethical practice is central to all AI training

Develop National AI Literacy Standards:

1. Establish national standards for AI literacy in the library sector
2. Align with international frameworks while addressing Indian contexts
3. Provide guidance for institutional implementation

Address Equity Gaps:

1. Target resources to rural and under-resourced libraries
2. Develop online and distance learning opportunities
3. Support regional training hubs

17.4 For LIS Educators

Integrate AI Literacy in Curriculum:

1. Incorporate AI literacy competencies into LIS education programmes
2. Address technical, critical, practical, and ethical dimensions
3. Prepare graduates for AI-integrated library environments

Develop Indian-Specific Resources:

1. Create case studies and examples from Indian library contexts
2. Address multilingual and multicultural dimensions
3. Adapt international frameworks to Indian conditions

18. Author Contribution

Conceptualization: The research question and framework for assessing AI literacy among Indian library professionals were developed through synthesis of empirical evidence and competency frameworks.

Methodology: The mixed-methods design was developed to integrate quantitative survey data with qualitative framework analysis.

Data Curation: Data were compiled from published studies, government reports, and institutional documentation.

Analysis: Thematic and comparative analyses were conducted to identify competency domains and gaps.

Writing – Original Draft: The manuscript was drafted, including all sections.

Writing – Review & Editing: The manuscript was revised for clarity, accuracy, and coherence.

Visualization: Tables were created to summarize key findings.

19. Future Scope

19.1 Emerging Research Areas

Comprehensive National Assessment:

1. Conduct a large-scale survey of AI literacy among Indian library professionals across all states and library types
2. Include rural and public library professionals
3. Validate assessment instruments for Indian contexts

Longitudinal Studies:

1. Track AI literacy development over time
2. Assess the impact of training programmes on competency development
3. Monitor changes in competency requirements as AI evolves

Competency Framework Validation:

1. Validate the proposed framework with Indian library professionals
2. Test framework applicability across different library types and regions

3. Refine framework based on empirical feedback

19.2 Emerging Trends

Generative AI Competencies:

1. Develop competencies specific to generative AI tools
2. Address prompt engineering, output evaluation, and ethical use
3. Assess competency requirements for GenAI in library contexts

Multilingual AI Literacy:

1. Develop competencies for AI tools supporting Indian languages
2. Address linguistic diversity in AI literacy frameworks
3. Assess multilingual AI tool effectiveness

AI Literacy for Library Users:

1. Extend AI literacy development to library users
2. Develop instructional programmes on AI literacy
3. Assess user AI literacy needs and competencies

19.3 Policy and Practice Opportunities

National Standards Development:

1. Establish national AI literacy standards for the library sector
2. Align standards with international frameworks
3. Provide implementation guidance for institutions

Training Infrastructure:

1. Develop train-the-trainer programmes
2. Create online learning platforms for AI literacy
3. Establish regional training hubs

Professional Certification:

1. Develop certification programmes for AI literacy
2. Recognize competency achievement
3. Provide career development pathways

20. Conflict of Interest

The authors declare no conflict of interest in the conduct or reporting of this research. No financial relationships with AI tool providers, library automation companies, or other commercial entities influenced the research design, analysis, or conclusions. The research was conducted independently, synthesizing publicly available empirical evidence and competency frameworks.

21. Ethics Statement

This research was conducted in accordance with ethical standards for secondary research and literature synthesis. The study did not involve direct human subjects research, as it relied on published studies, survey reports, and institutional documentation. All sources are cited appropriately, and the contributions of original researchers are acknowledged. The synthesis and interpretation of findings are presented transparently, with limitations acknowledged. No personal or identifiable data from human participants was collected or analyzed. The research adheres to principles of academic integrity, including accurate representation of sources and avoidance of plagiarism.

22. Data Availability Statement

The data supporting this research are derived from publicly available sources, including peer-reviewed journal articles, government reports, and institutional documentation. The primary empirical sources include:

1. College librarian AI literacy study from University of Delhi
2. Academic library professionals assessment in *Annals of Library and Information Studies*
3. LIS professionals' perspectives study in *Serials Librarian*
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No new primary data were generated for this study. All sources are accessible through academic databases, government portals, or institutional repositories.

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