AI Automation and Digital Content Creation: Emerging Roles for Librarians in Academic Libraries the Digital Age: A Systematic Literature Review

By

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Abstract

This study systematically reviewed the application of artificial intelligence (AI) in digital content creation within academic libraries, with emphasis on emerging technologies, evolving librarian roles, required competencies, and ethical challenges. The review followed the Preferred Reporting Items for Systematic Reviews and Meta Analyses (PRISMA) 2020 guidelines. Literature published between 2018 and June 2026 was retrieved from Scopus, Web of Science, ERIC, Library and Information Science Source (EBSCOhost), ScienceDirect, and Google Scholar. A total of 790 records were identified, of which 35 studies met the predefined inclusion criteria and were synthesized using a narrative thematic approach. The findings reveal that generative AI, machine learning, natural language processing, automated metadata generation, speech to text technologies, and AI powered translation tools are increasingly transforming digital content creation and information services in academic libraries. AI has expanded librarians' professional roles beyond traditional information management to include digital content creation, research support, digital scholarship, AI literacy instruction, institutional repository management, and AI governance. The review further identified AI literacy, information literacy, metadata management, digital content development, data analytics, cybersecurity, cloud computing, and critical thinking as essential competencies for effective AI adoption. However, inadequate digital infrastructure, limited funding, insufficient professional training, and outdated curricula remain major barriers, particularly in developing countries. Ethical and legal concerns, including algorithmic bias, misinformation, copyright, intellectual property, data privacy, transparency, and accountability, also emerged as significant challenges requiring robust institutional governance. The study concludes that responsible AI adoption in academic libraries depends on sustained investment in digital infrastructure, continuous professional development, curriculum reform, and comprehensive AI governance frameworks. It also highlights the need for further empirical research on AI implementation in African academic libraries, particularly within the Nigerian context.

Keywords: Artificial intelligence, academic libraries, digital content creation, librarians, AI competencies, digital scholarship, systematic literature review, PRISMA.

Introduction

Artificial intelligence (AI) has emerged as one of the most transformative technologies of the twenty first century, fundamentally changing how information is created, organized, accessed, disseminated, and consumed. Advances in generative AI, machine learning, natural language processing, and intelligent automation have revolutionized digital content creation by enabling the rapid production of text, images, audio, video, and other multimedia resources (Anantrasirichai et al., 2026; Mucci, 2024). These technologies have significantly reduced the time, cost, and technical expertise required to create digital content while enhancing productivity, creativity, and knowledge dissemination. Consequently, AI is reshaping teaching, learning, research, and scholarly communication across higher education institutions (Adamakis & Rachiotis, 2025; Popenici & Kerr, 2017).

Academic libraries are increasingly adopting AI technologies to improve information management and service delivery. Traditionally responsible for acquiring, organizing, preserving, and providing access to information resources, librarians now use AI to support automated cataloguing, metadata generation, intelligent indexing, semantic searching, virtual reference services, digital preservation, and personalized information retrieval (Thinh, 2026; Boateng, 2025; Mahmud, 2024). Generative AI has further expanded opportunities for librarians to create research guides, instructional materials, multimedia tutorials, institutional repository content, and library marketing resources that enhance teaching, learning, and research. The widespread application of AI technologies in academic libraries is transforming not only library operations and service delivery but also the competencies and professional responsibilities expected of librarians (Majumdar, 2026; Library Connect, 2025).

The growing integration of AI has redefined the professional roles of librarians, requiring them to develop new competencies for AI enabled digital content creation and innovative information service delivery. Beyond their traditional responsibilities, librarians are increasingly serving as digital content creators, AI facilitators, digital scholarship specialists, research support professionals, data stewards, and educators in AI and information literacy (Miltenoff, 2024). Their responsibilities now include guiding users in the ethical use of AI, evaluating AI generated information, promoting information literacy, supporting open educational resources, managing institutional repositories, and ensuring compliance with copyright and academic integrity standards. In developed countries, AI has become an integral part of academic library services, with librarians playing leading roles in digital scholarship, research support, AI literacy, and institutional AI policy development (Ali & Richardson, 2025; Michalak, 2023).

Despite these advances, AI adoption in many developing countries, including Nigeria, remains constrained by inadequate digital infrastructure, unstable internet connectivity, limited funding, insufficient technical expertise, inadequate professional training, and weak institutional AI policies (Mada, 2025; Haruna, 2025; Idiegbeyan Ose & Idahosa, 2025). Although existing studies have examined AI applications such as chatbots, metadata automation, digital reference services, and intelligent information retrieval, the literature remains fragmented and provides limited synthesized evidence on how AI is transforming librarians' roles in digital content creation.

Consequently, this systematic literature review synthesizes existing evidence on the emerging roles of librarians in AI enabled digital content creation by examining AI technologies, professional competencies, institutional strategies, implementation challenges,

ethical considerations, and future research directions. The review contributes to the literature by providing a comprehensive understanding of how AI is transforming librarianship and offers evidence based insights to guide policy, professional practice, capacity building, and responsible AI adoption in academic libraries, particularly in developing countries such as Nigeria.

Statement of the Problem

AI is transforming digital content creation in higher education by automating the generation, organization, and dissemination of scholarly and educational resources. As AI adoption expands, academic librarians are increasingly expected to move beyond traditional information management roles to support AI enabled content creation, digital scholarship, research support, AI literacy, and the ethical management of AI generated information. Although numerous studies have examined specific AI applications, such as chatbots, automated cataloguing, metadata generation, and generative AI tools, the evidence remains fragmented and largely technology focused. There is limited synthesized knowledge on how AI automation is collectively reshaping librarians' professional roles, the competencies required, the challenges encountered, and the ethical, legal, and professional issues associated with AI enabled digital content creation. This gap limits the ability of library managers, university administrators, policymakers, and professional associations to develop evidence based strategies for AI adoption and workforce development. Therefore, a systematic literature review is needed to integrate existing evidence on AI enabled digital content creation in academic libraries by identifying key AI technologies, examining the emerging roles and competencies of librarians, evaluating implementation challenges and ethical implications, and highlighting priorities for policy, professional practice, and future research.

Research Questions

The following research questions were answered in this study:

- What AI technologies are being applied to digital content creation in academic libraries?
- What emerging roles are librarians performing in AI enabled digital content creation?
- What competencies are required for librarians to effectively utilize AI technologies in digital content creation?
- What ethical, legal, and professional issues are associated with AI enabled digital content creation?

Literature review

AI technologies applied to digital content creation in academic libraries

Empirical evidence shows that academic libraries across developed and developing countries are increasingly integrating AI technologies into digital content creation to improve research support, information organization, and resource accessibility. However, adoption patterns differ according to technological infrastructure, institutional priorities, and financial capacity. In developed countries, Natural Language Processing (NLP), machine learning, and generative AI have become integral to the automation of scholarly content creation and knowledge management. De Leon (2021) reported that university libraries in the United States adopted GPT based language models to generate abstracts, summarize scholarly

publications, and assist researchers in preparing research proposals and academic documents. Likewise, Gasparini and Kautonen (2022) found that European academic libraries employed conversational AI tools to generate metadata and descriptive records for institutional repositories, thereby improving resource discoverability and retrieval efficiency. Similarly, machine learning has enhanced metadata management and digital collection organization. Cox, Pinfield, and Rutter (2019) observed that libraries in the United Kingdom and Germany implemented machine learning algorithms to automate subject classification, keyword assignment, and metadata tagging, resulting in greater consistency, faster processing, and improved access to digital collections. Bashir et al. (2024) further reported that institutions such as the Massachusetts Institute of Technology integrated generative AI applications to create educational illustrations, research summaries, and visual learning materials, strengthening scholarly communication and interdisciplinary teaching. In developing countries, AI adoption has focused primarily on improving access and inclusivity. Springer Nature (2025) documented the use of AI powered translation tools at Can Tho University, Vietnam, to translate scholarly resources into local languages, thereby expanding access to international research. Similarly, Tsekea and Mandoga (2025) found that Zimbabwean academic libraries employed speech to text technologies to convert lectures and audio resources into searchable text, improving accessibility for users with hearing impairments. The literature demonstrates that AI technologies enhance the efficiency, quality, and accessibility of digital content creation in academic libraries. However, empirical evidence from African academic libraries, particularly in Nigeria, remains limited, highlighting the need for further investigation into AI enabled digital content creation within the region.

Emerging roles of librarians in an AI enabled digital content creation

Evidence from the reviewed literature indicates that AI automation is transforming the roles of librarians in academic libraries from traditional information managers to facilitators of AI enabled digital content creation, research support, digital scholarship, AI literacy, and the ethical use of artificial intelligence technologies. Research support has emerged as one of the most prominent roles, with librarians assisting researchers in selecting appropriate AI tools, evaluating AI generated content, supporting literature searching and synthesis, and promoting responsible research practices (Dhande, 2025; Adewojo et al., 2026). The literature also highlights librarians' expanding role as AI literacy educators, providing training on the effective and ethical use of generative AI tools for teaching, learning, and scholarly communication. In addition, AI has broadened librarians' responsibilities in digital resource management, data curation, and community engagement, while automation has enabled them to assume more strategic functions involving AI based data analysis, evidence based decision making, and information management (Nagare, 2025; Srirahayu et al., 2026). Another significant finding is the growing role of librarians as ethical advisors and policy advocates. The widespread use of generative AI has increased the need for guidance on copyright compliance, intellectual property, academic integrity, data privacy, and the detection of misinformation and AI generated inaccuracies. Consequently, librarians are increasingly supporting institutional AI governance and promoting responsible AI adoption (Dhande, 2025; Adewojo et al., 2026). The reviewed studies demonstrate that AI automation is redefining librarianship by expanding librarians' roles in digital scholarship, research support, AI literacy, digital resource management, data stewardship, ethical governance, and strategic decision making. However, the successful execution of these emerging

responsibilities depends on continuous professional development, institutional support, adequate digital infrastructure, and clear AI governance policies.

Competencies required for librarians to effectively utilize AI technologies

Empirical evidence indicates that the effective utilization of AI technologies in digital content creation depends on librarians possessing advanced digital, technical, and ethical competencies that extend beyond basic ICT skills. Studies consistently identify competencies such as information literacy, metadata management, AI applications, data analytics, machine learning awareness, digital resource management, cloud computing, cybersecurity, and critical thinking as essential for supporting AI enabled library services and digital scholarship. Oladokun and Umar (2025) found that librarians require competencies in information literacy, metadata management, digital content organization, and ethical decision making, although outdated LIS curricula, inadequate professional development, poor infrastructure, ethical concerns, and fear of job displacement hinder competence development. Similarly, Dube et al. (2025) emphasized the need for librarians to continuously strengthen their digital competencies to remain relevant in an increasingly technology driven environment. Akobe et al. (2026) highlighted the importance of continuous professional development, curriculum reforms, and reskilling initiatives to prepare librarians for AI powered innovations, digital preservation, and data driven library environments. Likewise, Obiano et al. (2026) reported that librarians require moderate to high competencies in online information retrieval, metadata creation, AI applications, data analytics, cybersecurity, cloud computing, and virtual reference services. Lawrence and Ejedafiru (2026) further stressed the need for institutional support and collaboration among universities, library schools, and professional associations to integrate AI related courses, practical training, and ethics into LIS education. Supporting these findings, Zhang and Liu (2025) argued that librarians must develop competencies in AI applications, data analysis, digital humanities, and critical thinking to effectively support digital scholarship and content creation. The literature demonstrates that successful AI enabled digital content creation requires continuous professional development, curriculum innovation, and institutional support. However, empirical evidence on the AI competencies of librarians in Nigerian academic libraries remains limited, highlighting the need for further investigation.

Ethical, legal, and professional issues associated with AI enabled digital content creation

AI enabled digital content creation presents significant ethical, legal, and professional challenges that extend beyond those associated with traditional artificial intelligence systems (Al Kfairy et al., 2024; Hagendorff, 2024; Surbakti, 2025). Earlier, Murugesan (2023) identified algorithmic bias, misuse and abuse of AI generators, security risks, and ethical concerns as major challenges associated with AI enabled content creation. More recent studies have expanded these concerns to include intellectual property disputes, authorship ambiguity, misinformation, accountability gaps, and inadequate governance. Existing copyright frameworks struggle to determine ownership of AI generated content, particularly where outputs are derived from copyrighted materials, while most academic publishers prohibit AI tools from being recognized as authors and instead require transparent disclosure of AI assistance (Wangmo, 2026; Yoo, 2025; Surbakti, 2025). AI detection tools also remain unreliable because they may incorrectly classify human written content as AI generated (Yoo, 2025). Bias and misinformation remain pervasive concerns. AI systems often inherit biases embedded in training data, resulting in unfair outcomes, stereotyping, and reduced diversity in generated content (Singh, 2024; Wang, 2025). Furthermore, the emergence of

deepfakes, hallucinated content, and large scale automated misinformation threatens public trust, journalistic integrity, and educational quality (Tabassum et al., 2025; Sonni et al., 2024; Yang, 2025). Accountability also remains problematic because the opaque nature of generative AI makes it difficult to determine responsibility for harmful or misleading outputs (Al Kfairy et al., 2024; Surbakti, 2025). Current governance frameworks remain fragmented and lack consistent international standards, empirical validation, and cross disciplinary coordination. Consequently, scholars advocate stronger regulatory frameworks, mandatory disclosure of AI generated content, watermarking technologies, improved explainability, enhanced security measures, and greater AI literacy to promote the responsible, transparent, and ethical use of AI in digital content creation (Al Kfairy et al., 2024; Wang, 2025; Surbakti, 2025).

Methodology

Research Design

This study adopted a Systematic Literature Review (SLR) design to synthesize empirical evidence on the application of AI technologies in digital content creation within academic libraries. A systematic literature review was considered appropriate because it enables the identification, critical appraisal, and synthesis of existing evidence in a transparent, rigorous, and reproducible manner while minimizing selection bias. The approach also facilitates the identification of research trends, knowledge gaps, and future research directions relating to AI enabled digital content creation in academic libraries.

Review Protocol

The review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta Analyses (PRISMA) 2020 guidelines. The PRISMA framework guided the processes of literature identification, screening, eligibility assessment, and study inclusion to ensure methodological transparency, consistency, and reproducibility throughout the review.

Data Sources

A comprehensive literature search was conducted between 10 June and 25 June 2026 using six major scholarly databases recognized for indexing high quality research in library and information science, education, and computer science. The final search was conducted on 25 June 2026**.** The databases searched were:

- Scopus
- Web of Science
- ERIC
- Library and Information Science Source (EBSCOhost)
- Google Scholar
- ScienceDirect

These databases were selected to ensure broad coverage of peer reviewed studies relating to AI technologies, digital content creation, librarianship, and higher education.

Search Strategy

The search strategy employed combinations of keywords and Boolean operators (AND, OR) to retrieve relevant literature. The principal search terms included:

- "Artificial Intelligence" OR "AI"
- "AI Automation"
- "Generative AI"

- "ChatGPT"
- "Academic Libraries"
- "Digital Content Creation"
- "Digital Scholarship"
- "Librarians"
- "Library Services"
- "Higher Education"

An example of the search string was:

("Artificial Intelligence" OR "Generative AI" OR "ChatGPT") AND ("Academic Libraries") AND ("Digital Content Creation" OR "Digital Scholarship") AND ("Librarians" OR "Library Services")

The search was limited to studies published between January 2018 and June 2026**.** Retrieved records were exported into Microsoft Excel for organization and management. Duplicate records were identified and removed before the screening process commenced.

Eligibility Criteria

Studies were selected using predefined inclusion and exclusion criteria to ensure that only relevant and methodologically sound evidence was synthesized.

Inclusion Criteria

Studies were included if they:

- were published in peer reviewed journals;
- were written in English;
- were published between 2018 and 2026;
- focused on academic libraries or higher education libraries;
- examined AI technologies in relation to digital content creation, digital scholarship, research support, or related library services; and
- reported empirical findings or systematic, scoping, narrative, or other evidence syntheses relevant to the review objectives.

Exclusion Criteria

Studies were excluded if they:

- were conference abstracts, editorials, commentaries, opinion papers, or book reviews;
- were duplicate records;
- were published in languages other than English;
- focused on non-library settings; or
- did not address AI technologies or digital content creation within academic libraries.

Study Selection and Screening

The study selection process followed the four stages recommended by the PRISMA 2020 framework.

- Identification: Relevant records were retrieved from the selected databases using the predefined search strategy.
- Screening: Duplicate records were removed, after which the titles and abstracts of the remaining studies were screened against the inclusion and exclusion criteria.
- Eligibility: The full texts of potentially relevant articles were retrieved and assessed to determine their eligibility for inclusion.

- Inclusion: Studies meeting all eligibility criteria were included in the final review and synthesized narratively.

The screening and eligibility assessment were conducted using the predefined criteria to ensure consistency throughout the review process. A PRISMA 2020 flow diagram was used to document the number of records identified, screened, excluded, and included at each stage of the review.

Data Extraction

A standardized data extraction form was developed to ensure consistency and accuracy during data collection. Information extracted from each eligible study included the author(s), publication year, country of study, study objective, research design, AI technology investigated, librarians' roles, competencies identified, ethical issues discussed, and the major findings relevant to the review objectives.

Table 1. Characteristics of the Included Studies

S/N	Author(s)	Year	Study Type	Main Theme
1	De Leon	2021	Empirical	AI for scholarly content generation
2	Gasparini & Kautonen	2022	Empirical	AI metadata generation
3	Cox, Pinfield & Rutter	2019	Empirical	Machine learning for metadata
4	Bashir et al.	2024	Empirical	Generative AI in academic libraries
5	Springer Nature	2025	Case study	AI translation services
6	Tsekea & Mandoga	2025	Empirical	Speech-to-text technologies
7	Dhande	2025	Empirical	Roles of librarians in AI
8	Nagare	2025	Empirical	Emerging librarian roles
9	Adewojo et al.	2026	Empirical	Generative AI and librarians
10	Srirahayu et al.	2026	Systematic Review	Information professionals in AI
11	Zhang & Liu	2025	Empirical	Role reinvention of librarians
12	Oladokun & Umar	2025	Systematic Review	AI competencies
13	Obiano et al.	2026	Empirical	Digital competencies
14	Akobe et al.	2026	Book chapter	Future competencies
15	Lawrence & Ejedafiru	2026	Empirical	AI competencies
16	Dube et al.	2024	Systematic Review	Digital competencies
17	Al-Kfairy et al.	2024	Review	Ethical challenges
18	Hagendorff	2024	Scoping Review	Ethics of Generative AI
19	Singh	2024	Empirical	AI in education
20	Sonni et al.	2024	Systematic Review	AI and journalism
21	Surbakti	2025	Systematic Review	Ethical challenges
22	Tabassum et al.	2025	Scoping Review	Legal and ethical issues
23	Wang	2025	Empirical	AI in media
24	Wangmo	2026	Legal analysis	Copyright and AI

S/N	Author(s)	Year	Study Type	Main Theme
25	Yoo	2025	Comparative Review	Editorial policies
26	Mada	2025	Empirical	ICT challenges
27	Haruna	2025	Empirical	Digital infrastructure
28	Idiegbeyan Ose & Idahosa	2025	Empirical	Digital technologies
29	Thinh	2026	Systematic Review	AI in academic libraries
30	Michalak	2023	Empirical	AI policy
31	Ali & Richardson	2025	Scoping Review	AI literacy policies
32	Miltenoff	2024	Empirical	AI literacy
33	Boateng	2025	Empirical	Generative AI services
34	Majumdar	2026	Review	Professional roles
35	Mahmud	2024	Empirical	AI cataloguing

Quality Assessment

The methodological quality of the included studies was evaluated using the Joanna Briggs Institute (JBI) Critical Appraisal Checklist**,** which is appropriate for assessing qualitative, quantitative, and mixed methods studies commonly included in systematic reviews. Each study was appraised against the relevant JBI criteria, including the appropriateness of the research design, sampling procedures, data collection methods, data analysis, validity and reliability of findings, and overall methodological rigor. Studies were classified as high, moderate, or low quality based on their appraisal scores. Only studies demonstrating acceptable methodological quality were retained for the final synthesis. All 35 included studies met the minimum quality threshold and were retained for the final synthesis.

Data Synthesis

The extracted data were analyzed using a narrative thematic synthesis approach. Findings from the included studies were organized into four major themes derived from the research questions:

1. AI technologies applied to digital content creation in academic libraries.
2. Emerging roles of librarians in AI enabled digital content creation.
3. Competencies required for librarians to effectively utilize AI technologies in digital content creation.
4. Ethical, legal, and professional issues associated with AI enabled digital content creation.

The thematic synthesis facilitated comparison of findings across different countries and institutional contexts, enabling the identification of recurring patterns, similarities, differences, emerging trends, and knowledge gaps. Particular attention was given to evidence from developing countries, especially Nigeria, to identify contextual challenges and opportunities for AI adoption in academic libraries.

Limitations of the Review

This review was limited to peer reviewed journal articles published in English between 2018 and 2026 and indexed in the selected databases. Consequently, relevant studies published in other languages, grey literature, dissertations, conference proceedings, and unpublished reports were excluded. Despite these limitations, the selected databases provided

comprehensive coverage of the available empirical literature on AI enabled digital content creation in academic libraries.

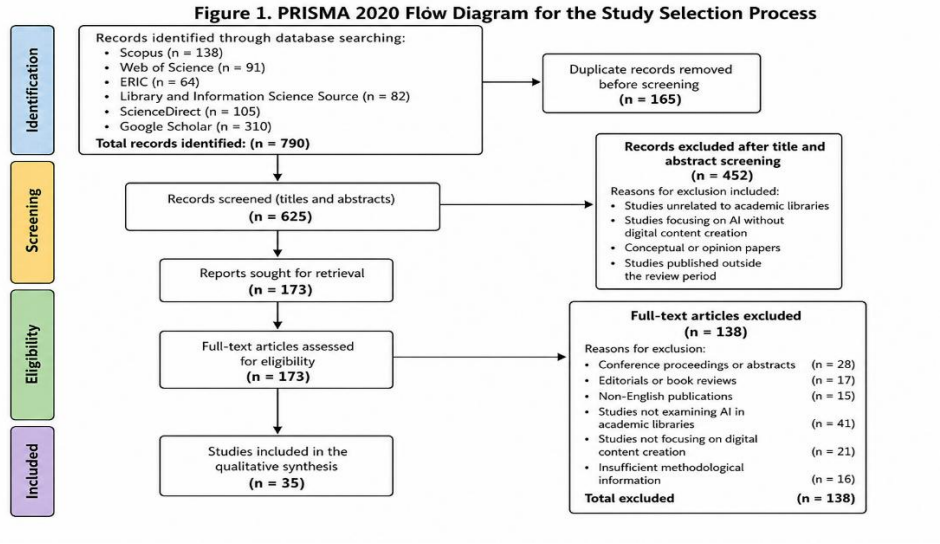


Figure 1: PRISMA 2020 Flow Diagram for the Study Selection Process

Figure 1 illustrates the PRISMA 2020 study selection process. A total of 790 records were identified through database searching. After removing 165 duplicate records, 625 records remained for title and abstract screening. Following the screening process, 173 full-text articles were assessed for eligibility. Of these, 138 articles were excluded based on the predefined eligibility criteria, resulting in 35 studies being included in the qualitative synthesis.

Identification

Records identified through database searching:

- Scopus (n = 138)
- Web of Science (n = 91)
- ERIC (n = 64)
- Library and Information Science Source (n = 82)
- ScienceDirect (n = 105)
- Google Scholar (n = 310)

Total records identified: n = 790
Duplicate records removed before screening: n = 165
Records screened (titles and abstracts): n = 625

Screening

Records excluded after title and abstract screening: n = 452
Reasons for exclusion included studies unrelated to academic libraries, studies focusing on AI without digital content creation, conceptual or opinion papers, duplicate publications that were not detected during the initial deduplication process, and studies published outside the review period.
Reports sought for retrieval: n = 173

Eligibility

Full-text articles assessed for eligibility: n = 173

Full-text articles excluded: n = 138
Reasons for exclusion:

- Conference proceedings or abstracts (n = 28)
- Editorials or book reviews (n = 17)
- Non-English publications (n = 15)
- Studies not examining AI in academic libraries (n = 41)
- Studies not focusing on digital content creation (n = 21)
- Insufficient methodological information (n = 16)

Included

Studies included in the qualitative synthesis: n = 35
The 35 eligible studies formed the basis for the thematic synthesis examining AI technologies applied to digital content creation, the emerging roles of librarians, the competencies required for AI-enabled library services, and the ethical, legal, and professional issues associated with AI-enabled digital content creation in academic libraries.

Results

The systematic review synthesized evidence from 35 studies published between 2019 and 2026 that examined the application of AI in digital content creation within academic libraries. The included studies comprised empirical studies, systematic reviews, scoping reviews, comparative reviews, legal analyses, and review articles conducted across developed and developing countries. The findings are presented under four themes corresponding to the research questions.

Theme 1: AI Technologies Used in Academic Libraries

The reviewed studies demonstrate that academic libraries are increasingly adopting AI technologies to enhance digital content creation and information services. The most frequently reported technologies include generative AI**,** NLP**,** machine learning**,** speech-to-text systems**,** AI-powered translation tools**,** automated metadata generation**,** and intelligent cataloguing systems**.** Generative AI applications such as GPT-based language models were widely used to generate research summaries, abstracts, instructional materials, library guides, and multimedia learning resources. Machine learning algorithms supported automated subject classification, metadata tagging, keyword assignment, and intelligent indexing, thereby improving the organization and retrieval of digital collections. NLP technologies facilitated semantic searching, conversational virtual assistants, automated reference services, and content summarization. AI-powered translation tools enhanced multilingual access to scholarly resources, while speech-to-text technologies improved accessibility for users with hearing impairments. Collectively, these technologies have increased efficiency, improved information discoverability, and enhanced research support services within academic libraries. Despite these advances, the review indicates that AI adoption remains considerably higher in developed countries than in developing countries because of differences in technological infrastructure, institutional investment, and digital readiness.

Theme 2: Emerging Roles of Librarians in AI-Enabled Digital Content Creation

The review reveals a significant transformation in librarians' professional responsibilities as AI technologies become integrated into academic library services. Rather than functioning solely as custodians of information resources, librarians increasingly serve as digital content creators, AI facilitators, research support specialists, digital scholarship consultants, AI literacy educators, data stewards, and institutional policy advisers. Many studies reported

that librarians now assist researchers in selecting appropriate AI tools, evaluating AI-generated content, conducting systematic literature searches, developing research guides, supporting institutional repositories, and creating digital learning resources. In addition, librarians play an important role in promoting responsible AI use by educating users about academic integrity, copyright compliance, misinformation detection, and ethical AI practices. The findings further indicate that librarians are becoming active participants in institutional AI governance through policy development, user education, advocacy, and strategic planning for responsible AI implementation.

Theme 3: Competencies Required for Effective AI Utilization

The reviewed studies consistently identified digital and technological competencies as essential prerequisites for successful AI implementation in academic libraries. Core competencies reported across the literature include AI literacy, information literacy, metadata management, digital content development, data analytics, machine learning awareness, cloud computing, cybersecurity, digital preservation, virtual reference services, and critical thinking. Beyond technical competencies, studies emphasized the importance of ethical reasoning, communication skills, problem-solving abilities, and continuous professional development. Many authors argued that existing Library and Information Science curricula require substantial revision to incorporate AI-related knowledge and practical training. The review also identified several barriers to competency development, including inadequate ICT infrastructure, limited funding, insufficient professional training opportunities, outdated curricula, and concerns about job displacement resulting from automation.

Theme 4: Ethical, Legal, and Professional Issues

Ethical and legal concerns emerged as one of the most prominent themes across the reviewed literature. The studies identified algorithmic bias, misinformation, hallucinated content, intellectual property disputes, copyright uncertainty, data privacy, cybersecurity risks, accountability challenges, and lack of transparency as major concerns associated with AI-enabled digital content creation. Several studies reported that existing copyright legislation has not adequately addressed ownership of AI-generated content, while the absence of universally accepted governance frameworks complicates accountability for AI-generated outputs. The literature also highlighted increasing concerns regarding deepfakes, plagiarism, fabricated information, and unreliable AI-detection tools. Most authors recommended strengthening institutional AI governance through comprehensive policies, mandatory disclosure of AI-assisted content, ethical guidelines, watermarking technologies, explainable AI systems, and continuous AI literacy education for librarians and library users.

Discussion

Identify research gaps and future directions This systematic literature review synthesized evidence from 35 studies published between 2019 and 2026 to examine the application of AI in digital content creation within academic libraries. Four major themes emerged from the review: AI technologies applied in academic libraries, the emerging roles of librarians, competencies required for AI enabled library services, and the ethical and legal issues associated with AI adoption.

The findings from research question 1 indicate that AI is fundamentally transforming academic librarianship by enhancing digital content creation, redefining librarians' professional responsibilities, and creating new competency and governance requirements.

The review identified generative AI, machine learning, natural language processing, automated metadata generation, speech to text technologies, and AI powered translation tools as the most widely adopted technologies supporting digital content creation. These findings are consistent with previous studies showing that AI has become a major driver of automation, metadata management, and digital scholarship in academic libraries. For example, De Leon (2021) found that GPT based language models enhance scholarly content generation, while Cox, Pinfield, and Rutter (2019) demonstrated that machine learning improves metadata creation and information retrieval. Collectively, these findings suggest that AI technologies have significantly improved the efficiency, discoverability, accessibility, and quality of digital content and library services. The review further indicates that academic libraries are evolving into intelligent digital knowledge environments that better support teaching, learning, research, and scholarly communication. However, substantial disparities in AI adoption persist between developed and developing countries due to differences in digital infrastructure, funding, technological readiness, workforce capacity, and institutional support, highlighting the need for greater investment in these areas, particularly in Nigeria.

The findings from research question 2 demonstrate that AI is fundamentally reshaping the professional roles of librarians in academic libraries. The reviewed studies consistently indicate that librarians are no longer confined to traditional responsibilities such as cataloguing and reference services but increasingly function as digital content creators, AI facilitators, research support specialists, AI literacy educators, digital scholarship consultants, and institutional policy advisers. This transformation reflects the growing integration of AI into library operations and scholarly communication. These findings are consistent with Dhande (2025), who reported that librarians increasingly support researchers by recommending appropriate AI tools, evaluating AI generated content, promoting responsible research practices, and providing guidance on the ethical use of generative AI. Similarly, Srirahayu et al. (2026) observed that AI has expanded librarians' responsibilities to include digital resource management, data curation, AI based decision making, and strategic information management. Collectively, these findings suggest that librarians' roles now extend beyond traditional information organization to encompass AI governance, user education, ethical guidance, research support, and institutional decision making, positioning librarians as strategic partners in research, innovation, and knowledge management.

The findings from research question 3 further demonstrate that successful AI implementation depends largely on librarians possessing appropriate digital and technological competencies. Information literacy, AI literacy, metadata management, digital content development, data analytics, cybersecurity, cloud computing, and critical thinking emerged as the most frequently identified competencies across the reviewed studies. These findings indicate that traditional Library and Information Science education alone is no longer sufficient to prepare librarians for AI enabled library environments. Instead, continuous professional development, curriculum reform, practical AI training, and interdisciplinary collaboration have become essential for sustaining professional competence and supporting digital scholarship. These findings are consistent with Dube et al. (2025), who emphasized that librarians must continuously strengthen their digital competencies to remain relevant in an increasingly technology driven environment. Similarly, Obiano et al. (2026) reported that librarians require competencies in online information retrieval, metadata creation, AI applications, data analytics, cybersecurity, cloud computing, and virtual reference services to effectively support AI enabled library services. Collectively, these findings underscore

the need for sustained institutional investment in staff development, curriculum innovation, and capacity building to equip librarians with the competencies required for the effective adoption and sustainable implementation of AI technologies in academic libraries.

The findings from research question 4 indicate that ethical, legal, and professional concerns emerged as another dominant theme throughout the review. Issues relating to algorithmic bias, misinformation, copyright ownership, intellectual property, data privacy, accountability, transparency, and AI generated content continue to present significant challenges for academic libraries. These findings are consistent with Al Kfairy et al. (2024), who reported that accountability, transparency, and governance remain critical concerns due to the opaque nature of generative AI and the absence of comprehensive regulatory frameworks. Similarly, Surbakti (2025) emphasized that responsible AI adoption requires stronger governance mechanisms, mandatory disclosure of AI generated content, enhanced AI literacy, and robust ethical guidelines. Collectively, these findings indicate that technological innovation must be accompanied by effective governance structures to ensure the responsible, transparent, and ethical use of AI in academic libraries. Consequently, academic libraries should strengthen institutional AI policies, promote AI literacy, provide copyright and intellectual property guidance, and establish clear ethical standards for AI generated content. Achieving responsible AI adoption also requires collaboration among librarians, university administrators, policymakers, software developers, and professional associations to develop sustainable governance frameworks that support the ethical integration of AI technologies into academic library services.

The review identified several best practices from developed countries that can inform AI implementation in developing nations. Successful institutions consistently demonstrated strong institutional leadership, reliable digital infrastructure, continuous staff development, interdisciplinary collaboration, and well established AI governance frameworks. These findings suggest that effective AI adoption extends beyond technological acquisition to include organizational readiness, strategic planning, and sustained investment in human and technological resources. The findings also have important theoretical implications by demonstrating that AI adoption represents more than technological innovation. Rather, it reflects a transformation of librarians' professional roles, organizational processes, and information service delivery. The review supports innovation adoption perspectives by showing that institutional readiness, organizational support, and librarians' competencies are critical factors influencing the successful integration of AI technologies in academic libraries.

Practical implications for academic libraries

From a practical perspective, the review highlights the urgent need for universities, library administrators, professional associations, and policymakers to strengthen AI capacity within academic libraries. Investment should focus on modern digital infrastructure, reliable internet connectivity, AI-focused professional development programmes, curriculum reform within Library and Information Science education, institutional AI governance frameworks, and the development of ethical guidelines for AI use. Such interventions will enable librarians to maximize the benefits of AI technologies while minimizing associated ethical and legal risks.

Research Gaps and Future Research Directions

Although the review provides a comprehensive synthesis of current evidence, several research gaps remain. There is limited empirical evidence from African academic libraries,

particularly within Nigeria, regarding AI-enabled digital content creation and librarians' preparedness for AI adoption. Most existing studies are descriptive and cross-sectional, providing limited understanding of long-term organizational change and the effectiveness of AI implementation strategies. Future research should therefore employ longitudinal, mixed-methods, and comparative designs to evaluate the impact of AI on library service quality, research productivity, digital scholarship, user satisfaction, and professional practice across different institutional contexts. Additional studies should also examine the effectiveness of AI governance frameworks, competency development programmes, and ethical guidelines in supporting sustainable AI adoption within academic libraries.

Conclusion and Recommendations

This systematic literature review synthesized empirical evidence from 35 studies published between 2019 and 2026 to examine the application of AI in digital content creation within academic libraries. The review demonstrates that AI is transforming academic librarianship through the adoption of technologies such as generative AI, machine learning, natural language processing, automated metadata generation, speech to text applications, and AI powered translation tools. These technologies have enhanced the efficiency, accessibility, discoverability, and quality of digital content while expanding librarians' roles from traditional information managers to research support specialists, digital scholarship facilitators, AI literacy educators, and ethical advisors. The review further reveals that successful AI implementation depends on librarians possessing advanced digital and technological competencies supported by continuous professional development, curriculum innovation, institutional leadership, and adequate digital infrastructure. At the same time, ethical and legal concerns relating to algorithmic bias, copyright, privacy, transparency, accountability, and misinformation remain significant challenges that require robust governance frameworks and responsible AI policies. Despite significant progress in developed countries, empirical evidence on AI adoption in African academic libraries, particularly Nigeria, remains limited. Academic libraries should therefore strengthen investment in digital infrastructure, AI focused professional development, and institutional governance frameworks to support responsible AI implementation. Library schools should integrate AI competencies into LIS curricula, while future research should employ longitudinal and comparative approaches to examine the long term impact of AI on library services, digital scholarship, and professional practice in developing countries.

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