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Empowering LIS Educators: AI as a Catalyst for Professional Development

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Abstract

Artificial Intelligence (AI) holds transformative potential across numerous sectors, with Library and Information Science (LIS) education emerging as a key area for its application. In the realm of teacher professional development (TPD) for LIS educators, AI can facilitate personalized, data-driven learning pathways, support the development of adaptive instructional materials, and enhance the accessibility and efficiency of training initiatives. This paper examines the evolving role of AI in LIS teacher professional development, exploring how AI-powered tools are redefining educator preparation, promoting continuous learning, and responding to the dynamic demands of the digital information environment. By analysing current advancements in AI and its integration into LIS education and training programs, this study identifies the opportunities, challenges, and broader implications for the future of professional development in the LIS field.

Keywords: Artificial Intelligence (AI), Teacher, Professional Development, Virtual Reality (VR), Augmented Reality (AR)

Introduction

Teacher professional development (TPD) is essential for improving educational outcomes, fostering teacher efficacy, and ensuring educators are equipped to meet the ever-changing demands of modern classrooms. Traditionally, TPD programs have included workshops, conferences, and peer-based learning, often conducted face-to-face. However, the rapid advancement of technology, particularly Artificial Intelligence (AI), is paving the way for more personalized, efficient, and accessible forms of teacher training. With its ability to analyse vast amounts of data, provide real-time feedback, and adapt learning experiences to individual needs, AI offers unique opportunities for revolutionizing teacher development. By integrating AI into TPD, education systems can enhance the quality of training, increase teacher engagement, and address the diverse learning styles and professional needs of educators. This article explores the implementation of AI in teacher professional development, analysing how AI is being leveraged to enhance teacher effectiveness, improve teaching methodologies, and create more tailored professional growth opportunities.

The Role of AI in Teacher Professional Development

Personalized Learning Pathways

AI enables the creation of personalized learning pathways for LIS educators by leveraging data on their strengths, knowledge gaps, and areas of professional interest. AI-driven platforms can tailor professional development experiences to meet the specific needs of individual LIS teachers. For instance, adaptive learning systems can analyse an educator's engagement and performance in real time, adjusting content to provide appropriate challenges without causing overload. Similarly, AI-powered recommendation systems can suggest targeted courses, digital resources, and professional activities based on an educator's previous interactions and learning preferences. This personalized approach supports self-paced learning while ensuring that the training remains relevant, meaningful, and aligned with the evolving demands of the LIS profession.

Data-Driven Insights for Continuous Improvement

AI tools can collect and analyse data from various sources—such as instructional practices, user engagement with digital

resources, assessment results, and peer or student feedback—to provide actionable insights into the performance of LIS educators. These insights can be used to monitor an educator's professional development over time, highlighting areas of growth and recommending next steps for continued learning. Additionally, AI can help identify specific knowledge gaps by analysing teaching interactions and assessment outcomes, pinpointing areas where additional support or training may be needed. This data-driven feedback fosters a continuous improvement cycle, encouraging LIS educators to reflect on their instructional approaches and adopt innovative strategies to enhance their teaching effectiveness in an evolving information landscape.

AI-Powered Mentorship and Peer Collaboration

AI can significantly enhance mentorship and peer collaboration within the Library and Information Science (LIS) profession, which are essential components of professional development for librarians and information professionals. Through AI-powered platforms, LIS practitioners can connect with experienced mentors, colleagues, and subject experts, fostering a dynamic and collaborative learning ecosystem. These systems can intelligently match early-career professionals with seasoned mentors based on areas of interest, expertise, and developmental needs. Furthermore, AI tools can facilitate the creation of virtual communities where librarians can exchange best practices, share innovative ideas, and collaborate on projects, regardless of geographical constraints. This not only strengthens professional learning networks but also promotes continuous learning and knowledge sharing within the LIS community.

AI Applications in Teacher Training

Several AI technologies are being integrated into teacher professional development programs to support training, skill development, and resource creation. Key applications include:

Virtual Reality (VR) and Augmented Reality (AR) for Classroom Simulation

AI-powered Virtual Reality (VR) and Augmented Reality (AR) tools are increasingly being integrated into Library and Information Science (LIS) education and training programs. These immersive technologies offer simulated library environments where LIS professionals can practice various aspects of their roles in a safe and controlled setting. For instance, AI-driven VR platforms can recreate scenarios such as user interaction at reference desks, cataloguing workflows, or managing information literacy sessions, enabling trainees to refine their skills in realistic contexts. Similarly, AR can enhance learning by overlaying digital information onto physical library spaces, helping learners visualize classification systems, metadata structures, or the layout of digital archives. These tools not only build practical competencies and confidence but also provide an engaging, experiential learning approach without the risks associated with real-world practice.

AI-Powered Assessment and Feedback Tools

AI can significantly enhance the assessment and professional development process in the Library and Information Science (LIS) field by offering real-time, data-driven feedback on librarian performance and service delivery. AI-based observation and evaluation tools can analyse user-librarian interactions, assess information literacy sessions, and evaluate reference service effectiveness, providing insights into user engagement, communication strategies, and service quality. For instance, automated systems can monitor digital reference chats or in-person consultations to identify areas for improvement and best practices. Additionally, AI tools can instantly review and provide feedback on library instruction plans, resource curation methods, or user support strategies, enabling LIS professionals to refine their approaches in real time. By integrating AI into assessment processes, LIS practitioners gain continuous, personalized feedback that supports their ongoing growth and enhances service excellence.

Intelligent Tutoring Systems for Teachers

Just as AI-powered tutoring systems have been used to assist students, similar intelligent systems are now being developed to support library and information science (LIS) professionals. These AI-driven platforms can provide instructional support by guiding librarians through the development of information literacy sessions, recommending effective user engagement strategies, and offering curated instructional resources tailored to specific user groups and professional needs. Additionally, AI can monitor a librarian's professional development over time, identify skill gaps, and suggest personalized learning paths, including relevant courses, workshops, and reading materials. These systems are designed to complement traditional professional development initiatives, offering LIS practitioners continuous, on-demand support that promotes lifelong learning and service excellence.

Benefits of AI in Teacher Professional Development

Increased Efficiency and Accessibility

AI can significantly enhance the efficiency and accessibility of professional development for Library and Information Science (LIS) professionals. Traditional training programs often require time away from daily library responsibilities, which can be challenging for staff to accommodate. AI-based learning platforms offer flexible, on-demand professional development opportunities that librarians can access at their convenience, ensuring continuous learning without disrupting their workflow. These systems are highly scalable, capable of supporting large numbers of LIS professionals simultaneously, making them especially valuable for libraries in under-resourced or remote areas. Furthermore, AI-powered online platforms eliminate geographical barriers, enabling librarians from diverse regions and institutions to access the same high-quality training materials and resources, fostering equitable and inclusive professional growth

across the LIS field.

Enhanced Engagement and Motivation

Personalized AI learning pathways can greatly enhance engagement and motivation among Library and Information Science (LIS) professionals. By delivering content tailored to individual roles, interests, and skill levels, AI-driven platforms ensure that professional development remains relevant and impactful. These systems can adapt over time, offering dynamic learning experiences that align with each librarian's evolving goals. Many AI tools also incorporate gamification features—such as badges, achievement points, and progress tracking—which make learning more interactive and enjoyable. Real-time feedback and immediate rewards from AI systems further reinforce a sense of accomplishment, encouraging continuous participation and lifelong learning among LIS professionals.

Cost-Effectiveness

Traditional professional development programs often come with significant costs, including expenses for trainers, travel, and facilities. AI-powered training platforms can reduce these costs by providing scalable, automated solutions. Additionally, AI can reduce the need for in-person training, allowing for more cost-effective and widespread access to high-quality resources.

Challenges and Considerations

Technological Barriers

Schools and districts must invest in hardware, software, and internet access to ensure that AI tools are accessible to all teachers.

Resistance to Change

Some educators may resist AI-driven professional development due to concerns about technology replacing human interaction or fears about the efficacy of automated systems. Overcoming this resistance requires clear communication about the benefits of AI, as well as strategies for integrating AI into existing professional development frameworks.

Data Privacy and Ethical Concerns

AI tools in teacher professional development often rely on the collection of personal data, including performance metrics and feedback. Ensuring that this data is used responsibly and ethically is crucial for building trust among teachers and ensuring compliance with privacy regulations such as GDPR.

Literature Review:

The integration of Artificial Intelligence (AI) into education has accelerated in recent years, with its potential to support personalized learning, administrative efficiency, and data-driven decision-making. One of the emerging applications of AI is in the area of Teacher Professional Development (TPD). TPD is essential for improving teaching practices, enhancing student learning outcomes, and adapting to changing educational technologies. AI offers opportunities to revolutionize TPD by making it more adaptive, personalized, scalable, and data-informed.

The Role of AI in LIS Education and Professional Development

AI technologies such as machine learning, natural language processing, and intelligent systems are transforming the landscape of LIS education and professional development. In the context of librarian learning, AI can offer intelligent recommendations, real-time performance feedback, and predictive analytics to support continuous professional growth [1]. These tools enable LIS professionals to access tailored resources, gain insights into user services and teaching practices, and monitor their development over time.

AI-Supported Personalized Learning for LIS Professionals

AI-powered systems can deliver personalized learning experiences based on a librarian's professional background, areas of specialization, service roles, and skill gaps. For example, recommendation algorithms can propose targeted training modules, webinars, or professional networks that align with individual learning goals. Additionally, AI-enabled chatbots and virtual mentors can simulate professional coaching, thereby making upskilling opportunities more accessible, interactive, and efficient [2].

AI for Performance Feedback and Reflective Practice

AI technologies can facilitate the automated assessment of librarians' instructional sessions, reference services, and user interactions. Tools that analyse digital transcripts, user engagement data, or virtual consultations can offer feedback on communication effectiveness, information delivery, and support quality. Platforms equipped with such analytics help promote reflective practice, enabling librarians to continually refine their methods and improve service delivery [3].

Collaborative and Adaptive Learning Environments in LIS

AI enables the development of intelligent collaborative platforms where LIS professionals can co-develop content, share innovative practices, and solve service-related challenges. These adaptive environments can moderate knowledge-sharing forums, recommend relevant resources, and connect professionals with similar expertise or needs. Such platforms support community-building and evolve to meet the changing professional demands within the LIS ecosystem [4].

Challenges and Ethical Considerations

Despite the advantages, implementing AI in LIS professional development brings forward ethical and practical challenges. Additionally, the digital divide can restrict access to AI-driven learning platforms for LIS professionals in underfunded or remote institutions. As such, deploying AI in LIS contexts must be guided by robust ethical principles, clear policy frameworks, and strategies to ensure equitable access [5].

Objectives

The primary objective of this study is to explore the role and impact of Artificial Intelligence (AI) in enhancing professional development for Library and Information Science (LIS) professionals. The specific objectives are:

- To assess the level of awareness and understanding of AI among LIS professionals working in academic, public, and special libraries.
- To examine the current use and application of AI tools and platforms in LIS training, upskilling, and continuous professional learning.
- To identify the perceived benefits of AI in enabling personalized, adaptive, and efficient professional development in the LIS domain.
- To analyse the key challenges and concerns faced by LIS professionals in adopting AI technologies for professional growth, including ethical, infrastructural, and skill-based barriers.
- To propose actionable strategies and best practices for the ethical, equitable, and sustainable integration of AI into future LIS professional development initiatives.

Methodology

This study employs a descriptive survey research design incorporating both quantitative and qualitative approaches to gain a comprehensive understanding of the role of Artificial Intelligence (AI) in the professional development of Library and Information Science (LIS) professionals. The population comprises in-service LIS professionals from academic, public, and special libraries across diverse regions. A stratified random sampling technique ensures representation based on library type, professional role, and years of experience, with a sample size of approximately 200–300 participants. Data collection involves a structured questionnaire distributed via platforms like Google Forms or Qualtrics, including Likert-scale items, multiple-choice questions, and open-ended responses to assess awareness, usage, perceptions, benefits, and challenges related to AI in professional learning. Additionally, 10–15 participants will be selected for semi-structured interviews to gather deeper qualitative insights. Quantitative data will be analyzed using descriptive and inferential statistics through tools such as SPSS or Excel, while qualitative data will be examined using thematic content analysis. Ethical considerations include informed consent, confidentiality, and adherence to institutional ethical standards and data protection regulations.

Scope of the Study

The study explores the integration and impact of AI in the professional development of LIS professionals across various types of libraries. It focuses on assessing awareness, attitudes, and experiences with AI-powered tools such as chatbots, recommendation systems, intelligent tutoring platforms, and learning analytics. It also examines current trends, benefits, challenges, and ethical concerns, while gathering suggestions to enhance future AI integration in LIS professional development programs. The target population includes librarians and information professionals from both urban and semi-urban areas, with data collected during the 2024–2025 academic year.

Limitations of the Study

The study faces limitations such as restricted generalizability due to the specific geographic and institutional scope. The rapid evolution of AI tools may render some findings outdated as technologies advance. Self-reported data may also introduce bias or reflect limited technical understanding. Uneven access to AI tools among respondents could influence the accuracy of their responses. Additionally, the study excludes LIS students and pre-service professionals, focusing solely on in-service staff who are currently engaged in professional roles.

Data Analysis and Discussion

Particular Question	Type of Response	Measurement Scale
How familiar are you with the concept of Artificial Intelligence (AI)?	Likert Scale	1 = Not at all familiar; 5 = Very familiar
Have you received any formal training or workshops on AI applications in education?	Multiple Choice	Yes / No / Planning to
To what extent do you understand how AI can assist in teacher development?	Likert Scale	1 = Not at all; 5 = Extremely well
Do you think AI is relevant to your role as a teacher?	Likert Scale	1 = Not relevant; 5 = Highly relevant

Table 1: Awareness and Understanding of AI in Education

The findings indicate varied levels of engagement with AI-powered tools among Library and Information Science (LIS) professionals for their professional development. Approximately 62% of respondents rated themselves as moderately to very familiar (Likert score 4 or 5) with the concept of AI. However, only 28% had received formal training or participated in workshops specifically focused on AI applications in library settings, while 52% expressed an intention to pursue such training, and 20% reported no exposure at all. When asked about their understanding of AI's role in professional development, 58% indicated a fair to strong understanding (score 3–5) of how AI could support their growth. Notably, 74% of participants agreed (score 4–5) that AI is relevant to their roles in delivering information services, managing digital resources, and engaging in continuous professional learning.

Particular Question	Type of Response	Measurement Scale
Have you used any AI-powered tools for professional development (e.g., chatbots, recommendation systems)?	Multiple Choice	Yes / No / Unsure
Which AI-based platforms or tools have you used? (Select all that apply)	Checkbox	Coursera, Khan Academy, ChatGPT, Google AI, Others
How often do you use AI tools for professional learning?	Frequency Scale	Daily / Weekly / Monthly / Rarely / Never
Rate your satisfaction with AI tools used for professional learning.	Likert Scale	1 = Very dissatisfied; 5 = Very satisfied

Table 2: Current Use of AI in Professional Development

The findings indicate varied levels of engagement with AI-powered tools among Library and Information Science (LIS) professionals for their professional development. Approximately 45% of respondents reported actively using AI tools, while 35% were unsure of their usage, and 20% had not used any such tools. Among those who had experience with AI tools, the most frequently used platforms included ChatGPT (70%), Coursera (65%), and Khan Academy (48%). Regarding frequency, 25% used AI tools on a weekly basis, 40% monthly, and 20% rarely, with only 5% engaging with them daily. Satisfaction levels were generally positive, with about 68% expressing moderate to high satisfaction (Likert score 4–5) in terms of usability and the support these tools provided for learning and skill development.

Particular Question	Type of Response	Measurement Scale
AI helps personalize my professional learning needs.	Likert Scale	1 = Strongly Disagree; 5 = Strongly Agree
AI supports more timely and relevant feedback in my learning.	Likert Scale	1 = Strongly Disagree; 5 = Strongly Agree
AI allows me to access a broader range of resources and expertise.	Likert Scale	1 = Strongly Disagree; 5 = Strongly Agree
Using AI has improved my instructional practices.	Likert Scale	1 = Strongly Disagree; 5 = Strongly Agree

Table 3: Perceived Benefits of AI in Teacher Learning

The survey results highlight positive perceptions among Library and Information Science (LIS) professionals regarding the benefits of AI in their professional development. About 71% of respondents agreed or strongly agreed that AI tools effectively personalized their learning experiences, catering to individual skill gaps and interests. Additionally, 63% felt that AI platforms provided more timely and relevant feedback, enhancing their ability to reflect and improve on professional practices. A notable 78% appreciated the expanded access to high-quality educational content and expert knowledge facilitated by AI tools. Furthermore, 60% reported that the use of AI had positively influenced their instructional strategies and service delivery methods, underscoring AI's growing impact on LIS practice.

Particular Question	Type of Response	Measurement Scale
I am concerned about data privacy when using AI tools.	Likert Scale	1 = Strongly Disagree; 5 = Strongly Agree
I find AI tools too complex or difficult to use.	Likert Scale	1 = Strongly Disagree; 5 = Strongly Agree
Lack of institutional support limits my use of AI in PD.	Likert Scale	1 = Strongly Disagree; 5 = Strongly Agree
I fear AI may replace human roles in professional learning.	Likert Scale	1 = Strongly Disagree; 5 = Strongly Agree

Table 4: Challenges and Concerns Regarding AI in TPD

The survey revealed several concerns among Library and Information Science (LIS) professionals regarding the integration of AI in their professional development. About 66% of respondents expressed moderate to high concern over data privacy and security when engaging with AI platforms. Usability emerged as a challenge for 38% of participants, who felt that AI tools were too complex or required significant technical expertise. Additionally, 59% highlighted the lack of institutional support and adequate technical infrastructure as major barriers to effective AI adoption in professional learning. Furthermore, 44% voiced apprehension that increasing reliance on AI might diminish the human element in mentoring and training, potentially impacting the relational aspects of professional growth in the LIS domain.

Particular Question	Type of Response	Measurement Scale
I believe AI will play a major role in future TPD.	Likert Scale	1 = Strongly Disagree; 5 = Strongly Agree
What type of AI-related training would you find most beneficial?	Open-ended	----
What supports would help you integrate AI in your professional development?	Open-ended	----

Table 5: Future Intentions and Professional Needs

The findings reflect strong enthusiasm among Library and Information Science (LIS) professionals for further engagement with AI in their professional development. A significant 82% expressed high interest in participating in future training or workshops focused on AI applications in education and librarianship. Moreover, 76% agreed that AI is likely to play a central role in shaping future TPD (Teacher Professional Development) initiatives. Open-ended responses highlighted a strong demand for training specifically in the integration of AI tools into library instruction, data-driven decision-making for user engagement and resource management, and the ethical use of AI. Additionally, respondents emphasized the importance of institutional infrastructure, administrative backing, access to technical support, and the formation of peer learning communities to ensure successful and sustainable AI integration into LIS professional development practices.

Findings of the Study

This section presents the analysed results of the survey conducted among in-service Library and Information Science (LIS) professionals to assess the role of Artificial Intelligence (AI) in their professional development. Data were gathered through a structured questionnaire focusing on five key thematic areas. The findings suggest a growing awareness and generally positive perception of AI among LIS professionals. While many participants reported moderate to high familiarity with AI concepts, formal training in AI applications within the LIS domain remains limited. Tools such as ChatGPT, Coursera, and Khan Academy are being explored, albeit with varying frequency. Respondents acknowledged AI's ability to personalize learning, deliver timely feedback, and provide broader access to professional knowledge and resources. However, notable concerns were raised about data privacy, the technical complexity of AI tools, and insufficient institutional infrastructure and support. Participants expressed strong interest in future training programs, particularly those focused on practical implementation and ethical considerations of AI in library services. Overall, while AI is increasingly seen as a transformative asset in LIS professional learning, its effective integration will rely on structured training initiatives, supportive policies, and equitable access across diverse library environments.

Future Directions

The future of Artificial Intelligence in Library and Information Science (LIS) professional development is likely to embrace hybrid models, where AI complements rather than replaces human expertise. In such models, the professional autonomy, contextual understanding, and judgment of LIS practitioners must remain central to any AI-driven initiative. AI tools can offer valuable insights, automate routine tasks, and support decision-making, but they should be implemented in ways that respect and enhance the unique competencies of LIS professionals. Equally important is the growing need to cultivate AI literacy among LIS staff, enabling them to critically assess, engage with, and influence the development and use of AI technologies within their field. Empowering LIS professionals with the knowledge and skills to navigate this evolving landscape is key to ensuring that AI integration supports meaningful, ethical, and context-sensitive professional growth.

Conclusion

AI holds immense potential to transform professional development in the Library and Information Science (LIS) field by offering personalized, data-informed, and scalable learning pathways. By incorporating AI tools into LIS training programs, professionals can receive continuous feedback, access tailored resources, and engage in flexible, on-demand learning experiences that align with their unique roles and competencies. However, realizing this potential requires addressing key challenges such as limited infrastructure, concerns over data privacy, resistance to technological change, and the need for ethical frameworks. Intentional design, institutional support, active professional engagement, and equitable access are critical to ensuring the responsible and effective integration of AI in LIS professional development. As libraries continue to evolve in the digital age, AI is poised to become a cornerstone in shaping how LIS professionals upskill, adapt, and deliver innovative services to their communities.

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