AI Literacy in Higher Education: Strategies and Challenges for Information Science Professionals

Tippanu Jagannadham[1], Harihararao Mojjada[2]

[1]Librarian Avanthi Institute of Engineering and Technology (A) Tagarapuvalasa Andhra Pradesh, India

[2]Assistant Librarian MVGR College of Engineering (A) Vizianagaram-535005 Andhra Pradesh, India

DOI: https://doi.org/10.47772/IJRISS.2026.10200123

Received: 11 February 2026; Accepted: 17 February 2026; Published: 26 February 2026

ABSTRACT

The impact of Artificial Intelligence (AI) in higher education is revolutionizing the educational landscape, especially in Library and Information Science (LIS). As technologies such as automation, information retrieval, and research support reshape the makeup of academic libraries, AI literacy has truly become an essential competency for information science practitioners. This paper explores that the drawing on literature and scholarship about the value of AI literacy in higher education, specific details in roles augmenting library services and enhancing user experiences, how to develop AI capabilities, including curriculum, training, ethical issues. The research results are complemented by efforts to address previous concerns regarding algorithmic bias, data privacy, and the resistance of AI adoption. Through a study of best practices and implementation frameworks, this paper seeks to offer a broad comprehension of AI literacy to support LIS professionals as they prepare to navigate the emerging digital landscape.

Keywords: Information Literacy, Higher Education, AI Literacy, Artificial Intelligence, Academic Libraries.

INTRODUCTION

Artificial Intelligence (AI) is redesigning higher education, influencing teaching, research, and information management including resources. As AI-driven tools and systems become essential to academic environments, AI literacy has arisen as a crucial competency for educators, students, and information professionals such as librarians, documentation offices, and information scientists. AI literacy embraces the ability to understand, evaluate, and responsibly apply AI technologies in various educational, research and development contexts. Particularly in academic libraries AI literacy is necessity to integrating AI for information retrieval, user services, and decision-making processes. However, the implementation of challenges of AI like including ethical considerations, data privacy, and algorithmic bias is a big assignment for the information professionals in the present generation. This paper explores the significance of AI literacy in higher education, examining its impact on academic libraries and outlining strategies to equip information professionals with the skills necessary to navigate an AI-driven academic landscape effectively.

Defining AI Literacy

AI literacy denotes to the essential knowledge, skills, and competencies needed to understand, evaluate, and responsibly smear of AI technologies. In higher education, it enables educators, students, and information professionals to influence AI tools effectively while discussing the ethical concerns, data privacy, and algorithmic bias in academic and research environments. The AI literacy concept includes:

Basic understanding of AI principles and applications:

It is a data-driven, knowledge-based computational technology, such as machine learning, natural language processing, and computer vision, which enables computers to replicate or simulate human intelligence. Proficient knowledge of AI initiates with a few rudimentary concepts like supervised and unsupervised learning, neural networks, and algorithmic decision-making. AI applications are already widely integrated into

research, academic libraries and administrative processes in higher education, enhancing information retrieval, data analysis and personalized learning experiences. Innovative academic environments, on the other hand, have proven to greatly benefit from AI-driven tools (and most notably chatbots, recommendation systems and automated indexing). But information professionals must build AI literacy herself to develop responsible usage as well as to mitigate ethical risks and optimize integration of this technology within higher education institutions.

Critical evaluation of AI-generated content:

The rise of AI-generated content in academic and professional spheres requires careful, critical scrutiny to establish correctness, dependability, and moral transparency. So, AI-generated text generation tools, like natural language processing models can create large amounts of information, but most of the time they are devoid of contextual means; factual precision; and subtle reasoning. As information professionals and scholars, we need to evaluate AI-generated content by verifying sources, cross-referencing data and spotting possible biases built in AI algorithms. Moreover, ethical challenges, including the issue of transparency in AI supported research and detection of misinformation, are critical. As AI continues to populate the ease of information access, such literacy skills allow for genuine outputs of AI to be critically evaluated by the users to know how to responsibly incorporate them into academic communities and as part of academic integrity, and to avoid the potential for misinformation as privacy is suspended.

Ethical considerations in AI usage:

Algorithms and AI are playing a larger role in higher education, presenting critical ethical challenges, like algorithmic bias, privacy of data and transparency. When AI is involved in the decision-making process, it can reflect the various biases present in our society, and what information someone has access to may be determined by playing into the biases of AI. To guarantee ethical application via AI policies, through accountability and on-going evaluation that balances risks with equity, inclusion, and ensures responsible widely deployed, AI in both educational and research settings.

AI-driven information retrieval and recommendation systems:

Using advanced machine-learning algorithms and natural language processing techniques, AI-enabled information retrieval and recommendation systems improve the accuracy and efficiency of academic research. Such systems customize search results, enhance data listing, and accelerate content retrieval in digital repositories. But they also raise ethical considerations in the context of the higher education institution they are implemented. Positive potential aside, challenges like algorithmic biases, and issues such as data privacy, must be taken into account when considering their implementation in higher education institutions.

AI in Higher Education and Academic Libraries

Consequentially, AI applications in higher education are transforming the breadth of teaching, learning, and research, from automated research assistance to personalized learning at scale to intelligent data analytics. These technologies improve information retrieval, personalize educational content, and aid in data-driven decision-making. In academic institutions, their synergy boosts efficiency, encourages innovation, and serves as a catalyst for transforming the role of educators and information professionals.

Academic libraries leverage AI in:

Information retrieval systems:

In recent years, there has been growing use of Artificial Intelligence (AI) by academic libraries to improve information retrieval systems so search efficiency and user experience could be boosted. AI-powered algorithms can also pull from machine learning and natural language processing to optimize search queries, return the most relevant resources, and surface personalized recommendations, such systems streamline metadata indexing, automate the categorization of resources and facilitates predictive analytics for collection development. AI-powered chatbots and virtual assistants add another layer of user engagement by delivering research support in real-time. Nevertheless, there are ethical issues, but data privacy & algorithmic bias should

be tackled to ensure equitable access to information. The impact of AI for libraries as a service is a major hurdle for the future of knowledge discovery and academic research.

Chatbots and virtual assistants:

Academic libraries are adopting AI based chatbots and virtual assistants in various user services and information seeking. These systems are known as generatively trained-deliver contextual, real time responses to questions, facilitate exploration of libraries and research content within library environments, and in common use behind the scenes conduct catalogue searches and make resource recommendations, etc. AI powered assistants leverage natural language processing and machine learning to enhance user engagement and efficiency. Nevertheless, ethical and effective implementation of generative AI in academic library environments can only be ensured by addressing challenges such as data privacy, user trust, and algorithmic limitations.

Predictive analytics for collection development:

There is an increasing trend of use of AI based predictive analytics tools in academic libraries for making their collection development more focused. AI endeavours librarians to make data-governed selection decisions that align resources with changing academic requirements by analysing systems patterns, citation movements, and user propensities. Predictive models assist in optimizing budget allocations, filling collection gaps, and anticipating research needs in the future. Nonetheless, ethical challenges such as algorithmic bias and data privacy need to be overcome to provide equitable access and accuracy in AI-driven decision-making in academic libraries.

AI-based plagiarism detection and research integrity tools:

AI also is being adopted by academic libraries to bolster research integrity, employing advanced plagiarism detection and verification software. AI systems scour databases looking for matches and identifying potential academic crime with greater accuracy than ever before. Such mechanisms assist academics in preserving originality, navigating self-plagiarism, and engaging in ethical research practices. AI also improves citation analysis, authorship verification, and data authenticity verification. The integration of AI-based plagiarism detection enables academic libraries to contribute to the preservation of scholarly integrity as well as the promotion of trust in academic publishing and research practices.

Need of the study:

AI literacy for information science professionals will help them understand AI applications and use them effectively in library services. As AI increasingly makes its way into academic institutions, practitioners will need to acquire the necessary skills to harness AI systems for better information discovery and more effective customer engagement. Fostering AI literacy which is essential in higher education settings as AI underpins digital transformation, optimizes workflows, and modernizes library operations- will therefore drive significant opportunities and help influence practice in the future.

Ethics in AI and fairness, and the need for demonstrable transparency and accountability in decision-making systems with AI elements This practice, by enhancing AI literacy, not only allows information professionals to implement ethical AI practices but also mitigate risks associated with bias and data privacy and ensure their responsible application. As a result, AI improves decision-making by using data analysis, allowing academic institutions to adopt more effective and data-driven policies.

Scope of the study: This study reviews the literature on AI adoption in academic libraries with a lens on strategies for building AI competencies and the implications of AI-supported knowledge organization and dissemination. It examines the: ways in which AI technologies may enrich digital collections; reduce frictions in research support; and, support the broader goals of our academic employers. By identifying best practices and challenges, this study seeks to provide insights into AI integration and its significance for the future role of information science practitioners.

Objectives of the Study:

This paper aims to:

Define AI literacy and its relevance to higher education.

Study the integration of AI technologies in academic libraries.

Identify strategies for developing AI literacy among information professionals.

Explore best practices for leveraging AI in LIS education and practice.

Discuss challenges and limitations associated with AI literacy in higher education.

Advantages of AI Literacy in Higher Education

- Enhances digital competencies of information professionals.
- Facilitates efficient management of big data and digital resources.
- Improves personalized learning experiences through AI-driven recommendations.
- Automates repetitive library tasks, enabling professionals to focus on high-value services.
- Supports research and academic publishing through AI-powered data analytics.

Limitations of AI Literacy in Higher Education

- Lack of AI-related training and education programs for LIS professionals.
- Ethical and privacy concerns in AI applications.
- High costs associated with AI implementation in academic libraries.
- Resistance to technological changes among information professionals.
- Limited availability of AI literacy frameworks specific to LIS education.

REVIEW OF LITERATURE

The integration of Artificial Intelligence (AI) in higher education has provoked wide-ranging research into AI literacy among information science professionals. The thematic review synthesizes findings from recent studies, highlighting key strategies and practices:

Keen (2023) stresses the need for AI literacy in postsecondary education and suggests new approaches to develop forward-thinking AI instruction in a higher education setting. Keys to success in AI education, as determined by the study, include: supporting the development of All AI program competencies for students and faculty in each academic discipline-with institution backing for this process; fostering interdisciplinary collaboration among students and faculty; and fostering a community of practice in AI education through peerled roundtable discussions to help share and disseminate useful strategies. Following up on the benefits of AI tools for higher education, a study by ***Reham Salhab (2023)*** examines college instructors' views about the introduction of AI literacy into curriculum design. The results suggest that while educators see the necessity of AI literacy, they struggle with limited resources and institutional support. It suggests professional development and collaborative curriculum planning are ways to break down the walls of resistance. ***Laupichler et al. (2022)*** examining AI literacy in higher and adult education, mentions that the field would benefit from standardized AI literacy frameworks that help design educational programs based on the context, which can help enhance the AI competencies of learners. ***Hazari (2024)*** make a strong case for embedding AI literacy courses in higher education. This article highlights the ethical issues and bias surrounding AI technologies and provides a conceptual guideline comprising awareness, skill development and practical application of knowledge to equip the students with responsible usage of AI technology. **Dana-Kristin Mah& Nele Katharina Groß (2023)** Investigating faculty members' self-efficacy and professional development needs for a successful AI integration in higher education. Each profile has a different level and type of AI use and the study recommends tailored

training programs to promote AI literacy and meaningful integration in teaching. ***Subaveerapandiyan et al.*** These articles published from 2020–2023 include a scale for AI literacy [2020]; ***LIS researchers' AI literacy in ASEAN countries [2023],*** and the impact of AI on the library community [2020]. The study identifies areas of weakness in AI knowledge and suggests implementing specialized training programs tailored to help bridge those gaps and increase researchers' competencies, thus ultimately improving the overall quality of AI studies across the region. ***Brenda Van Wyk (2024)*** explores AI literacy in higher education in the Global South, from philosophical to practical education perspectives. This can be particularly observed through the review's findings about the necessity for culturally relevant AI education frameworks as well as the requirement for ethical considerations that are unique to these localized contexts. Teaching and Learning Centers Play Pivotal Role in Providing AI Literacy to Students, Faculty & Staff by ***Zoe Gavriilidou(2023)*** Through workshops, developing resources, and collaborative efforts the paper identifies strategies to help guide the implementation of effective integration of AI within higher education. ***Ari Alamäki et. Al (2023):*** AI literacy and sustainable development: A learning experiment. The findings indicate that students have limited fundamental knowledge in both AI and sustainability, and thus, there is a need to integrate courses in both areas to equip students to address emerging challenges***. Faruqe et al. (2021)*** present a model of AI literacy competencies that bridges the gap between the theoretical and the pragmatic. Data were collected up to October 2023, and the study highlights the significance of competency evaluations and well-structured learning trajectories to prepare individuals with the skills required to engage with AI technologies competently. ***Surjadi (2024)*** describes how colleges are rushing to integrate AI into their curricula in response to growing employer demand and student interest. At the same time, the article exemplifies specialised AI degrees, institutionalised compulsory AI courses, and interdisciplinary applications, emphasising the immediacy of AI literacy in higher education. Laupichler et al. In the field of higher and adult education, AI-related literacy was analyzed with a scoping review by ***Giannakos et al. (2022).*** The review suggests that there is a need for standardized AI literacy frameworks and focuses with a tailored educational program to provide learners with essential AI competencies.

METHODOLOGY

The review paper utilizes a systematic literature review method to analyse AI literacy and its implications in higher education, emphasizing its relevance for information science professionals. The study is based on a thorough review of peer-reviewed journals, conference proceedings, and academic reports published within the last 5 years. The study strictly adheres to the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines to ensure that it follows systematic and structured processes to improve the transparency and robustness of systematic reviews. The research process is in multiple stages. Initially, the relevant studies are indicated in academic databases such as Wikipedia, Research Gate, and Google Scholar, ensuring that a wide, diverse collection of scholarly sources is integrated. An article is then screened based on pre-set inclusion and exclusion criteria to identify high-quality, relevant literature. The identified studies are subsequently analysed and thematically grouped with others into the final key areas, including: AI literacy frameworks, implementation strategies, challenges, and applications in academic libraries. A structured review process is used in this study to present a comprehensive body of evidence that contributes to the conceptualisation of AI literacy, which is a valuable insight for both the field of information science and higher education sectors, in general.

Theoretical Frame Work:

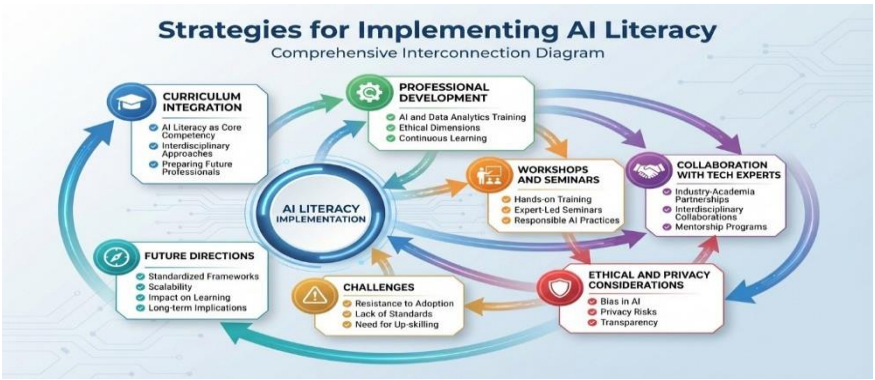

Figure.1 Strategies of implementing AI Literacy Strategies for Implementing AI Literacy

Higher education institutions and librarians can adopt various strategies to enhance AI literacy:

Curriculum Integration:

By infusing information science courses with AI-related discussions, we can arm students with the skills and knowledge needed to successfully traverse the AI-infused academic and professional landscape. Incorporating AI Literacy as Core Competency in LIS Curricula AI literacy should be woven into the fabric of LIS curricula, addressing the basic concepts of AI, the underlying principles of machine learning, ethical considerations, and real-world applications in academic libraries. A good curriculum promotes interdisciplinarian learning that would empower students to analyse AI technologies critically. AI course explosion But integrating AI coursework is one way for institutions to prepare future information professionals to respond to emerging tech trends and maximize library services.

Professional Development:

In developing the types of professional development programs to foster AI literacy in the universities, there should be a steer towards initiatives that educate on the basic elements of AI and data analytics and the ethical implications of AI implementation. These programs equip school and library professionals to adopt AI tools in academic services, research assistance, and decision-making. Fostering hands-on training Concisely via workshops, certification programs, and online courses results in continuous learning and up-skilling. Through building AI literacy in faculty and librarians, higher education institutions can better support research and production, and improve digital resource management in academic libraries.

Workshops and Seminars:

Work Shops and Seminars: Workshops and seminars are good for promoting AI literacy among students and educators. These events are an excellent opportunity to learn about AI-driven information retrieval systems, research assistance tools, and ethical challenges that are taking place when deciding to adopt AI in academia. In hands-on workshops, participants work with AI applications to develop their practical understanding and problem-solving skills. One of the measures that can be done is to have seminars and discussions led by experts so that the impact of AI on education and research can be understood that can ultimately contribute to creating a culture of responsible AI in higher education systems.

Collaboration with Tech Experts:

To create a context-specific and up-to-date curriculum on AI literacy, it is extremely important to work closely with AI specialists and technology experts. These partnerships can open discussions that apply to building interdisciplinary classes, research projects, and AI-driven library services in schools. Collaboration with industry repetitions enables AI curricula to keep pace with both emerging technologies and industry practices. Guest lectures, research collaborations, and mentorship programs that connect theoretical knowledge of AI to practical applications can also help enhance the AI competency in higher education through collaborative initiatives.

Ethical and Privacy Considerations in AI Usage

As AI is integrated into academic settings, ethical concerns arise, including:

Bias in AI algorithms- affecting information access:

Algorithms of AI heavily influence the way information is retrieved and shared - but they frequently express biases that influence how we access content and what type of information we feel has the most accuracy and diversity. Such biases can arise from skewed training data sets, algorithmic design, or entrenched social inequities incorporated into AI models. In academic libraries and higher education, biased AI results in flawed search results are perpetuating unequal representation of knowledge. Fighting algorithmic bias calls for ethical AI development, diverse training datasets, and continuous evaluation to ensure fairness and inclusion in information access.

Privacy risks associated with AI-driven data collection:

AI systems are learning from users by using large-scale data sets to build system effectiveness by data mining or data analysis. However, these mass data collection does come with serious privacy implications, including unauthorized access, data breaches, and surveillance threats. Institutions of higher education MUST adopt rigorous data governance policies, enforce compliance with data protection frameworks, and ensure transparency in how AI uses data. Promoting awareness among users and implementing ethical AI practices can help balance privacy risks and benefits of AI on academic growth.

Transparency in AI decision-making processes:

As reliance on AI in higher education expands, transparency in decision-making processes is key to trust and accountability. Many AI systems are "black boxes," which makes it hard for users to know why decisions are made. So many privacy, ethical, bias and explainability issues arise from it. Improved transparency can be achieved by adopting interpretable AI models and clear documentation of AI decision processes, and by integrating human oversight into AI systems to ensure ethical and responsible AI deployment within academic institutions.

Challenges and Future Directions

Despite the benefits, implementing AI literacy faces challenges such as:

Resistance to AI adoption among librarians and faculty:

Librarians, faculty, and academic institutions must also be cognizant of resistance against the implementation of AI-based tools within libraries. This hesitance springs from fears of job loss, insufficient technical knowledge, and uncertainty surrounding AI as a part of traditional library and teaching practices. Many educators and information professionals see AI as a disruptor rather than a collaborator in promoting research and learning. Resistance is also operated by fears of ethical challenges like bias in AI-driven decision-making and data privacy concerns. Conquering this uneasiness will demand specific-aimed awareness action programs, applied-software training, and institutional encouragement to show AI's possible role during creating and boosting in place of substituting human potential and capability in educational surroundings.

Lack of standardized AI literacy frameworks:

While the need for AI literacy is becoming increasingly recognized, there are few existing frameworks in place to implement this surge of interest in higher education and library science curricula. This leads to unequal learning outcomes as no widely acknowledged models for AI literacy exist, and preparing students and practitioners with necessary AI skills is problematic. Institutes may run their internal AI programs in various forms resulting in a lack of knowledge and skills on AI across institutions. Standardized frameworks would provide structure to service a comprehensive curriculum, ensuring AI education in the LIS domain addresses the ethical, technical and practical applications. Standardizing AI literacy can promote equity in this space by allowing all individuals access to learn about and understand the AI technologies that continue to impact their everyday lives on a global scale.

Need for continuous up-skilling in evolving AI technologies:

AI technologies are fast-accelerating and continually require information professionals to up-skill over new tools, methodologies and best practices. To incorporate AI applications such as machine learning, natural language processing, and automated data analysis into academic workflows, librarians, educators, and researchers need to continually learn (agencies as well). But professionals encounter barriers like lack of access to AI training resources, time constraints, and a lack of institutional support. Solution: Developing AI Literacy and Professional Development Programs: To bridge the knowledge gap, educators can benefit from structured AI literacy programs, professional development workshops, and collaborations with AI experts to gain hands-on experience. While new integration leads to a culture of continuous upskilling within higher education institutions, this smoothing wing helps in keeping information professionals aligned at the same pace of using AI for advanced research and academic offerings.

Future Directions:

Currently as AI evolves, future study must examine which measures might be best for implementing sustainable AI literacy in academic institutions. Designing discipline- and stage-specific standardised AI literacy frameworks is a critical area of study to explore. Institutions must explore scalability and expansion of the AI training framework into the current curriculum in such a way that it is appropriate and easy to implement. Research on how well AI-enabled pedagogical tools foster student engagement and learning outcomes is also needed.

It also requires long-term studies that will investigate its influence in the field of academic information services, including but not limited to changes in information retrieval, research efficiency, and digital equity. This will help ensure that the integration of AI in higher education is done responsibly- with an awareness of the ethical implications, such as algorithmic biases and data privacy.

CONCLUSION

As AI literacy turns out to be a new fundamental competency for higher education, even crucial one for people who work around the academic librarianship and research services, the present research is going to be a step for information science professionals who are stepping on AI in academic libraries. As AI-enabled tools advance information retrieval, automate mundane tasks, and augment decision-making, professionals must learn to employ these technologies responsibly and ethically. The paper discusses the importance of AI literacy and suggests that opportunities for structured training, ethics training or guidelines, and standardized frameworks for adoption, evaluation, and access to AI technologies should be available, among many other findings.

These include obstacles like hesitancy around AI integration, data privacy, and algorithmic biases; academic institutions can help break through them by embedding AI in the curriculum, encouraging professional development opportunities, and supporting interdisciplinary collaborations. Follow-up studies need to explore sustainable best practices around AI literacy initiatives, and the long-term implications these have for academic information services. The aim of this paper is to highlight how the adoption of AI-supported initiatives in Higher Education Institutions (HEIs) can improve the competencies of information professionals and, therefore, enhance digital transformation, optimize knowledge diffusion, and minimize risks to research integrity. To create a supportive AI-ready academic environment for both teachers and learners, it will be essential to strike a balance between innovation in AI and ethical accountability.

REFERENCES

1. Alamäki, A., Nyberg, C., Kimberley, A., & Salonen, A. O. (2024). Artificial intelligence literacy in sustainable development: A learning experiment in higher education. Frontiers in Education, 9, 1343406.
2. Becker, K. P., Parker, J. L., & Richter, D. (2024). Framework for the future: Building AI literacy in higher education white paper. Moxie AI Literacies White Paper. Retrieved from
3. Hazari, S. (2024). Justification and roadmap for Artificial Intelligence (AI) literacy courses in higher education. Journal of Educational Research and Practice, 14(1), 106–118.
4. Mah, D.-K., & Groß, N. K. (2024). Artificial intelligence in higher education: Exploring faculty use, self-efficacy, distinct profiles, and professional development needs. International Journal of Educational Technology in Higher Education, 21(58).
5. Salhab, R. (2024). AI literacy across curriculum design: Investigating college instructors' perspectives. Online Learning, 28(2), 22-47.
6. Subaveerapandiyan, A., Rahman, A. A., & Tan, P. C. (2024). Evaluating AI literacy proficiency among LIS researchers in ASEAN. Library Hi Tech News.
7. van Wyk, B. (2024). Exploring the philosophy and practice of AI literacy in higher education in the Global South: A scoping review. Cybrarians Journal, 73, 601.
8. The Wall Street Journal. (2024). Colleges race to ready students for the AI workplace. Retrieved from https://www.wsj.com/us-news/education/colleges-race-to-ready-students-for-the-ai-workplacecc936e5b.

9. Laupichler, M. C., Aster, A., Schirch, J., & Raupach, T. (2022). Artificial intelligence literacy in higher and adult education: A scoping literature review. Computers and Education: Artificial Intelligence, 3, 100101.
10. F., Watkins, R., & Medsker, L. (2021). Competency model approach to AI literacy: Research-based path from initial framework to model. Human-Technology Collaboration Lab, The George Washington University.
11. The required data to write introduction retrieved from https://en.wikipedia.org/wiki/Digital_literacy?utm_source=chatgpt.com
12. The required data written in introduction part by retrieved from https://en.wikipedia.org/wiki/Artificial_intelligence_in_education?utm_source=chatgpt.com.
13. Figure.1 created by using scispace by giving prompts through the link https://scispace.com/chat/3ca5e45a-1e04-4497-9db5-bb4ec1f72e83