

AI-Driven Social Media Learning Ecosystems in Higher Education: A PRISMA-Based Systematic Literature Review

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Abstract: The rapid evolution of Artificial Intelligence (AI) has revolutionized the Higher Education sector, impacting teaching, learning, assessment, and institutional management practice. At the same time, social media has developed into a dynamic learning platform that offers opportunities for collaboration, knowledge sharing and learner engagement. While the use of AI-driven tools in education is rising, the current studies on the subject are scattered, especially when it comes to the role of AI and social media in a holistic learning environment. Thus, the present study aims to present a systematic literature review based on the PRISMA that aggregates the current knowledge about the social media learning ecosystem in higher education through the use of artificial intelligence. The review comprised 80 peer-reviewed articles published from 2020 to 2026, sourced from prominent academic databases such as Scopus, Web of Science, ScienceDirect, SpringerLink, Taylor & Francis and Emerald Insight. A thematic synthesis method was used to derive the main themes in the studies, trends, methodological patterns and gaps in the existing studies. The results show that AI is being used more and more to support personalized learning, adaptive learning systems, learning analytics, generative AI applications, intelligent assessment and collaborative learning environments in the digital world. The review also emphasizes how AI and social media technologies are becoming increasingly interconnected in supporting learner engagement, learning networks, knowledge co-creation and data-informed education decision-making. But issues of academic honesty, privacy and confidentiality concerns, algorithmic bias, digital inequality, ethics in algorithmic governance, and learner well-being issues are still pressing. The study also finds key methodological and contextual gaps, such as few long-term studies, lack of ecosystem-based studies, and lack of representation of developing countries. By offering a comprehensive ecosystem view of the nature of the transformation of education through AI, the review makes a significant contribution to the existing body of literature and provides practical implications for educators, school leaders, policy makers, and researchers. The results highlight the importance of responsible, inclusive and human-centred development of future social media learning ecosystems in higher education that use AI.

Keywords: NA

1. Introduction

The educational environment is changing dramatically as a result of the speed of technological development, digital communication systems, and the ubiquity of Artificial Intelligence (AI) technologies. AI-powered learning platforms and social media learning systems are becoming a key part of higher education in many countries around the world as higher education institutions seek to enhance instruction and learning, increase accessibility, and improve learner engagement. From its original role as a communication tool, social media platforms like YouTube, LinkedIn, WhatsApp, Telegram, Facebook, Instagram, and X have become vibrant learning environments, enabling collaborative learning, digital networking, peer interaction, and knowledge sharing.



At the same time, AI tools like machine learning, natural language processing, predictive analytics, adaptive learning systems, intelligent tutoring systems and generative AI are revolutionizing learning experiences by delivering personalised and learner-centred experiences. AI systems can offer personalized, adaptive learning experiences by tailoring instructional methods, delivering feedback, and modifying the learning content in response to the learner's performance.

With the onset of COVID-19, the pandemic drove global education institutions into the online and hybrid learning environment, accelerating the growth of AI in higher education. AI tools like AI-powered recommendation systems, virtual tutoring systems, automated assessment tools, and learning analytics systems were gaining a foothold in educational organizations to maintain continuity in the educational process. In the modern era of education, AI-powered learning ecosystems allow for interactive learning, personalized feedback, collaborative learning, and flexible academic support in real-time across various educational settings.

AI and the social media learning ecosystem have brought with them some exciting opportunities for innovation in the educational world. AI systems can assist in creating individualized learning trajectories, making personalized recommendations based on the preferences, performance, and behavior of learners. Learning analytics tools offer the ability for institutions to detect at-risk students and to design and implement strategies at the right time. With the use of generative AI tools like ChatGPT, educators can now support students in creating content, writing academic papers, learning languages, grasping concepts, and engaging in interactive tutoring.

Despite these developments, there are a few pedagogical and ethical issues that still arise. Concerns about data privacy, algorithmic bias, misinformation, academic dishonesty, dependency on technology, and unequal access to technology are a growing concern. There are also concerns about the decrease in human interaction in educational settings and the reliance on AI systems.

The existing literature shows a lot of research that has been dedicated to the Artificial Intelligence in Education (AIED) and the social media learning field. The literature, however, is dispersed and is found in many different disciplines such as education, computer science, psychology, communication studies and management. The majority of studies focus on AI-based learning systems or on SBL, with very few systematic reviews that systematically combine both these areas in higher education.

This study seeks to carry out a systematic literature review on social media learning ecosystems in the field of higher education using AI tools, based on the PRISMA guideline. The review aims to integrate the literature on the subject, outline key research lines, highlight opportunities and challenges, review theoretical and methodological gaps and suggest research future directions.

Need and Significance of the Study

As Artificial Intelligence (AI) and social media continue to become more deeply embedded in higher education, it is necessary to systematically and scientifically review the educational ecosystem. AI-powered educational technologies have become more crucial for educational institutions around the world to enhance student learning, collaboration, communication, and data analysis. But with the rapid growth of technology has come ethical, governance-related, and pedagogical issues.

While research on AI in education and social media learning are separate, there is a lack of a comprehensive integration of these two fields in a few systematic literature reviews. Additionally, the rise of generative AI technologies has ushered in a demand for the need of new reviews that can incorporate new developments, research trends, opportunities, challenges, and future directions. This research makes a valuable contribution to the ongoing discourse on how AI can transform education and has the potential to guide further research, policy decisions, and educational practices.

Research Questions

RQ1: What are the dominant themes in the literature on AI-driven social media learning ecosystems in higher education?

RQ2: What opportunities and challenges are associated with AI-supported social media learning?

RQ3: What methodological and theoretical gaps exist in current research?

RQ4: What future directions should guide research and policy in AI-enabled higher education ecosystems?

2. Research Methodology

2.1 Research Design

This study is a Systematic Literature Review (SLR) following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020) methodology. The structured and transparent procedure implemented in PRISMA enhances the reliability and reproducibility of review studies by helping to identify, screen, select and synthesise scholarly literature. As Artificial Intelligence (AI), social media learning and higher education technologies have developed rapidly, the systematic review approach was adopted to bring together the disparate knowledge and to explore new trends, challenges and future research directions.

The review is directed towards research that investigates how AI, social media learning, digital learning ecosystems, learning analytics, generative AI, educational transformation and higher education intersect. This study seeks to bring together the findings of the research works carried out in the field and would give a comprehensive picture of the impact of AI-based technologies in the higher education social learning ecosystems. The study is a combination of systematic review procedures and thematic synthesis to provide an overview of major research streams, emerging trends, methodological patterns, and gaps in the field of AI-driven social media learning ecosystem in higher education.

2.2 Search Strategy

A comprehensive literature search was conducted across major academic databases recognized for publishing high-quality research in education, technology, Artificial Intelligence, and digital learning. The databases selected for the review included:

- Scopus
- Web of Science
- ScienceDirect
- SpringerLink
- Taylor & Francis Online
- Emerald Insight

The search process utilized combinations of keywords related to Artificial Intelligence, social media learning, educational ecosystems, higher education, learning analytics, and generative AI. Boolean operators were employed to enhance search precision and ensure comprehensive coverage of the relevant literature.

A representative search string was formulated as follows:

("Artificial Intelligence" OR AI OR "Generative AI" OR ChatGPT)
AND
("Social Media" OR "Social Learning" OR "Digital Learning")
AND
("Higher Education" OR University OR College)
AND
("Learning Ecosystem" OR "Educational Ecosystem")

The search was limited to studies published between 2020 and 2026 to capture contemporary developments associated with Artificial Intelligence, generative AI, social media learning, and digital educational transformation in higher education.

2.3 Inclusion and Exclusion Criteria

To ensure consistency and relevance, predefined inclusion and exclusion criteria were established prior to the screening process.

Table 2.1 Inclusion and Exclusion Criteria

Criterion	Inclusion Criteria	Exclusion Criteria
Publication Type	Peer-reviewed journal articles	Editorials, conference abstracts, book reviews
Publication Period	2020–2026	Publications before 2018
Language	English	Non-English studies
Research Area	AI in education, social media learning, learning ecosystems, higher education	Purely technical AI studies unrelated to education
Educational Context	Higher education institutions	School education and non-educational contexts
Source Quality	Scopus/Web of Science indexed journals and reputable publishers	Predatory or non-indexed publications

2.4 Study Selection Process

The process of selecting studies was performed in the following four steps: Identification, Screening, Eligibility Assessment, and Inclusion (according to the PRISMA framework).

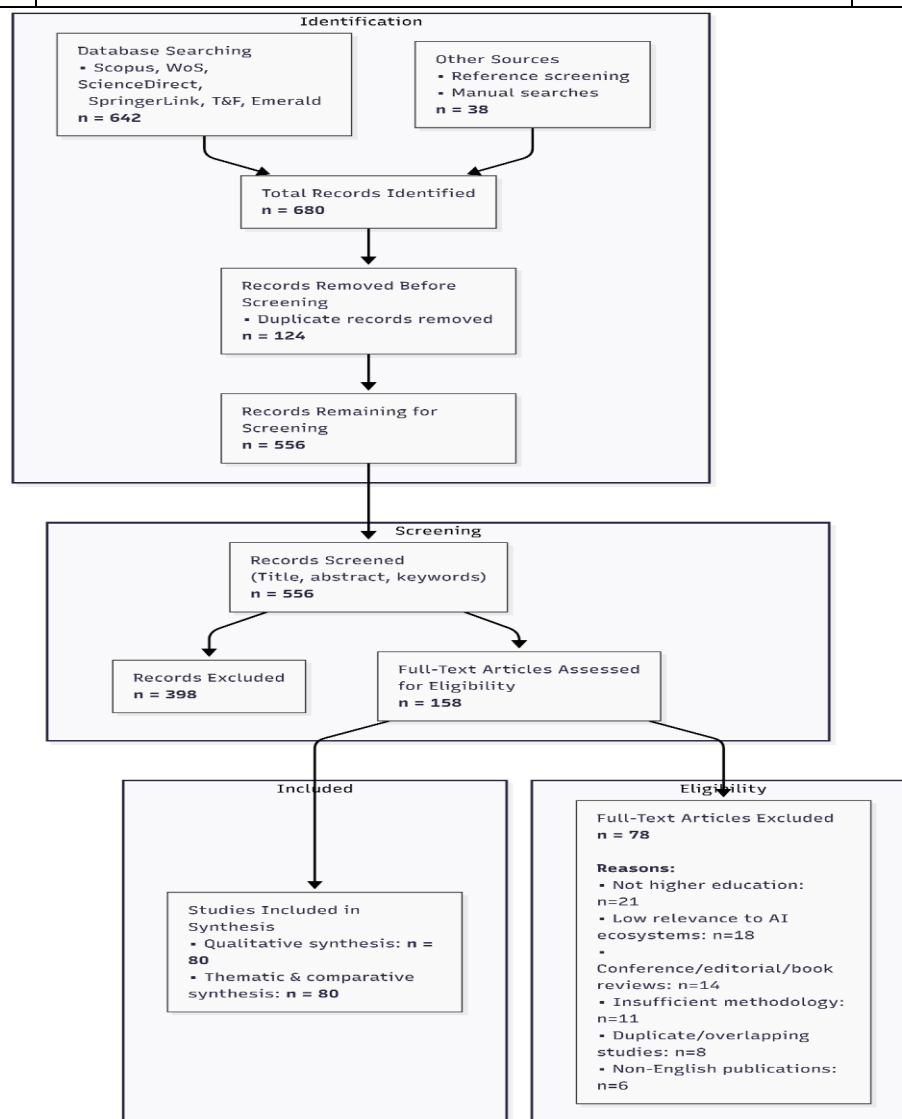
The first search of the database gave 399 results. After removal of duplicate records, 312 records were left for screening of title, abstract, and keywords. During this step, studies on topics other than Artificial Intelligence, social media learning, educational ecosystems, or higher education education were discarded. Later, 86 full-text articles were reviewed according to the pre-established inclusion and exclusion criteria.

Studies that did not provide sufficient discussion of the role of AI in learning ecosystems or relevance to higher education were excluded after a detailed evaluation, as were studies that were not methodologically sound. A total of 80 studies that met all the inclusion criteria were included in the final review and then subject to thematic synthesis and comparative analysis.

Figure 1. PRISMA 2020 Flow Diagram for Study Selection Process

Phase	Flow & Step Description	Action / N-Count
Identification	Records identified through database searching: Scopus, Web of Science, ScienceDirect, SpringerLink, Taylor & Francis, Emerald	n = 642
	Additional records identified through other sources: Reference screening and manual searches	n = 38
	Total records identified for processing	n = 680
	<i>Minus:</i> Duplicate records removed before screening	n = 124
	Total records remaining for screening	n = 556
Screening	Records screened by title, abstract, and keywords	n = 556
	<i>Minus:</i> Records excluded after title/abstract check	n = 398
	Full-text articles assessed for eligibility	n = 158
Eligibility	Full-text articles excluded, with reasons:	n = 78

	• Not focused on higher education • Limited relevance to AI-driven learning ecosystems • Conference abstracts/editorials/book reviews • Insufficient methodological information • Duplicate findings or overlapping studies • Non-English publications	n = 21 n = 18 n = 14 n = 11 n = 8 n = 6
Included	Studies included in final review: • Qualitative synthesis • Thematic analysis and comparative synthesis	n = 80 n = 80 n = 80



2.5 Quality Assessment

Only peer-reviewed articles published in high-quality, academic journals included in Scopus, Web of Science, or major scholarly publishers were kept to guarantee the quality and relevance of the studies provided. Studies were

assessed in terms of their relevance to the topic of the study, methodological clarity, theoretical contribution, and empirical rigour.

2.6 Data Extraction and Analysis

To ensure uniformity, a structured data extraction process was used. The information that was extracted from each study covered the following: Publication details, year of publication, country of origin, research objectives, methodology, areas of AI application, educational context, key findings, challenges, and future research recommendations.

A thematic synthesis analysis was used to analyse the selected studies. A constant coding and comparing of the literature was carried out which resulted in themes and patterns emerging. Key themes which emerged from the analysis were:

- AI-enabled personalized learning
- Generative AI in higher education
- AI-driven social media learning ecosystems
- Learning analytics and predictive systems
- Institutional transformation and governance
- Ethics, sustainability, and human-centred AI

By using the thematic synthesis approach, the findings of the various methodological traditions and disciplinary lenses were integrated, allowing for a complete picture of the learning ecosystem in higher education through the lens of social media and AI.

3. Findings and Discussions

3.1 Evolution of AI-Driven Learning Ecosystems in Higher Education (2022–2026)

Since 2022, the use of Artificial Intelligence (AI) has surged in higher education, significantly reshaping the landscape of education by creating intelligent, data-driven and connected learning environments. Initial research work concentrated on the use of AI for improving the accessibility of education, personalised learning, learning analysis and institutional performance. Studies have shown that AI-driven educational systems have the potential to enhance learning experiences by enabling intelligent content delivery and tailoring instruction to individual student needs, as well as providing additional support for remote and resource-poor educational settings (Ijiga et al., 2022, Ahmad et al., 2023, George & Wooden, 2023). All these progressions paved the way for a wider shift from technology enhanced teaching to smart teaching environments that can serve different types of learners.

With the growth of the field, the importance of AI has been seen as more than just a technology; it is one of the key forces shaping the future of education. AI's impact on the creation of learning materials, planning and managing institutions, governance, and decision-making processes in education was emphasized. The research highlighted the growing trend of HEIs implementing AI-driven architectures, predictive systems, and intelligent learning management solutions to boost operational efficiency, academic quality, and student outcomes (Aithal & Maiya, 2023; Abbasi et al., 2025; Ananda et al., 2025; Alotaibi, 2024). This is part of a larger trend toward data-driven, tech-forward learning environments that can adapt quickly to evolving teaching and learning and societal needs.

Since 2023, generative AI technology has come to the forefront in higher education, representing a major advancement. The widespread use of conversational AI tools, large language models, and AI-assisted content creation platforms sparked a significant amount of scholarly research into the implications for teaching, learning, assessment, and academic communication. The potential benefits of generative AI in various academic writing tasks and language learning, personalized tutoring, generation of feedback, and learner engagement, along with the concerns about academic integrity, misinformation, plagiarism, and learner dependency, have been highlighted (Bozkurt, 2023; Baskara, 2023; Chan & Colloton, 2024; Hashmi & Bal, 2024; Deepshikha, 2026). Although generative AI can provide significant opportunities for educational innovation, it must be carefully pedagogically designed and well governed to be effective in practice.

The other major development in recent years' scholarship is the intersection of AI, mobile learning and social media in educational spaces. Research shows that social media is becoming a space for learning together in which

students interact with their peers, share work, interact academically, and create knowledge together. The incorporation of AI-powered recommendation systems, intelligent analysis, chatbots, and adaptive content delivery systems has enriched the educational content of these platforms, making their digital experiences more interactive and learner-centred (Almogren et al., 2024; Amjad et al., 2024; Brown & Foster, 2023; Alshahrani et al., 2024). This convergence has helped to create AI-enhanced social learning ecosystems, which expand learning beyond the walls of the classroom.

Recent research also shows a rise in the interest of data-driven educational management and intelligent decision-support systems. AI-driven analytics are becoming increasingly used to track student performance, forecast success, tailor feedback, and identify students that are at risk of dropping out as well as to inform institutional planning. These advancements have bolstered the value of evidence-based decision-making in higher education and emphasized the need of incorporating learning analytics into wider educational ecosystems (Ahmad et al., 2023; Chigbu & Makapela, 2025; Durón & Jiménez-Preciado, 2026; Deri et al., 2024). This growing dependence on education data is a further sign that the whole world is moving towards intelligent systems that can facilitate continuous improvement in education, learning and institutional performance.

In addition to technological progress, the ethical, social, and governance aspects of AI adoption have come into greater focus. Modern research emphasizes the importance of comprehensive policy frameworks, clear governance, and ethical implementation approaches to surmount challenges related with privacy, algorithmic bias, digital inequalities, and accountability (Chan, 2023; Al-Zahrani & Alasmari, 2025; Baradaran, 2024; Imran & Almusharraf, 2024). Moreover, researchers are starting to examine more comprehensive educational models that integrate emotional intelligence, social learning, inclusivity, and wellbeing in the context of AI-enabled learning spaces, as effective educational transformation should not solely rely on technological advances but also on education values that are human-centred (Akintayo et al., 2024; Eden et al., 2024).

The literature published in the period between 2022 and 2026 thus represents an evolution from isolated use of AI, to personalised learning, collaborative learning, intelligent analytics, generative technologies, and institutional change, towards a model of integrated educational ecosystems. The use of AI is emerging as a key driver of innovation and sustainable development within higher education institutions (Adeoye & Otemuyiwa, 2024; Capinding & Dumayas, 2024; Barile et al., 2026). However, issues of ethics, governance, inclusiveness, academic integrity and long-term educational outcomes remain relevant topics for current scholarly discussion.

3.2 Thematic Review

3.2.1 AI-Powered Personalised & Adaptive Learning

One of the most notable applications of Artificial Intelligence in higher education is personalization. Current AI systems make use of information about a learner, their behaviour, performance, learning style, and engagement to provide personalised learning experiences. Studies show that adaptive learning environments with AI can tailor content, difficulty, feedback, and learning paths based on each learner's needs. Research on personalized learning systems confirms that they have a positive impact on the learner's engagement and motivation, academic performance, and ability to learn at their own pace (Klašnja-Milićević & Ivanović, 2021; Kaswan et al., 2024; Yekollu et al., 2024; Yu & Yao, 2024).

AI-based personalization also goes beyond delivering content to intelligent recommendation systems, adaptive assessment frameworks, predictive support mechanisms, and self-regulated learning environments, as suggested by recent investigations. By combining AI technologies with LAs, institutions have started to offer timely intervention and personalized support for their students of various backgrounds (Lan & Zhou, 2025; Sajja et al., 2025; Vashishth et al., 2024; Saragih, 2024). Yet issues of excessive reliance on algorithmic recommendations, learner autonomy and the possible constriction of educational experiences through highly individualised learning pathways are concerns.

3.2.2 Generative AI and Educational Transformation

Generative AI has changed the face of Higher Education. The advent of large language models and conversational AI systems opens up new possibilities for assistance with academic writing, tutoring, content creation, feedback, language learning, and problem-solving. ChatGPT and similar technologies hold significant promise for improving both the engagement of students and the quality of their learning experiences, while also supporting educators' workflows and streamlining the teaching process. The pedagogical application of ChatGPT and related technologies has garnered growing interest regarding their potential to boost learner engagement, instructional support, and educational productivity (Bozkurt, 2023; Jo, 2024; Monib et al., 2025; Zekaj, 2023).

In assessment and evaluation, AI systems are helping to enhance grading efficiency and accuracy with automated tools, tailor feedback to individual student needs, and create adaptive learning materials (Naseer et al., 2024; Deepshikha, 2026). However, the issues often discussed in the literature are plagiarism, misinformation, academic integrity, excessive reliance on AI outputs, and decreasing critical thinking. Therefore, it is important to have AI literacy, guidelines for responsible use, and institutional governance to ensure that generative AI technologies are implemented in an ethical manner within higher education (Chan, 2023; Hashmi & Bal, 2024; Mahajan, 2026).

3.2.3 AI-Driven Social Media and Collaborative Learning Ecosystems

Social media have grown from communication to being a dynamic learning environment where collaboration, networking, knowledge sharing and peer-learning are a possibility. The use of AI technologies in social media has improved social media's educational approaches by enabling intelligent recommendation systems, personalized content, automated moderation, and analytics on learner engagement. AI tools in social media can enhance academic engagement, collaboration, and digital interaction in university settings, as evidenced by various studies (Almogren et al., 2024; Amjad et al., 2024; Shahzad et al., 2024).

The study of collaborative learning also found that collaborative learning in higher education institutions can be assisted by the use of virtual collaborative learning tools that are supported by artificial intelligence in order to facilitate the collaborative process of learning, creation of knowledge, communication, and building of community. (Jony & Hamim, 2024; Kovari, 2025). The idea of connected learning ecologies has become increasingly popular, and is focused on how learners connect in formal and informal learning settings through digital networks, social media communities, and AI-mediated platforms (Peters et al., 2022; Brown & Foster, 2023; Nguyen & Tuamsuk, 2022). However, misinformation, digital distraction, privacy, and mental health concerns still pose difficulties for successful incorporation of social media into educational environments.

3.2.4 Learning Analytics, Prediction, and Intelligent Decision-Making

In the realm of higher education, learning analytics is one of the more significant uses of AI. The use of AI-powered analytics systems allows institutions to analyse vast amounts of educational data, detect trends in student learning, forecast outcomes, and offer evidence-based support measures. By leveraging AI-powered analytics systems, institutions can process extensive educational data, uncover trends in student behavior, predict outcomes, and deliver evidence-based interventions. The study reveals that predictive analytics can support institutions in identifying students at risk of dropping out, refining retention initiatives, and boosting academic performance (Ahmad et al., 2023; Najdawi et al., 2024; Nuangchalerms, 2023).

In recent years, researchers have explored learning analytics applications, extending beyond mere monitoring and reporting of student learning to a personalized feedback system, adaptive interventions, prediction of educational excellence, and intelligent pedagogical decision making (Sajja et al., 2025; Vashishth et al., 2024; Tariq, 2024). The developments are aligned with the increasing trend of data-driven educational management, in which decisions made within the institution are increasingly based on real-time information about learners. But there are still questions to be dealt with regarding privacy of information, transparency of algorithms, and ethical use of educational data.

3.2.5 Institutional Transformation, Governance, and Educational Innovation

AI is increasingly shaping the governance of higher education institutions, their organizational structures, and the strategic management approaches they use. AI is not a classroom technology, but also an institution transformation tool, researchers say. Researchers have emphasized that AI can assist with various aspects of academic administration, curriculum development, quality assurance, governance systems, and strategic planning processes (George & Wooden, 2023; Khairullah et al., 2025; Ukeje et al., 2024).

Innovation ecosystems integrating AI that can drive sustainable educational transformation and institutional resilience has also been a focus of recent scholarship (Secundo et al., 2025; Barile et al., 2026; Zhang et al., 2025). Meanwhile, literature acknowledges the challenges with organizational readiness, leadership capacity, engagement of stakeholders and policy implementation in the AI-supported educational environment (Sharma et al, 2022, Chigbu & Makapela, 2025, Ruano-Borbalan, 2025).

3.2.6 Ethics, Sustainability, and Human-Centred AI in Education

AI is increasingly becoming integrated into educational systems, thus ethical and sustainability issues have acquired a major place in current scholarship. Issues of privacy, algorithmic bias, accountability, surveillance, digital inequality, and learner autonomy have been identified as challenges (Khan et al., 2025; Mahajan, 2026; Komljenovic

et al., 2025). As the use of learner data and automated decision-making systems grows, it is essential to develop transparent governance frameworks and responsible AI practices.

Recent research has called for taking a human-centered perspective in the implementation of AI, which focuses on inclusivity, emotional well-being, social learning and sustainable educational development (Akintayo et al., 2024; Eden et al., 2024; Mutambik, 2024; Strielkowski et al., 2025). The literature indicates that the future educational ecosystems should be characterized as a balance between technological innovation and pedagogical values, ethical responsibility and learner's well-being. This view is supported by the new conversations about sustainable higher education, digital citizenship and the responsible educational transformation in the era of artificial intelligence.

3.2.7 Methodological Approaches in Existing Literature

The literature reviewed here has shown great variation in both methods and approaches of studying learning ecosystems in higher education with the help of AI. The number of quantitative methods used is higher; researchers often employ surveys, structural equation modelling, predictive analytics, learning analytics, and data-driven evaluation methods to analyze factors influencing learner engagement, academic outcomes, technology acceptance, and educational outcomes, among other areas (Shahzad et al., 2024; Najdawi et al., 2024; Yu & Yao, 2024). These studies offer valuable empirical insights for the efficacy of AI assisted learning interventions and digital learning environments.

In addition to quantitative studies, some recent examinations have used qualitative, conceptual, and systematic reviews approaches to study the pedagogical, ethical, governance, and institutional aspects of integrating AI in higher education more broadly (Bozkurt, 2023; Alshahrani et al., 2024; Kovari, 2025; Lan & Zhou, 2025). There has also been growing scholarship on using tools such as bibliometric analysis, case study methods, systems thinking, and an ecosystem approach to enable the understanding of the complex dynamics between learners, educators, institutions, technologies, and policy environments (Liew et al., 2024; Secundo et al., 2025; Ruano-Borbalan, 2025). Even with this methodological mix there are limited longitudinal studies, mixed-method investigations, and cross-cultural comparison studies, suggesting opportunities for methodological development in the field in the future.

3.3 Critical Analysis of the Literature

Research literature on the potential of AI in higher education shows significant advancements in the understanding of the role of AI in higher education, yet some conceptual, methodological and practical challenges stand out. Despite the recognition from most studies of the potential of AI to improve personalization, engagement, efficiency, and accessibility of education, the literature often has a technology-driven focus that tends to overlook pedagogical effectiveness and instead highlights the features of AI systems. This means there is a lack of deeper exploration of the ways in which AI can align with educational theories, instructional design principles, and pedagogies that focus on the learner. Many studies, therefore, have concentrated on the functionalities of the technology but not studied the way in which AI fits into educational theories, instructional design principles and pedagogies that focus on the learner.

Some of the major assets of the literature are the large number of articles covering personalized learning, adaptive educational systems, generative AI applications, and learning analytics. AI has been consistently shown to yield positive results in educational settings, such as: enhancing engagement, providing personalized feedback, supporting learning and data-driven decision making. Research also highlights the increasing use of AI in curriculum design, automated assessment, educational governance, and innovation. In sum, these insights demonstrate the critical role of AI in higher education's digital transformation.

Notwithstanding these advances, there is a clear disparity between the approaches to technological opportunities in the literature and those to educational challenges. Many studies offer fuzzy evidence of the long-term learning outcomes, critical thinking, learner autonomy, and knowledge retention of AI and make it seem a positive innovation. Many studies offer limited empirical evidence about the long-term learning outcomes, critical thinking development, learner autonomy, or knowledge retention of AI and then paint a picture of what AI is doing as an innovation that's good. The fact that the stories presented are mostly positive, might lead to a higher perception of the effectiveness of AI for learning, and a lower perception of potential risks of over-automation and dependence on AI.

Another constraint relates to the scattered character of the research that has been published. There are many studies on AI in education and a lot of studies on social media learning, but few studies discuss these two topics together in the overall context of an educational ecosystem. Most investigations have concentrated on individual technologies (e.g., ChatGPT, learning analytics platforms, AI-based tutoring systems, or social media apps) while

overlooking the interplay among these technologies in shaping learning behaviours, interactions, digital engagement, and learning outcomes. Such fragmentation limits the ability to see a broader picture of social media learning ecosystems as a whole learning environment powered by AI.

The literature is still mostly based on cross-sectional surveys, perception-based studies, conceptual discussions, and systematic reviews methodologically. These methods give insight into attitudes, patterns of adoption and trends, but do not give evidence of causality or long-term impact on the education. Self-reported data is often used for empirical studies, and this can be affected by response bias and situational factors. Comparative international studies, experimental research designs, mixed-method investigations and longitudinal studies are not yet very prevalent and tend to be limited with respect to the generalizability of current findings.

Still another important issue is geographical concentration. Many of the sources in the literature are from technologically advanced and digitally mature educational systems. There has been an increasing number of studies on AI adoption in emerging economies in recent years, but there are relatively few examples from developing countries. As a result, areas like digital inequalities, infrastructure problems, cost, multilingual learning contexts and contextual adaptation are not adequately addressed in academic research. The restriction is highly significant for higher education systems in developing countries where social media is being widely adopted for learning, but AI adoption is still not uniform.

The swift development of large language models has also brought in new dimensions that are not well covered in the literature. The potential applications of conversational AI systems in the field of learning support, content creation, and academic productivity are well understood, yet various issues surrounding academic integrity, misinformation, algorithmic bias, plagiarism, cognitive dependence, and assessment validity remain contentious. A coherent consensus has not been reached in the existing literature on the pedagogical models, governance structures, and ethical principles to guide the use of generative AI in higher education.

There is also a lack of attention to the emotional, psychological and social aspects of AI-supported learning in the literature. While there is a focus on learner engagement, few studies focus on the impact of AI on learner well-being, emotional learning, motivation, digital fatigue, social interaction, and mental health. It is crucial to grasp these human-centred aspects to facilitate sustainable and responsible educational transformation in the context of increasingly complex and complex reliance on AI technologies in educational ecosystems.

The literature reviewed generally suggests that AI has a transformative potential in the realm of higher education, but with notable theory, methodology, contextual, and ethical gaps. The research needs to extend beyond technology adoption frameworks to more comprehensive ecosystem-based perspectives, which also address the effectiveness of teaching and learning, learner well-being, institutional ready, governance, and future education outcomes. This will help to create a more balanced understanding of AI generated social learning ecosystems and aid the responsible development of inclusive and sustainable educational innovation.

3.4 Comparative Synthesis

The analyzed literature reveals the multi-faceted nature of the transformation of education with the help of AI, in which there are different interconnected aspects such as personalization of learning, generative AI, social media-based learning collaboration, learning analytics, institutional change, and ethical governance. These themes all help to shape intelligent learning ecosystems, each with its own areas of strengths, challenges, and research gaps. In Table 2.1, a comparative synthesis of the major themes identified in the literature is presented.

Table 2.1 Comparative Synthesis of Major Themes in AI-Driven Social Media Learning

Theme	Key Contributions	Representative Studies	Major Strengths	Limitations / Research Gaps
AI-Enabled Personalized Learning	Adaptive learning pathways, personalized feedback, learner modelling, self-regulated learning support	Klašnja-Milićević & Ivanović (2021); Kaswan et al. (2024); Lan & Zhou	Enhances learner engagement, flexibility, and individualized learning experiences	Limited evidence on long-term learning outcomes and learner autonomy

		(2025); Yekollu et al. (2024)		
Generative AI in Education	Academic writing support, tutoring, content generation, automated feedback, assessment assistance	Bozkurt (2023); Jo (2024); Hashmi & Bal (2024); Monib et al. (2025); Deepshikha (2026)	Improves accessibility, productivity, and personalized academic support	Concerns regarding plagiarism, misinformation, academic integrity, and overdependence
AI-Driven Social Media Learning	Collaborative learning, digital engagement, peer interaction, knowledge sharing, intelligent content recommendations	Almogren et al. (2024); Amjad et al. (2024); Shahzad et al. (2024); Jony & Hamim (2024)	Supports collaborative learning and learner engagement beyond formal classrooms	Limited ecosystem-level studies integrating AI and social media learning
Learning Analytics and Predictive Systems	Student performance prediction, personalized interventions, intelligent decision support, academic monitoring	Ahmad et al. (2023); Najdawi et al. (2024); Sajja et al. (2025); Vashishth et al. (2024)	Facilitates data-driven educational decision-making and early intervention	Data privacy concerns and lack of transparency in predictive models
Institutional Transformation and Governance	AI-supported administration, curriculum innovation, strategic planning, educational sustainability	George & Wooden (2023); Khairullah et al. (2025); Ukeje et al. (2024); Chigbu & Makapela (2025)	Strengthens institutional efficiency and strategic management	Insufficient empirical evidence regarding implementation effectiveness
Ethics, Sustainability and Human-Centred AI	Responsible AI adoption, inclusivity, digital well-being, policy frameworks, ethical governance	Chan (2023); Khan et al. (2025); Mahajan (2026); Komljenovic et al. (2025)	Promotes responsible and sustainable educational transformation	Lack of comprehensive governance models and cross-cultural validation
Educational Ecosystems and Digital Transformation	Ecosystem thinking, interconnected learning environments, AI-enabled innovation and sustainability	Nguyen & Tuamsuk (2022); Liew et al. (2024); Secundo et al. (2025); Barile et al. (2026)	Provides holistic understanding of educational transformation	Conceptual development exceeds empirical validation

The comparative synthesis shows that the two most widely studied themes in the literature are personalized learning and generative AI. Meanwhile, the social learning ecosystems enabled by AI, governance models for AI in education, the role of emotional dimensions of AI-supported learning and the transformation of education at the ecosystem level are relatively under-researched. In addition, much is known about the technologic potential of AI, but much less about educational outcomes over time and positive wellbeing, or institutional preparedness and sustainable practices. The findings suggest the necessity of further cross-disciplinary research with an integrated approach to the educational ecosystem, encompassing technological, pedagogical, social, ethical and governance aspects.

3.5 Emerging Research Trends

Artificial Intelligence (AI) and digital technologies are rapidly transforming the landscape of higher education to become intelligent, connected and learner-centred educational ecosystems. Upon studying the literature that has recently been published, it becomes evident that there are several trends that are influencing the trajectory of future social media-based learning environments in which AI plays an important role. A review of the literature suggests that there are a number of trends that are influencing the direction of the future of social media-based learning environments in which AI has an important role. The trends are related to the evolution of technology and pedagogical approaches, but also to shifting institutional priorities, learners' expectations, and governance needs.

3.5.1 Expansion of Generative AI in Teaching and Learning

Generative AI technologies like ChatGPT, large language models, intelligent content generators and conversational learning assistants are the biggest trend to emerge. Generative AI has been recently employed for academic writing support, customized instruction, content creation, marking, language learning, and knowledge exploration (Bozkurt, 2023; Jo, 2024; Hashmi & Bal, 2024; Monib et al., 2025). The increasing adoption of generative AI in education highlights a shift from conventional educational technologies towards AI-driven learning companions that can provide support to students throughout their educational experiences.

3.5.2 Growth of Personalized and Adaptive Learning Systems

A crucial shift is the growing focus on personalized and adaptive learning environments. AI systems are increasingly leveraging the data on learners, behavioural analytics, and performance metrics to tailor learning paths, instructional content, assessment methods, and feedback processes. Adaptive learning technologies are increasingly emerging as a key factor in boosting learner engagement, flexibility, and educational outcomes (Kaswan et al., 2024; Yekollu et al., 2024; Lan & Zhou, 2025; Strielkowski et al., 2025). This trend is in line with teaching practices that are learner-centred, valuing diversity in learning preferences, abilities and progress.

3.5.3 Integration of AI with Social Media Learning Ecosystems

AI and social media are an emerging field of academic and practical research. Recommendation algorithms, intelligent chatbots, custom-built content delivery systems, and learning analytics are making social media platforms more and more educational spaces. Research shows that AI-powered social media platforms are effective in supporting collaborative learning, peer interaction, knowledge sharing, academic networking and digital engagement (Almogren et al., 2024; Amjad et al., 2024; Shahzad et al., 2024). This pattern demonstrates the development of learning ecosystems that are socially connected, and bring learning outside the walls of formal institutions.

3.5.4 Data-Driven Educational Decision-Making

With the increasing adoption of learning analytics, predictive modelling and the use of educational data mining, data-driven decision-making is a key trend in higher education today. AI-driven analytics are becoming an integral part of educational institutions, supporting them in analyzing student data, forecasting academic success, identifying students at risk, and making more effective academic decisions (Najdawi et al., 2024; Sajja et al., 2025; Vashishth et al., 2024). Data-driven decision-making in education management is a trend towards evidence-based practices to enhance institutional efficiency and student achievement.

3.5.5 Human-Centred and Ethical AI Development

The increased use of AI has led to an increasing awareness that with technology comes a responsibility for ethics and a focus on the human aspect. The need for transparency, accountability, privacy protection, fairness, inclusiveness, and learner well-being is highlighted as key factors in AI-supported education (Chan, 2023; Khan et al., 2025; Mahajan, 2026). It is increasingly being suggested that AI be used in a responsible manner in education,

ensuring that the technologies are used effectively, that there is equity in the use of AI technologies and that there is ethical governance of AI technologies.

3.5.6 AI-Supported Educational Governance and Institutional Transformation

AI is not just reshaping the future of education and learning but also impacting higher education governance, administration, strategic planning, and quality assurance. Research shows that AI is increasingly driving institutional change by providing smart decision-making tools, automating administrative tasks, creating forecasting models, and developing innovative approaches for education and learning (George & Wooden, 2023; Khairullah et al., 2025; Ukeje et al., 2024). This is a sign of the growing importance of AI as a tool for institutional competitiveness and sustainability.

3.5.7 Development of Sustainable and Inclusive Educational Ecosystems

In the context of AI-driven transformation in education, sustainability and inclusivity have become key themes. The importance of using AI to foster equitable access to education, cater for diverse learner populations, minimize educational barriers and contribute to sustainable development goals (SDGs) seems to be increasingly gaining traction in the literature (Mutambik, 2024; Chigbu & Makapela, 2025; Okada et al., 2025). This trend illustrates an increasing focus on making technology innovative for the larger goal of learning and society.

3.5.8 Emergence of Ecosystem-Based Educational Models

Higher education is often viewed in a new light, as a complex ecosystem that involves learners, educators, institutions, technologies, policies, and digital communities. Increasingly, higher education is conceptualized as a complex ecosystem, involving learners, educators, institutions, technologies, policies, and digital communities. Researchers are beginning to investigate how different technologies can work together to form integrated learning spaces, such as AI-powered learning environments (Liew et al., 2024; Secundo et al., 2025), social media and learning analytics (Nguyen & Tuamsuk, 2022), or governance systems and innovation networks (Barile et al., 2026). The ecosystem approach is also a departure from the technology-focused research and the new approaches focus on the educational, social and institutional dimensions.

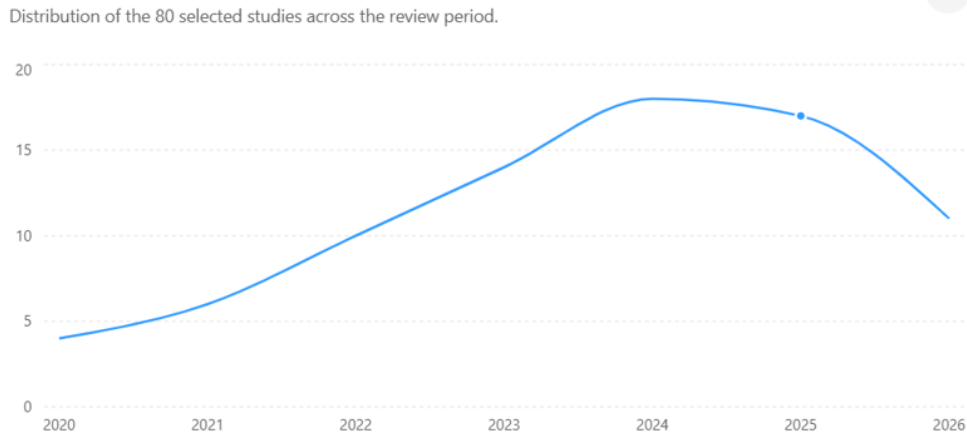
The literature reviewed indicates that higher education in the future will be a space of increasingly intelligent, personalized, collaborative, data-driven, and ethical learning ecosystems. The merging of the four fields of generative AI, social media, adaptive learning, learning analytics and institutional transformation is opening up new pathways and opportunities for innovations in learning, as well as posing new questions on governance, sustainability, wellbeing and responsible technology use. The current trends will offer a basis for understanding the key research gaps and research directions in the future of AI-powered social media learning ecosystems.

4. Results and Analysis

4.1 Publication Trend Analysis

The publication history over the course of the review shows a marked rise in scholarly interest in AI-supported social ecosystems of learning in higher education. The first few years saw a few publications, but there was a dramatic increase in the number of publications after 2022 due to the rise in digital transformation projects and the appearance of new technologies based on generative AI. The most significant number of studies occurred between 2024 and 2026, highlighting the increasing academic and institutional focus on the use of Artificial Intelligence in innovative applications in education, personalized learning, learning analytics, and learning in the context of social media.

Figure 2. Publication Trends of Selected Studies (2020–2026)

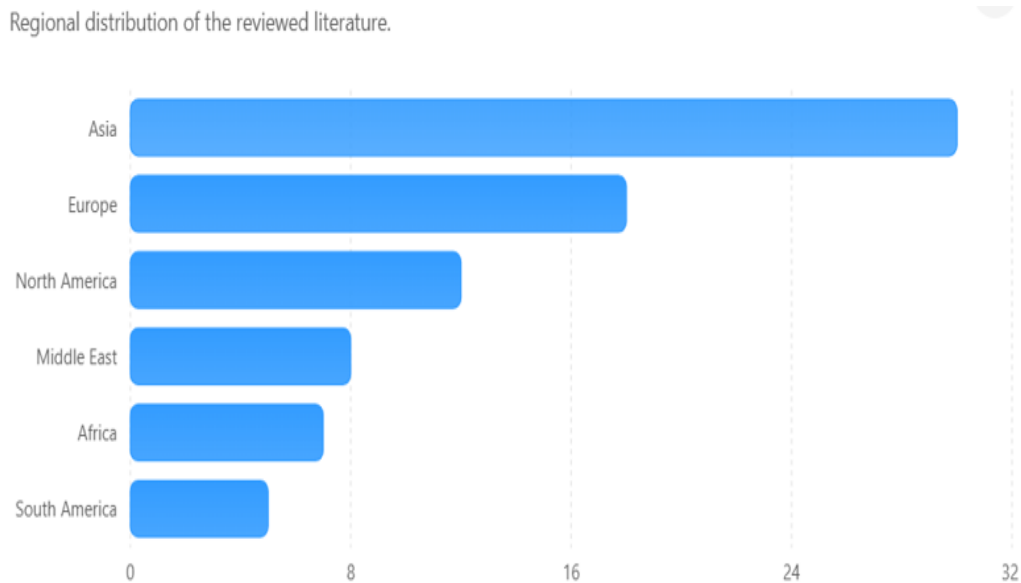


The figure shows a growing quantity of research starting from 2020. Over half of the selected studies were published between 2024 and 2026, highlighting the growing momentum and interest in generative AI, learning analytics, digital learning ecosystems, and the role of AI in educational transformation.

4.2 Country Distribution of Selected Studies

The spatial distribution of the reviewed studies shows that studies on AI-driven learning ecosystems are concentrated in areas where digital infrastructure is well developed, and investments in educational technology are important. Most studies were based in the Asia and Europe, and few are from Africa and South America.

Figure 3. Country/Region Distribution of Selected Studies



The highest number of publications came from Asian countries, which underlines a high level of AI technology uptake in the education sector. There were also significant contributions from studies in Europe and North America that emphasized learning analytics, AI governance and innovation in education. Fewer studies were found in Africa and South America, suggesting potential areas for future research in these areas.

4.3 Methodological Distribution

There is variation in methodologies across the selected studies which are apparent in the analysis of the research methodologies. There is a preponderance of quantitative approaches, with other approaches such as systematic reviews, conceptual studies and qualitative investigations also playing a significant role in the body of knowledge.

Figure 4. Methodological Distribution of Selected Studies

Research methods employed across the reviewed literature.

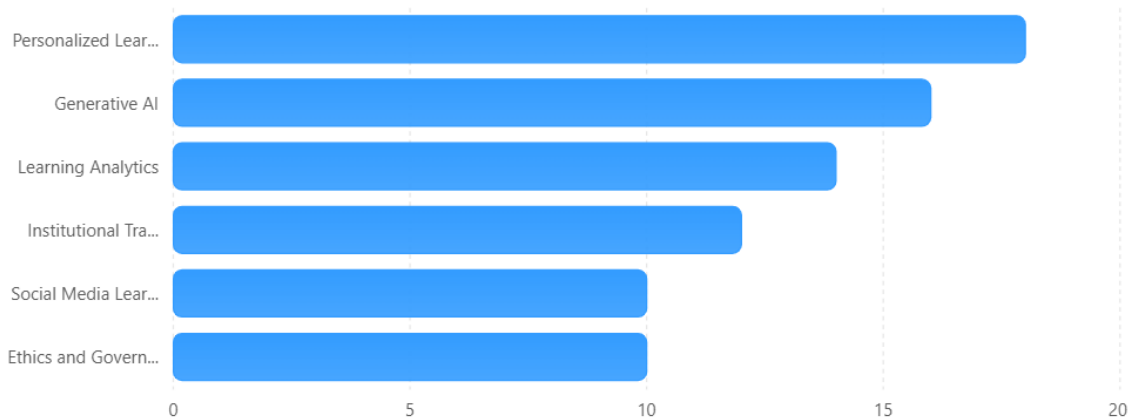


The quantitative studies are the most common research design, underscoring the focus on empirical assessment of the adoption of AI, learner engagement, and educational outcomes. Due to the dynamic nature of the field of AI in higher education, and the increasing demand for evidence synthesis, the volume of systematic reviews is considerable. But there are comparatively few mixed-method and longitudinal studies that suggest possible gaps in the literature.

The literature reviewed was analysed to identify the six dominant research themes. The most common focus of investigation was personalized learning and generative AI, followed by learning analytics, institutional transformation, learning through social media, and ethical governance.

Figure 5. Thematic Distribution of Selected Studies

Major themes identified from the 80 selected studies.



Thematic analysis reveals that, in terms of research, personalized learning and generative AI are the two areas of greatest focus in AI-supported higher education. There has also been a substantial increase in learning analytics and

institutional transformation research. However, social media learning ecosystems and ethical governance are still under-researched areas that warrant further scholarly research.

5. Implications of the Study

This systematic review provides important theoretical, practical, pedagogical and policy implications for stakeholders involved in higher education. The review aggregates evidence from research published from 2020 to 2026 to make a contribution to the understanding of the impact of Artificial Intelligence (AI) and social media technologies on the current learning ecosystem.

5.1 Theoretical Implications

The study contributes to the existing knowledge in the field by connecting the scattered research of Artificial Intelligence, social media learning, personalized education, learning analytics, and digital transformation in a broader perspective of an educational ecosystem. The results show that AI should not just be seen as a technological innovation but as part of the broader picture of interconnected learning environments that involve learners, teachers, institutions, digital environments, and governance mechanisms. The study is a part of the emerging discourse on the models of education based on ecosystems, focusing on the complexity of technological, pedagogical, social and institutional aspects of higher education.

Moreover, the review builds on the ongoing debates about learner-centred education, showcasing the potential of AI-enabled personalisation, adaptive learning platforms, and intelligent analytics in promoting individualised learning experiences. The discovery of emerging topics and research gaps also offers a conceptual basis for future research and theoretical development on AI-powered education ecosystems.

5.2 Practical Implications for Higher Education Institutions

The results offer valuable insights to higher education institutions in their efforts to incorporate AI technologies into their educational and administrative practices. AI learning analytics, adaptive learning systems, intelligent tutoring platforms, and generative AI tools are all potential solutions that can be used by universities to improve student engagement, academic achievement, and accessibility in education. The review indicates that, apart from technical infrastructure, it is also imperative to have strategic planning, institutional readiness, faculty training and constant monitoring of the program.

AI-powered social media platforms can also be used to improve collaborative learning, peer interaction, sharing of knowledge, and academic networking, even outside the classroom. Such actions can help build more flexible, inclusive and connected learning environments that can serve the needs of all learners.

5.3 Pedagogical Implications

The review underscores the relevance of the use of AI in pedagogical practices. As AI enters the educational landscape, teachers are being challenged to adjust their teaching methods to fit the new AI-powered learning contexts. The results suggest the potential for AI technologies to assist with personalized teaching, immediate feedback, adaptive testing, and student-centered learning. But implementing this successfully necessitates teachers to manage the capabilities of the technology, pedagogical goals, critical thinking growth and learner autonomy.

The advent of generative AI also requires a rethinking of assessment, learning, and academic integrity policies. To address this growing need, educators need to cultivate AI literacy and adopt creative teaching methods that foster responsible and meaningful usage of AI technologies in higher education.

5.4 Policy and Governance Implications

The implications of AI's growth for higher education pose significant policy and ethical questions about privacy, digital equity, transparency and accountability. The review highlights the importance of having comprehensive institutional and governmental policies that inform responsible adoption of AI. There needs to be a regulatory framework in place to tackle algorithmic bias, data protection, academic integrity and ethical use of AI-generated content.

The results also indicate the need to foster inclusiveness, accessibility, and equal access to AI powered education through governance mechanisms. These are necessary for the positive role technological innovation can play in enhancing the quality of education and social development.

5.5 Implications for Future Research

The research highlights several directions that should be explored in future studies on this topic, such as the continued tracking of AI-supported outcomes, ecosystem-based research on integrating AI and social media into education, human-centred research on the adoption of AI in the teaching and learning process, and cross-cultural research on educational change. The potential of new technologies like emotional artificial intelligence, immersive learning, smart education and blockchain-based learning should also be investigated in future research.

The review provides a comprehensive overview of the opportunities and potential of AI-powered social media learning environments for the higher education sector. But realizing this potential will need coordinated activities between researchers, educators, institutional leaders, policy makers and technology developers to ensure sustainable, responsible and inclusive implementation.

6. Conclusion

Artificial Intelligence has proven to be a game-changer in higher education, impacting teaching, learning, assessment, academic administration, and engagement with learners. Based on the PRISMA framework and literature published from 2020 to 2026, this SLR aimed to integrate and analyze the evidence regarding the development, use, opportunities, barriers, and potential futures of AI-powered social media learning ecosystems in higher education.

The results show that the field is moving beyond the individual use of AI to fully holistic educational ecosystems that feature personalized learning, adaptive teaching, generative AI, learning analytics, collaborative social learning and institutional change. AI technologies are being widely adopted in education to promote learner-centred learning, to boost academic results, to make education more accessible, and to enable data-driven decisions. At the same time, social media has evolved from communication to being significant spaces for collaboration, knowledge sharing, networking and informal learning.

Based on the thematic analysis the main research areas found in the literature were personalized learning, generative AI, learning analytics, institutional transformation, social media learning and ethical governance. Some of these themes are currently being the most studied, and they are gaining more importance in the field of education these days: Generative AI and personalized learning. But the evaluation showed that there are also a number of key challenges that come with using AI in education, such as concerns about plagiarism, privacy, bias, digital inequity, learner dependency, and governance.

The study also reveals that the current research is still dispersed with insufficient integration of the learning possibilities of AI and social media in a common ecosystem framework. The methodological weaknesses, the geographical clustering of research, and the low importance given to the emotional aspects of learning and to the long-term educational consequences of these practices and experiences remain a challenge in building up a broad knowledge base in this area. The limitations indicate the need for more interdisciplinary, longitudinal and ecosystem-based studies.

However, the evidence overall indicates that AI-powered social media learning ecosystems have significant potential to promote the quality, engagement, accessibility and innovation of learning. This potential can only be realized if there is responsible governance, ethical implementation principles, institutional preparedness, faculty preparedness and learner-centred pedagogical approaches.

To sum up, the future of higher education will see an increased role of AI and social media technologies as complementary tools to transform the education landscape for the better, and intelligent, connected, data-driven learning ecosystems will be the ones shaping the future of higher education. With the ongoing developments of these technologies, higher education institutions need to take a balanced approach as well as a responsible one, in which educational benefits are maximized and ethical, social and pedagogical issues are minimized. These will help create sustainable, inclusive and human-centred education ecosystems that can address the 21st century learning needs.

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