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# Artificial Intelligence in Curriculum Development: A Global Systematic Review of Trends, Challenges, and Strategic Directions

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**ABSTRACT**
Artificial Intelligence (AI) is reshaping curriculum development by enabling more personalised, efficient, and responsive learning design. Evidence on its system-level impact, however, remains fragmented across disciplines and educational levels, leaving limited guidance for coherent curriculum decisions. This systematic review synthesises recent scholarship to map trends, implementation challenges, and strategic directions for AI-integrated curriculum development. Following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) protocol, studies were retrieved from Scopus, Web of Science (WoS), and the Education Resources Information Center (ERIC) for the years 2023 to 2025. A total of 779 records were identified, from which 36 high- and moderate-quality studies were included after screening and appraisal. Thematic analysis yielded three domains: (1) curriculum design and integration, indicating movement toward adaptive and ethically aligned frameworks; (2) pedagogical practice and teacher preparation, underscoring the centrality of AI literacy and context-sensitive professional learning; and (3) strategic planning and innovation, highlighting institutional readiness, policy alignment, and equity considerations. While the evidence suggests meaningful potential for curriculum reform, uneven implementation is driven by infrastructure gaps and limited educator capacity. This review consolidates current knowledge and contributes an integrated lens that connects curriculum design logics with governance and ethical safeguards. Practical implications include prioritising teacher AI literacy, formalising institutional readiness assessments, and embedding equity criteria into curriculum decision-making to support responsible and scalable adoption.

**KEYWORDS**
Artificial intelligence; curriculum development; systematic review; pedagogy; educational technology.

## INTRODUCTION

The convergence of Artificial Intelligence (AI) and education has ushered in a transformative shift in curriculum development, reshaping how learning is designed, delivered, and assessed (Harry & Sayudin, 2023; X. Wang et al., 2023). As global education systems adapt to the demands of the 4th Industrial Revolution, the integration of AI technologies into curriculum design is increasingly seen as a strategic necessity rather than a futuristic option. Technologies such as adaptive learning systems, intelligent tutoring platforms, and automated assessment tools have been lauded for their potential to enhance educational effectiveness, promote inclusivity, and foster 21st-century competencies such as creativity, problem-solving, and digital literacy (Holmes & Tuomi, 2022; Kraishan, 2023; Zanca et al., 2021).

Despite this optimistic outlook, scholarly efforts to conceptualise AI's influence on curriculum remain fragmented across disciplines and educational levels (Dai, Liu, & Lim, 2023; Heilala et al., 2023). Many studies concentrate on discrete applications within specific contexts, such as language learning, medical training, or Science, Technology, Engineering, and Mathematics (STEM) education, without offering a comprehensive synthesis of how AI is systemically transforming curriculum development. Moreover, the field continues to grapple with ethical dilemmas such as algorithmic bias, data governance, and the dilution of human agency in AI-mediated learning environments (Holmes et al., 2022; Yu & Yu, 2023).

These gaps underscore the need for a structured review that consolidates recent empirical insights and maps the evolving landscape of AI-integrated curriculum practices. In particular, there is a lack of conceptual clarity regarding how AI is framed within curriculum design logics, for example, constructive alignment and competency-based progression, and how ethical considerations, including transparency, accountability, and equity, intersect with these logics (Holmes et al., 2022; Holmes & Tuomi, 2022). Addressing this conceptual limitation strengthens the theoretical grounding of the field and provides a more coherent lens for interpreting empirical findings.

This systematic literature review therefore seeks to synthesise global trends, identify implementation challenges, and propose strategic directions for the integration of AI in curriculum development. Guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) protocol, the review collates existing evidence and situates it within broader theoretical and ethical debates. Accordingly, it provides a foundation for developing educational frameworks that are technologically advanced, contextually grounded, pedagogically robust, and ethically responsible.

### *Background*

Recent developments in AI have prompted curriculum designers to rethink conventional approaches, particularly in relation to personalisation, competency mapping, and alignment with emerging industry standards. Tavakoli et al. (2022), for instance, introduced a hybrid human-AI model aimed at facilitating personalised pathways in informal learning environments. Similarly, Dzurenda et al. (2024) employed machine learning algorithms and optimisation

techniques to align cybersecurity curricula with the European Cybersecurity Skills Framework. Schleiss et al. (2023) demonstrated how AI-informed collaboration within interdisciplinary curriculum workshops can reduce fragmentation in engineering education. These initiatives reflect a growing interest in competence-oriented and data-driven strategies, although issues of scalability and standardisation remain unresolved.

The integration of generative AI into curriculum adaptation has also gained scholarly attention. Tanweer and Ismail (2024) proposed an adaptive framework designed to foster personalised and inclusive learning through automated content generation. Tariq (2024) highlighted the capacity of large-scale models such as GPT-3 to support flexible curriculum design, especially in higher education contexts. In another study, Padovano and Cardamone (2024) explored the use of semantic AI analysis to guide competency-based curricular structures in industrial engineering programmes. While these approaches offer innovative possibilities, concerns regarding content validity, pedagogical soundness, and ethical oversight continue to limit broader adoption.

Beyond the realm of content design, AI-supported classification systems and learning analytics have been employed to tailor instruction according to learner profiles. Sowmiya et al. (2025) introduced the AI-SCTAM model to evaluate student engagement and adapt instruction in computational thinking. Nattawuttisit and Maneerat (2024) demonstrated the use of deep learning to generate course recommendations aligned with the Thai Qualifications Framework. Hoffman and Budree (2024) leveraged learning style theories to enhance curriculum delivery through AI-based content personalisation. These models have yielded positive outcomes, though their success remains contingent upon the availability and quality of institutional data, which can be inconsistent in low-resource settings.

Healthcare education has also witnessed a growing number of AI-informed curricular innovations. Cai et al. (2025) designed a postgraduate programme on AI in medicine using Kern's six-step model, integrating clinical, ethical, and foundational content. Rufrano and Yeung (2023) applied AI-generated topic maps to support course design based on emerging themes from the life course model. In anaesthesiology, Schroeder and Elkassabany (2024) and Nanda with Grant (2024) documented the use of AI to develop learner-specific modules that enhance procedural competency. Huang (2025) added to this by framing AI literacy as a necessary pillar of medical education. While these developments highlight AI's versatility in healthcare curriculum design, they also reveal gaps in equitable access, especially where digital infrastructure is limited, and in evaluating the long-term impact on clinical performance.

Institutional context plays a critical role in determining the success of AI integration. Abbasi et al. (2025) revealed that institutional support, faculty competence, and administrative expectations were key enablers of curriculum innovation across diverse regions. Piedad (2024) highlighted infrastructural barriers in the Philippines, indicating that even well-intentioned AI-on-Edge deployments face challenges without adequate teacher training and support systems. Meanwhile, James and Maldonado-Molina (2025) proposed a professional training model for

health educators to bridge AI knowledge gaps, especially in non-technical fields. These cases underscore the necessity of context-sensitive curriculum strategies. However, harmonising these efforts with global standards remains elusive, as few studies offer scalable or transferable solutions that work across socio-economic and cultural boundaries.

Several domain-specific curricula have emerged in fields such as cybersecurity, radiology, and history education. Dzurenda et al. (2024) optimised a cybersecurity curriculum using AI-aligned competencies, while Crotty et al. (2024) proposed modular training in medical imaging to support alignment with clinical practices. Alkhulaifat et al. (2023) examined paediatric-specific considerations, and Nichol (1985) provided early insights into AI's potential in history education, focusing on the role of teacher autonomy. Soto and del Pozo (1989) proposed a formal framework to standardise AI curriculum development in engineering programmes. These examples reflect the potential of AI to address specialised content needs. At the same time, they illustrate how the current literature remains heavily fragmented across disciplinary lines.

Other studies have addressed the methodologies behind curriculum development in the AI era. Takeno et al. (2023) introduced an AI-based programming curriculum for after-school learners and noted varied impacts depending on prior learner experience. Tavakoli et al. (2022) employed collaborative AI platforms to co-create learning objectives between educators and learners. Abbasi et al. (2025) noted the role of academic leadership in driving systemic change, while Lee and Cho (2024) developed an AI curriculum for intelligent systems based on comparative benchmarks. These efforts suggest that AI may play a role as a tool for content generation and as a collaborative agent in curriculum design. The success of such models, however, remains highly dependent on institutional readiness, leadership commitment, and pedagogical alignment.

Despite wide-ranging studies, key gaps remain. Many fail to assess long-term learning outcomes or the scalability of AI in under-resourced settings. Ethical issues such as data privacy, transparency, and content accountability are often marginalised. Moreover, integrated frameworks for interdisciplinary or cross-cultural curriculum design are rare. Beyond descriptive applications, AI's influence on curriculum can be articulated through established design logics. From a constructive-alignment perspective, AI-enabled personalisation reshapes how intended outcomes, learning activities, and assessments are coherently tied together to support demonstrable performance. Competency-based approaches further position AI as a mechanism for monitoring progression toward clearly defined competencies rather than seat-time accumulation. In technology integration, the TPACK lens clarifies how AI tools mediate the interplay between pedagogy and content, affecting not only delivery but the epistemic framing of tasks and evidence. Together, these lenses explain theoretically how AI reconfigures curricular rationales rather than merely augmenting delivery, thereby addressing the gap highlighted by the reviewer (Alharbi, 2024; Pereira et al., 2024; Schmid et al., 2024).

***Research Questions***

This review was guided by research questions constructed using the PICo framework, which is suited for qualitative evidence synthesis (Lockwood et al., 2015). The elements include:

- Population (P): Educators, curriculum designers, and policy stakeholders.
- Interest (I): Integration and application of AI in curriculum development.
- Context (Co): Diverse educational settings globally, encompassing formal and non-formal institutions.

The PICo framework was selected as it provides a structured basis for formulating questions that capture the target population and the contextual variability in which curriculum decisions occur. This ensures that the review addresses curriculum design logics, pedagogical practices, and institutional strategies in a coherent and systematic manner.

Based on these elements, the review addresses the following questions:

1. In what ways has artificial intelligence shaped curriculum design and content structuring across diverse educational contexts?
2. What challenges and enabling strategies have been reported in the adoption of AI for pedagogical practices and teacher preparation?
3. How are institutions and policy frameworks aligning curriculum planning with AI-driven transformations in academic requirements and workforce demands?

These questions structured the review protocol and directed the thematic synthesis, which subsequently generated the three analytical domains discussed in the findings.

## MATERIALS AND METHODS

This review followed the PRISMA protocol (Page et al., 2021), which supports transparency, rigour, and bias reduction in systematic reviews. Its structured framework enhances the credibility of findings, especially when drawing from evidence-based studies. The databases Scopus, Web of Science (WoS), and Education Resources Information Center (ERIC) were selected for their broad coverage and academic reliability, ensuring access to high-quality and relevant literature.

The PRISMA process involved four main phases. During identification, relevant studies were retrieved using well-defined search strategies. Screening was then conducted to remove duplicates and clearly irrelevant records. The eligibility phase focused on assessing the thematic relevance and methodological alignment of the remaining studies. Finally, in the data extraction stage, key findings and details were systematically recorded. This structured process was also directly aligned to the research questions, ensuring that each filtering stage contributed to clarifying how AI influences curriculum design, pedagogical practice, and institutional strategies. This structured procedure ensured methodological integrity and strengthened the review's contribution to both theoretical and applied discussions in AI and curriculum development.

**Identification**

This initial phase involved retrieving literature from three major databases: Scopus, WoS, and ERIC, selected for their strong indexing in education and curriculum studies. A predefined keyword strategy targeting themes such as artificial intelligence, curriculum development, pedagogy, and educational innovation was applied. The search yielded 363 records from Scopus, 218 from WoS, and 198 from ERIC, totalling 779 articles. Full search parameters for each database are outlined in Table 1.

**Table 1.**

*The search string*

| DATABASE | SEARCH STRING |
|---|---|
| **Scopus** | TITLE-ABS-KEY ( ( “artificial intelligence” OR ai ) AND “curriculum development” ) AND ( LIMIT-TO ( PUBYEAR , 2023 ) OR LIMIT-TO ( PUBYEAR , 2024 ) OR LIMIT-TO ( PUBYEAR , 2025 ) ) AND ( LIMIT-TO ( DOCTYPE , “ar” ) ) AND ( LIMIT-TO ( PUBSTAGE , “final” ) ) AND ( LIMIT-TO ( SRCTYPE , “j” ) ) AND ( LIMIT-TO ( LANGUAGE , “English” ) ) AND ( LIMIT-TO ( SUBJAREA , “SOCI” ) ) AND ( LIMIT-TO ( OA , “all” ) ) **Date of Access: May 2025** |
| **WoS** | ( “artificial intelligence” OR ai ) AND “curriculum development” (All Fields) and 2025 or 2024 or 2023 (Publication Years) and Article (Document Types) and English (Languages) and Open Access and 2025 or 2024 or 2023 (Publication Years) and Article (Document Types) and Education Educational Research (Web of Science Categories) and English (Languages) and Education Educational Research (Research Areas) and All Open Access (Open Access) **Date of Access: May 2025** |
| **ERIC** | ( “artificial intelligence” OR ai ) AND “curriculum development” naepubyearmin:2023 pubyearmax:2025 **Date of Access: May 2025** |

**Screening**

In the screening phase, all 779 records underwent an initial filtering to remove duplicates and entries clearly irrelevant to the study’s focus. After deduplication, 199 articles remained. Titles and abstracts were then reviewed to ensure alignment with the review’s inclusion criteria, particularly relevance to AI integration within curriculum contexts. This step ensured that only studies with thematic consistency and potential methodological value progressed to the eligibility phase. Details of the inclusion and exclusion criteria are presented in Table 2.

**Table 2.**

*The selection criterion is searching*

| CRITERION | INCLUSION | EXCLUSION |
|---|---|---|
| **Language** | English | Non-English |
| **Timeline** | 2023 – 2025 | < 2023 |
| **Literature Type** | Journal (Article) | Conference, Book, Review |
| **Publication Stage** | Final | In Press |

**Eligibility**

The eligibility phase involved a detailed assessment of 199 articles to ensure alignment with the review objectives. Studies were excluded if they lacked focus on AI integration in curriculum, provided insufficient methodological clarity, or had inaccessible full texts. Articles that met the thematic and technical inclusion criteria proceeded to quality assessment. A total of 61 studies qualified for this stage, as summarised in Table 3 (see appendix).

**Quality of Appraisal**

To evaluate the methodological soundness and conceptual relevance of the included studies, a quality assessment was conducted using the framework by Abouzahra et al. (2020), which aligns with Kitchenham's (2007) review principles. The evaluation used six criteria: clarity of objectives (QA1), relevance (QA2), methodological transparency (QA3), theoretical foundation (QA4), literature comparison (QA5), and identification of limitations (QA6). Each study was rated on a three-point scale, and scores were totalled out of six. A threshold of 3.0 (50 percent) was applied to ensure a minimum quality. To strengthen reliability, two researchers independently conducted the appraisal process, and any discrepancies were discussed until consensus was reached. This inter-rater approach minimised individual bias and increased the consistency of evaluations.

Studies scoring above this were included in the synthesis, while those below were excluded due to insufficient rigour or conceptual clarity. This appraisal framework ensured rigour and established a direct link between the quality of evidence and the capacity to answer the three guiding research questions. As summarised in

Table **4** (see appendix), 36 studies met the criteria and were retained. The remaining 25, which scored 3.0 or below, are presented in italic font in the table to indicate exclusion.

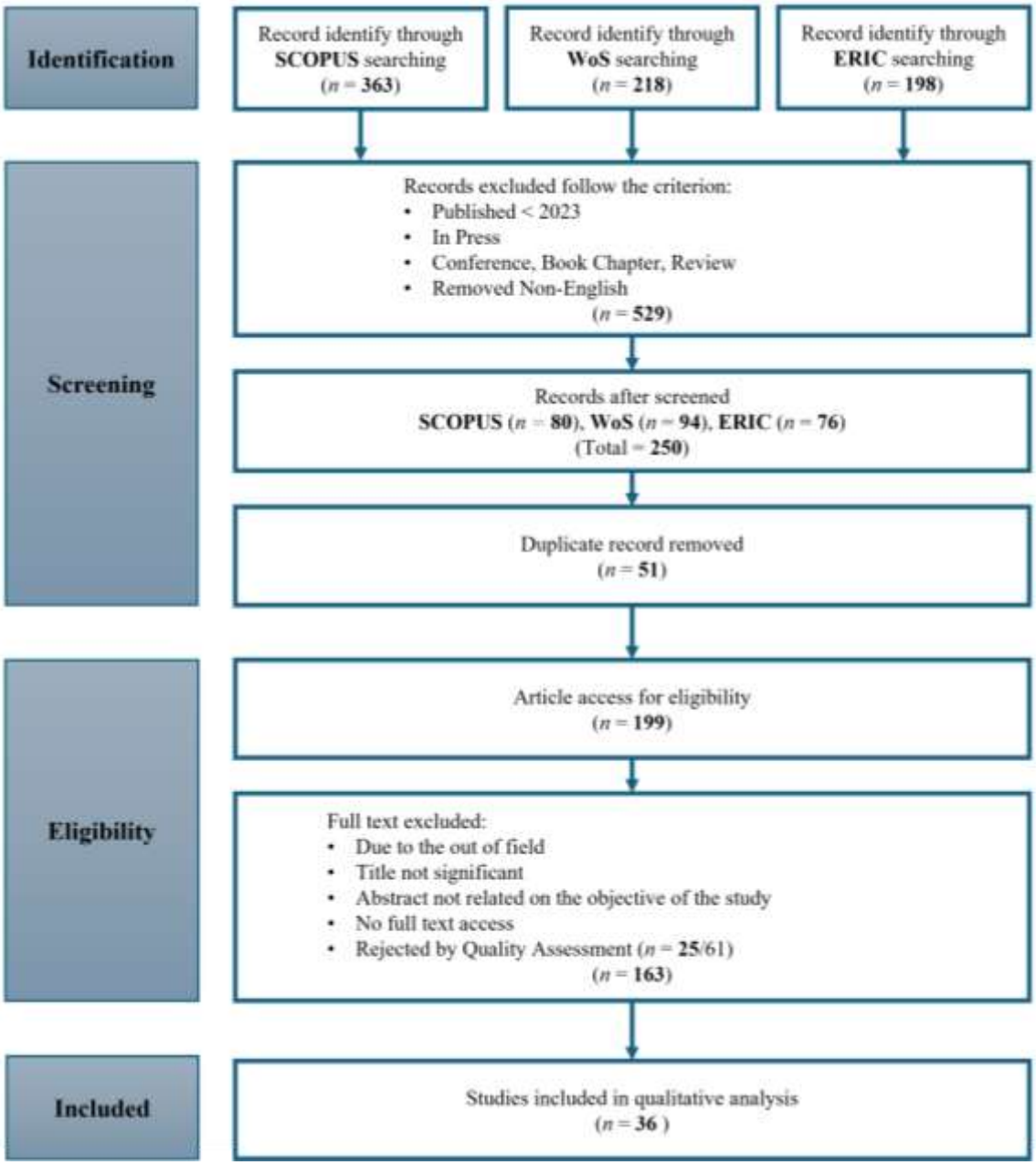
This quality appraisal stage provided a systematic foundation to ensure that only credible, well-structured, and analytically sound studies contributed to the subsequent thematic synthesis. The filtering process enhanced the overall integrity of the review and supported the interpretive strength of its findings. In total, 36 studies that passed the quality threshold were retained for in-depth abstraction and thematic analysis, forming the final dataset used in the next phase of this systematic review.

**Data Abstraction and Analysis**

Following the quality screening, a total of 36 studies were retained for detailed qualitative synthesis. The analysis aimed to uncover patterns, trends, and conceptual insights regarding the integration of artificial intelligence in curriculum development. A two-pronged coding approach was employed, using both inductive and deductive strategies to ensure that the process remained grounded in empirical data while guided by the review's conceptual framework.

**Figure 1.**

*Flow diagram of the proposed searching study*




Each study was independently reviewed and coded with emergent ideas organised into thematic patterns through iterative comparison and consolidation. A standardised data extraction matrix was used to record variables such as educational context, methodological

orientation, focus areas, and AI-related innovations. This structured approach ensured consistency and enhanced the reliability of the findings. To further strengthen validity, the coding process was anchored in the predefined conceptual framework and subjected to iterative cross-checking between reviewers. Reliability was reinforced by applying a double-coding procedure on a subset of studies, with discrepancies resolved through discussion until consensus was reached. The final thematic clusters were then mapped explicitly to the research questions, creating a coherent bridge between the evidence base and the synthesis of trends, challenges, and strategic directions. All methodological steps, from identification and screening to eligibility checking and final inclusion, are transparently presented in the PRISMA flow diagram (Figure 1), providing a clear visual account of the review process and supporting its reproducibility.

## RESULTS AND FINDINGS

The thematic synthesis of 36 high-quality articles identified through systematic review procedures yielded three major themes that characterise how artificial intelligence is being integrated into curriculum development across various educational contexts. These themes are: (1) Curriculum Design and Integration; (2) Pedagogical Practice and Teacher Preparation; and (3) Strategic Planning and Innovation. Each theme reflects distinct trends and challenges in the application of AI within educational design, delivery, and policy frameworks.

### Curriculum Design and Integration

Current developments in AI have significantly redefined the trajectory of curriculum design, prompting educational systems worldwide to recalibrate their learning structures, pedagogical strategies, and institutional capacities. In higher education, the need to shift from traditional content memorization towards fostering critical analysis and higher-order thinking skills has been foregrounded. Bennett and Abusalem (2024), Abusalem and Slimi (2023), and Fernández-Sánchez et al. (2025) advocated for adaptive curriculum frameworks that emphasize creativity, ethics, and personalised learning, especially in response to generative tools such as ChatGPT. Concurrently, Atenas et al. (2024) and Kennedy (2024) stressed the need for embedding inclusive design and data justice principles to promote curriculum equity, aligning AI content with practical business and digital literacy.

The readiness of institutions and educators emerges as a pivotal element in successful AI curriculum integration. Rajapakse et al. (2024) reported that Sri Lankan ICT teachers reported low self-efficacy due to limited emotional resilience and experiential learning regarding AI instruction. Similar concerns were reflected in Alharb's (2024) study in Saudi Arabia, where a notable mismatch between student AI usage and teacher awareness led to challenges in assessment authenticity and curriculum alignment. Kim (2024) contributed a model of teacher-AI collaboration evolving from passive acceptance to active partnership, highlighting the role of institutional culture in shaping teacher agency. Meanwhile, Dai, Liu, Qin, et al. (2023) captured how primary educators in China negotiated AI curriculum co-construction by mediating between national policy directives, university influences, and classroom realities.

Ethical concerns, student anxieties, and AI-induced pedagogical shifts also surfaced as key factors shaping curriculum design. Al-Worafi et al. (2024) observed that while ChatGPT supported educators in syllabus and content development, its limitations in constructing qualitative assessments necessitate cautious integration. In language education, Rosanda et al. (2025) examined robot-assisted instruction, revealing a correlation between learners' attitudes toward AI and their academic engagement. Similarly, Esangbedo et al. (2023) underlined the importance of curriculum alignment with industry needs, especially under Industry 4.0, using AI, patenting, and R&D as mediating structures that influence educational opportunities. The potential erosion of professional autonomy in the face of AI automation was also critically examined by Ghamrawi et al. (2024). The study highlighted how teacher leadership could either expand or regress depending on the nature of AI implementation.

Innovations in content delivery and multimodal engagement with learners have marked another transformative area. Bland (2025) demonstrated that cinematic, AI-generated narratives significantly enhanced student interest and information retention in pharmacology education. Similarly, Weng et al. (2024) noted that primary school students demonstrated improved creativity and self-efficacy through the use of AI-enhanced tools, such as Comic Reflection, particularly in SDG-themed curricula. Kaczorowski et al. (2024) provided insights into AI's role in special education teacher training, including its use in IEP development and case simulation, while Halomoan et al. (2024) examined how school leadership and teacher roles impacted the rollout of the AI-based 'Merdeka' vocational curriculum in Indonesia. In a separate study, Porjazoska Kujundziski et al. (2024) developed an AI-integrated curriculum tailored to the financial and insurance sectors through Erasmus collaborations combining transversal skills with real-world industry demands. Global and policy-level perspectives reinforce the need for sustainable AI integration. Marisa and Susilawati (2024) proposed a model of global education underpinned by AI-enabled personalization, adaptive learning, and real-time tracking. Al-Kadi (2024) addressed the urgency for curriculum reforms in Jordan's media education sector to align with emerging AI ecosystems. Likewise, Nanthawong (2024) proposed enhancing Thai social studies curricula to cultivate digital citizenship and global awareness through AI integration. Amos et al. (2024) validated the application of AI in curriculum evaluation by mapping psychiatric knowledge domains using a self-organizing map derived from the Medline/PubMed dataset, confirming the coherence of AI-generated academic visualizations with expert-derived structures.

Finally, curriculum design models that incorporate emerging technologies have also been explored through empirical analysis. Rosanda et al. (2025) evaluated AI-robot integration in social studies education, while Kennedy (2024) constructed a course in generative AI for business schools that merged ethical AI training with real-world applications such as GANs and VAEs. Collectively, these studies highlight the complex interplay between technological affordances and pedagogical integrity. Successful AI integration into curriculum design hinges

on proactive professional development, inclusive stakeholder collaboration, and pedagogical foresight that anticipates future learning ecologies.

**Pedagogical Practice and Teacher Preparation**

The incorporation of AI into pedagogical practice and teacher preparation has led to notable changes in instructional methods, content adaptation, and educator development. A recurring concern across studies is the lack of prior AI experience among both teachers and students, particularly in non-technical educational environments. Bellas et al. (2023) reported that a two-year AI curriculum was developed for high schools in Europe, specifically designed for students and teachers without AI backgrounds. The teaching units focused on solving practical problems through embedded intelligence using mobile devices, thus providing hands-on exposure while minimizing infrastructure costs. Similarly, Risana et al. (2024) discovered that pharmacy students in India had limited knowledge and experience with AI tools despite expressing positive attitudes toward their educational potential. Ismaili (2024) further emphasized the importance of structured institutional efforts, suggesting that AI integration in Moroccan universities requires comprehensive training initiatives and collaborative learning environments to develop the necessary literacy among educators and learners. Educators have also raised concerns about creativity, data security, and their own readiness when introducing AI tools into instructional settings. Asad et al. (2024) explored teachers' perspectives on the use of ChatGPT in English writing pedagogy and identified key benefits such as personalized feedback and enhanced learner autonomy. However, the study also raised concerns regarding academic dishonesty, the loss of originality in student work, and low digital competence among some educators. Risana et al. (2024) echoed these sentiments, noting that although students demonstrated high interest in generative tools such as ChatGPT and Bard, they lacked awareness of the ethical and pedagogical implications. In response to these concerns, Zhou and Schofield (2024) proposed a conceptual framework for enhancing AI literacy in higher education. The framework aimed to support educators with resources and models that would enable them to confidently integrate AI into teaching while reinforcing responsible usage among students.

The evolving role of teachers in AI-enabled learning environments requires flexible curricular models that accommodate personalized adaptation. Karatas et al. (2025) conducted a national study that demonstrated how teachers modify formal curricula using AI tools. Teachers extended or revised content to better suit student needs with decisions shaped by professional experience and discipline-specific requirements. Kahila et al. (2024) contributed a complementary perspective by documenting co-design projects implemented in Finnish primary schools. In these projects, students were involved in creating their own AI applications, fostering creativity and a deeper understanding of AI concepts. A distributed scaffolding model was applied to support learning, thereby transforming the traditional teacher-student dynamic into a more participatory and constructivist process. The preparation of future educators is increasingly shaped by the need to embed AI literacy into teacher education programs. The research by Bellas et al. (2023), Zhou and Schofield (2024), and Ismaili (2024) highlighted the

need for institutional toolkits, conceptual training models, and practice-based learning to prepare teachers for AI integration. These findings suggest that professional development should focus on technical skills and promoting ethical awareness and pedagogical adaptability. Effective implementation also depends on multi-level collaboration involving academic leaders, faculty members, and students. By aligning instructional strategies with the capabilities of AI technologies, educators can create more engaging and inclusive learning environments that respond to diverse learner profiles.

**Strategic Planning and Innovation**

Emerging trends in artificial intelligence have significantly reshaped strategic planning in education, particularly in the redefinition of curriculum objectives and institutional responses to evolving workforce demands. Rožman et al. (2023) emphasized the strategic significance of aligning educational content with the skills required in the Data and AI Cluster. Their findings highlighted the necessity for stronger integration of statistics, quantitative reasoning, and AI literacy into existing curricula. Similarly, Molina-García et al. (2024) discussed the urgency of embedding competency-based learning frameworks into sports sciences education in Spain. These competencies are seen as foundational to ensure graduate preparedness in a labour market increasingly driven by automation and intelligent systems. Humanika and Radjaban (2024) extended this discourse by highlighting a fluctuating interest in translation careers due to the rise of machine translation, thereby advocating for a comprehensive reform of translation curricula to integrate AI tools and computational approaches.

Incorporating AI into educational planning also necessitates a deeper understanding of students' perceptions and attitudes toward technology. Gunawan et al. (2024) reported that Indonesian nursing students acknowledged the benefits of ChatGPT but remained cautious about its reliability and limitations. This hesitancy reflects a broader tension between AI adoption and professional identity preservation, particularly in fields where human interaction is central. In a similar context, C. Wang et al. (2025) explored the use of ChatGPT in programming courses among Chinese medical students. Their grounded theory analysis revealed that students' willingness to use AI was shaped by personal motivation, environmental influences, and perceived technical utility. These findings suggest that successful strategic planning must integrate AI tools and address the socio-cognitive dimensions that influence user adoption. The innovation potential of AI in education is further demonstrated through experimental models and reflective pedagogical frameworks. Wood and Moss (2024) evaluated the effects of integrating generative AI into a master's-level instructional design course and introduced the AI-ICE framework to measure students' cognitive engagement. Results revealed that while students became more comfortable using generative tools and were aware of ethical issues, their engagement levels were still developing. Chaparro-Banegas et al. (2024) supported this finding by demonstrating that strategic learning activities, such as seminars and workshops, when combined with AI support, could improve students' critical thinking and promote deeper

reflection on complex issues. Both studies advocate for instructional designs that strategically utilize AI for content delivery and to stimulate intellectual growth and ethical discernment.

Taken together, these studies illustrate that innovation in curriculum development and educational planning must be grounded in realistic appraisals of AI capabilities, evolving labour market demands, and the ethical preparedness of learners. A multidimensional strategy that integrates technical skill-building, ethical frameworks, and adaptive pedagogies will be essential for ensuring that educational systems remain both innovative and accountable in the age of artificial intelligence.

## DISCUSSION

The findings from this review highlight the evolving relationship between artificial intelligence and curriculum development, which has grown increasingly prominent across global educational landscapes. Rather than remaining within static, discipline-centred structures, curriculum models are progressively shifting toward dynamic frameworks capable of adapting to technological innovations. Several studies (e.g., PS3, PS17, PS21) illustrate how similar transitions have been observed in other educational contexts, supporting the view that curriculum adaptability is central to organizational resilience in the digital era.

AI integration is driving the reconfiguration of learning pathways and assessment models, reflecting a broader push toward competency-based education. Nonetheless, the pace and nature of implementation differ widely across contexts. For example, studies such as PS1 and PS41 underscore disparities in regional readiness and infrastructural capacity, with some systems facing barriers, including limited access to AI technologies or inadequate teacher training. This supports the concern raised by PS23 and PS38 regarding the systemic gap between AI policy ambitions and practical classroom integration. Comparable findings in related research also indicate that institutional readiness and resource allocation play a decisive role in determining successful AI adoption at the organizational level.

The review also identified pedagogical shifts associated with AI tools. Educators are increasingly leveraging adaptive platforms, chatbots, and generative models to personalise learning and support diverse learners (PS8, PS15, PS27). Despite these opportunities, persistent challenges remain in relation to data privacy, algorithmic bias, and the potential erosion of human agency. These tensions suggest a need for robust ethical frameworks and AI literacy among both educators and learners. Furthermore, AI's influence extends beyond instructional delivery to encompass institutional strategy and governance. Similar concerns have been highlighted in related studies, which emphasise that without strong ethical safeguards and governance structures, organizational practices risk undermining equity and trust in AI-driven education.

The alignment of AI-integrated curricula with future workforce demands has emerged as a critical concern in studies such as PS5, PS31, and PS60. These findings align with curriculum planners to adopt a forward-looking perspective, balancing innovation with inclusivity, equity,

and contextual relevance. Such alignment has direct implications for educational organizations, which must redesign professional development programmes and governance mechanisms to sustain long-term integration of AI.

In sum, while AI presents powerful tools for enhancing educational experiences, its sustainable integration into curriculum systems depends on three interrelated conditions: strategic planning, professional development, and supportive infrastructure. As education systems worldwide continue to engage with AI, ongoing critical inquiry and cross-sector collaboration will be essential to ensure ethical, equitable, and effective adoption.

## CONCLUSION

This systematic review examined the integration of artificial intelligence into curriculum development across global educational contexts, synthesising evidence from 36 high- and moderate-quality studies published between 2023 and 2025. The analysis revealed three dominant themes: curriculum design and integration, pedagogical practice and teacher preparation, and strategic planning with innovation. This reflects the multifaceted impact of AI on education. While AI demonstrates strong potential to enhance curriculum frameworks, teacher readiness, and institutional foresight, its implementation remains uneven due to disparities in infrastructure, policy alignment, and educator capacity.

From a practical perspective, the review underscores the importance of targeted professional development, inclusive curriculum models, and clear policy frameworks to ensure equitable and ethical AI adoption. However, limitations such as the absence of longitudinal data, underrepresentation of certain regions, and inconsistent methodological rigour constrain generalisability. Thus, future research should prioritise long-term evaluations, comparative and cross-cultural studies, and deeper investigation into ethical governance frameworks.

In conclusion, this review offers timely insights into the trajectory of AI-driven curriculum reform, providing a foundation for designing culturally responsive, ethically sound, and pedagogically robust frameworks. Stakeholder collaboration across ministries, universities, and communities will be crucial in guiding the integration of inclusive and sustainable AI in education.

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## APPENDIX

**Table 3.**

*Number and details of Primary Studies Database*

| No. | Author | Title | Year | Journal | Scopus | WoS | ERIC |
|---|---|---|---|---|---|---|---|
| 1. | Nipitpon Nanthawong | A Comparative Analysis of Social Studies Curricula for Enhancing Global Citizenship: A Case Study of New York State, the United States, and Thailand | 2024 | Higher Education Studies | | | / |
| 2. | Rajapakse, C., Ariyarathna, W., & Selvakan, S. | A Self-Efficacy Theory-Based Study on the Teachers' Readiness to Teach Artificial Intelligence in Public Schools in Sri Lanka | 2024 | ACM Transactions on Computing Education | | | / |
| 3. | Bellas, F., Guerreiro-Santalla, S., Naya, M., & Duro, Richard J. | AI Curriculum for European High Schools: An Embedded Intelligence Approach | 2023 | International Journal of Artificial Intelligence in Education | | | / |
| 4. | Yassine Ismaili | AI Literacy and Adaptive Learning in Moroccan Education: Advancing Critical Thinking and Personalized Learning | 2024 | Research on Education and Media | | | / |
| 5. | Ali Abusalem | Artificial Intelligence (AI) and Its Potential Impact on the Future of Higher Education | 2024 | Athens Journal of Education | | | / |
| 6. | Villarino R.T.H. | Artificial Intelligence (AI) integration in Rural Philippine Higher Education: Perspectives, challenges, and ethical considerations | 2025 | International Journal of Educational Research and Innovation | / | / | |
| 7. | Risana, V. U., Shirin, A., Purayil, R. N., Mathew, S. R., Soman, S., Chandran, C. S., & Kiron, S. S. | Artificial Intelligence and Pharmacy Education: A Survey to Assess the Knowledge, Application, and Perspective of B. Pharm. Students from India | 2024 | Discover Education | | | / |
| 8. | Gunawan, J., Aungsuroch, Y., Marzilli, C., Nazliansyah, Chaerani, E., & Jed Montayre | Artificial Intelligence Chatbot as Perceived by Nursing Students: A Qualitative Study | 2024 | SAGE Open | | | / |
| 9. | Kheamparit Khunratchasana | Artificial Intelligence Competence: A Crucial Skill for the Digital Citizens | 2024 | International Education Studies | | | / |

| No. | Author | Title | Year | Journal | Scopus | WoS | ERIC |
|---|---|---|---|---|---|---|---|
| 10. | Jackson P.; Ponath Sukumaran G.; Babu C.; Tony M.C.; Jack D.S.; Reshma V.R.; Davis D.; Kurian N.; John A. | Artificial intelligence in medical education - perception among medical students | 2024 | BMC Medical Education | / | / | |
| 11. | Özmat D.; Akkoyunlu B. | Artificial Intelligence-Assisted Translation in Education: Academic Perspectives and Student Approaches | 2024 | Participatory Educational Research | / | | |
| 12. | Rožman M.; Tominc P.; Vrečko I. | Building skills for the future of work: Students' perspectives on emerging jobs in the Data and AI Cluster through artificial intelligence in education | 2023 | Environment and Social Psychology | / | | |
| 13. | Chaparro-Banegas, N., Mas-Tur, A., & Norat Roig-Tierno | Challenging Critical Thinking in Education: New Paradigms of Artificial Intelligence | 2024 | Cogent Education | | | / |
| 14. | Hui-Chen Lin | ChatGPT as a Life Coach for Professional Identity Formation in Medical Education: A Self-Regulated Learning Perspective | 2024 | Educational Technology & Society | | | / |
| 15. | Asad, M. M., Shahzad, S., Shah, S. H. A., Sherwani, F., & Norah Mansour Almusharraf | ChatGPT as Artificial Intelligence-Based Generative Multimedia for English Writing Pedagogy: Challenges and Opportunities from an Educator's Perspective | 2024 | International Journal of Information and Learning Technology | | | / |
| 16. | Yangyu Xiao | Chinese University Teachers' Engagement with Generative Ai in Different Stages of Foreign Language Teaching: A Qualitative Enquiry through the Prism of ADDIE | 2025 | Education and Information Technologies | | | / |
| 17. | Dai Y.; Liu A.; Qin J.; Guo Y.; Jong M.S.-Y.; Chai C.-S.; Lin Z. | Collaborative construction of artificial intelligence curriculum in primary schools | 2023 | Journal of Engineering Education | / | | / |
| 18. | Atenas J.; Havemann L.; Nerantzi C. | Critical and creative pedagogies for artificial intelligence and data literacy: an epistemic data justice approach for academic practice | 2024 | Research in Learning Technology | / | / | / |
| 19. | Marjorie W. Rowe | Curriculum Inquiry to Strengthen Teacher | 2024 | Rural Educator | | | / |

| No. | Author | Title | Year | Journal | Scopus | WoS | ERIC |
|---|---|---|---|---|---|---|---|
| | | Preparation for Supporting Multilingual Learners in Rural Settings | | | | | |
| 20. | Kyungbin Kwon | Designing an Inclusive Artificial Intelligence (AI) Curriculum for Elementary Students to Address Gender Differences with Collaborative and Tangible Approaches | 2024 | Journal of Educational Computing Research | | | / |
| 21. | Zhou, X., & Lilian Schofield | Developing a Conceptual Framework for Artificial Intelligence (AI) Literacy in Higher Education | 2024 | Journal of Learning Development in Higher Education | | | / |
| 22. | Weng, C., Kassaw, K., Tsai, P.-S., & Tsai-Ju Lee | Does Scratch Animation for Sustainable Development Goals (SDGs) with AI-Comics Impact on Student Empathy, Self-Efficacy, Scriptwriting, and Animation Skills? | 2024 | Education and Information Technologies | | | / |
| 23. | Liu, W; Huang, RA; Wang, J; Chen, YH; Ohashi, T; Li, BW; Liu, YY; Qiu, D; Yu, RL; Zhang, JJ; Al Mahmud, A; Leifer, L | Empathy Design Thinking: cultivating creative minds in primary education | 2024 | Frontiers in Education | | / | |
| 24. | John Kaczorowski | Early Adopters: Navigating AI Integration in Special Education Teacher Preparation | 2024 | Journal of Special Education Preparation | | | / |
| 25. | Mike Douse | Educational Planning and Artificial Intelligence | 2024 | Educational Planning | | | / |
| 26. | Bland T. | Enhancing Medical Student Engagement Through Cinematic Clinical Narratives: Multimodal Generative AI–Based Mixed Methods Study | 2025 | JMIR Medical Education | / | / | |
| 27. | Wood, D., & Scott H. Moss | Evaluating the Impact of Students' Generative AI Use in Educational Contexts | 2024 | Journal of Research in Innovative Teaching & Learning | | | / |
| 28. | Bruckhaus A.A.; Bennett A.; Brawer-Cohen M.; Sinclair M.; Ramirez-De La Cruz G.; Ragusa G.; Duncan D. | Evaluation of students' digital literacy through an immersive university-high school collaboration | 2024 | Frontiers in Education | / | | |
| 29. | Wang, C., Xiao, C. Q., Zhang, X. J., Zhu, Y. | Exploring medical students' intention to use | 2025 | BMC Medical Education | | / | |

| No. | Author | Title | Year | Journal | Scopus | WoS | ERIC |
|---|---|---|---|---|---|---|---|
| | Y., Chen, X. Q., Li, Y. L., & Qi, H. Y. | of ChatGPT from a programming course: a grounded theory study in China | | | | | |
| 30. | Veena Prachagool | Exploring Perspectives of Teacher Students toward Generative AI Technologies | 2024 | International Education Studies | | | / |
| 31. | Ghamrawi N.; Shal T.; Ghamrawi N.A.R. | Exploring the impact of AI on teacher leadership: regressing or expanding? | 2024 | Education and Information Technologies | / | / | / |
| 32. | Al-Kadi A.B. | Future of Jordanian traditional media in light of AI: A qualitative study | 2024 | Journal of Infrastructure, Policy and Development | / | | |
| 33. | Laura K. Rees | Generative AI as a Catalyst to Elevate School Health Education | 2024 | Journal of Physical Education, Recreation & Dance | | | / |
| 34. | Hira Zahid | Generative Artificial Intelligence (ChatGPT-4) and Social Media Impact on Academic Performance and Psychological Well-Being in China's Higher Education | 2025 | European Journal of Education | | | / |
| 35. | Marisa S.; Gunawan; Susilawati E. | Global Education Development Plan to Build Sustainable Education Based on Artificial Intelligence | 2024 | Qubahan Academic Journal | / | | |
| 36. | Ahmed A.-B.; King B.D.; Hiran K.K.; Dadhich M.; Malcalm E. | Half a Decade of Artificial Intelligence in Education in Africa: Trends, Opportunities, Challenges and Future Directions | 2025 | Journal of Engineering Education Transformations | / | | |
| 37. | Petridou E.; Lao L. | Identifying challenges and best practices for implementing AI additional qualifications in vocational and continuing education: a mixed methods analysis | 2024 | International Journal of Lifelong Education | / | / | / |
| 38. | Halomoan H.; Hakiki M.; Ramadhan M.A.; Hidayah Y.; Fakhri J.; Aljamaliah S.N.M.; Hamid M.A. | Integrating Principal Leadership and Teacher Roles with AI-Based 'Merdeka' Curriculum Innovation: The Quantitative Research | 2024 | TEM Journal | / | / | |
| 39. | Abd-Alrazaq A.; AlSaad R.; Alhuwail D.; Ahmed A.; Healy P.M.; Latifi S.; Aziz S.; | Large Language Models in Medical Education: Opportunities, Challenges, and Future Directions | 2023 | JMIR Medical Education | / | / | |

| No. | Author | Title | Year | Journal | Scopus | WoS | ERIC |
|---|---|---|---|---|---|---|---|
| | Damseh R.; Alrazak S.A.; Sheikh J. | | | | | | |
| 40. | Jinhee Kim | Leading Teachers' Perspective on Teacher-AI Collaboration in Education | 2024 | Education and Information Technologies | | | / |
| 41. | Konstantinos Pagkratis | Learning Outcomes for the Future: How STEM Education Promotes Sustainable Development, Innovation and Green Skills for Young Adults in Germany | 2024 | Studies in the Education of Adults | | | / |
| 42. | Lester, James | Lessons Learned for AI Education with Elementary Students and Teachers | 2023 | International Journal of Artificial Intelligence in Education | | | / |
| 43. | Sharma, Umesh | Measuring Teachers' Attitudes and Intentions towards Inclusion: Portuguese Validation of Attitudes to Inclusion Scale (AIS) and Intention to Teach in Inclusive Classroom Scale (ITICS) | 2023 | European Journal of Special Needs Education | | | / |
| 44. | Alharbi W. | Mind the Gap, Please! Addressing the Mismatch Between Teacher Awareness and Student AI Adoption in Language Education within Higher Education | 2024 | International Journal of Computer-Assisted Language Learning and Teaching | / | / | / |
| 45. | Fernández-Sánchez, A., Lorenzo-Castiñeiras, J. J., & Sánchez-Bello, A. | Navigating the Future of Pedagogy: The Integration of AI Tools in Developing Educational Assessment Rubrics | 2025 | European Journal of Education | | | / |
| 46. | Kahila, J., Vartiainen, H., Tedre, M., Arkko, E., Lin, A., Pope, N., Jormanainen, I., & Teemu Valtonen | Pedagogical Framework for Cultivating Children's Data Agency and Creative Abilities in the Age of AI | 2024 | Informatics in Education | | | / |
| 47. | Khan, Mohammad Shoeb | Prospects of Autonomous Vehicle Learning Kits in Education Systems | 2023 | Information Systems Education Journal | | | / |
| 48. | Molina-García N.; González-Serrano M.H.; Ordiñana-Bellver D.; Baena-Morales S. | Redefining Education in Sports Sciences: A Theoretical Study for Integrating Competency-Based Learning for Sustainable Employment in Spain | 2024 | Social Sciences | / | / | |

| No. | Author | Title | Year | Journal | Scopus | WoS | ERIC |
|---|---|---|---|---|---|---|---|
| 49. | Karatas, F., Eriçok, B., & Lokman Tanrikulu | Reshaping Curriculum Adaptation in the Age of Artificial Intelligence: Mapping Teachers' AI-Driven Curriculum Adaptation Patterns | 2025 | British Educational Research Journal | | | / |
| 50. | Rosanda, V., Bratko, I., Gacnik, M., Podpecan, V., & Istenic, A. | Robot NAO Integrated Lesson vs. Traditional Lesson: Measuring Learning Outcomes on the Topic of "Societal Change" and the Mediating Effect of Students' Attitudes | 2025 | British Journal of Educational Technology | | | / |
| 51. | Humanika, E. S., & R. Yohanes Radjaban | Shaping the Future of Translation Careers: Student Interest and the Need for Curriculum Reform in the AI Era | 2024 | English Language Teaching Educational Journal | | | / |
| 52. | Luxin Chen | Shaping the Future: How Robot Programming Education Changes the Attitudes of Robotics among Rural Primary School Students in a Developing Country | 2025 | Education and Information Technologies | | | / |
| 53. | Kyungbin Kwon | Tangible Computing Tools in AI Education: Approach to Improve Elementary Students' Knowledge, Perception, and Behavioral Intention towards AI | 2024 | Education and Information Technologies | | | / |
| 54. | Eric Kennedy | Teaching AI in Business Schools: A Pathway to Future-Ready Graduates | 2024 | Journal of Instructional Pedagogies | | | / |
| 55. | Slimi, Zouhaier | The Impact of Artificial Intelligence on Higher Education: An Empirical Study | 2023 | European Journal of Educational Sciences | | | / |
| 56. | Esangbedo C.O.; Zhang J.; Esangbedo M.O.; Kone S.D.; Xu L. | The role of industry-academia collaboration in enhancing educational opportunities and outcomes under the digital driven Industry 4.0 | 2024 | Journal of Infrastructure, Policy and Development | / | / | |
| 57. | Al-Worafi Y.M.; Goh K.W.; Hermansyah A.; Tan C.S.; Ming L.C. | The Use of ChatGPT for Education Modules on Integrated Pharmacotherapy of Infectious Disease: Educators' Perspectives | 2024 | JMIR Medical Education | / | / | |

| No. | Author | Title | Year | Journal | Scopus | WoS | ERIC |
|---|---|---|---|---|---|---|---|
| 58. | Padovano A.; Cardamone M. | Towards human-AI collaboration in the competency-based curriculum development process: The case of industrial engineering and management education | 2024 | Computers and Education: Artificial Intelligence | / | | |
| 59. | Kujundziski, AP; Domazet, E; Kamberaj, H; Rahmani, D; Feta, AA; Valverde, FL; Rojas, SG; Petlenkov, E; Vassiljeva, K; Stajduhar, I; Hagen, T; Gradisek, A; Zidansek, A | Transversal skills in applied Artificial Intelligence - the case of the financial sector | 2024 | E-Mentor | | / | |
| 60. | Jaiswal K.; Kuzminykh I.; Modgil S. | Understanding the skills gap between higher education and industry in the UK in artificial intelligence sector | 2025 | Industry and Higher Education | / | / | |
| 61. | Amos A.J.; Lee K.; Gupta T.S.; Malau-Aduli B.S. | Validating the knowledge represented by a self-organizing map with an expert-derived knowledge structure | 2024 | BMC Medical Education | / | / | |

**Table 4.**

*Quality Assessment of Selected Studies Based on Systematic Review Criteria (QA1–QA6)*

| Primary Study | Title | QA1 | QA2 | QA3 | QA4 | QA5 | QA6 | Total Mark | Percentage (%) |
|---|---|---|---|---|---|---|---|---|---|
| PS1 | A Comparative Analysis of Social Studies Curricula for Enhancing Global Citizenship: A Case Study of New York State, the United States, and Thailand | 1 | 0.5 | 1 | 1 | 1 | 0 | 4.5 | 75.0 |
| PS2 | A Self-Efficacy Theory-Based Study on the Teachers' Readiness to Teach Artificial Intelligence in Public Schools in Sri Lanka | 1 | 0.5 | 1 | 1 | 0 | 0 | 3.5 | 58.3 |
| PS3 | AI Curriculum for European High Schools: An Embedded Intelligence Approach | 1 | 0.5 | 1 | 1 | 0 | 0 | 3.5 | 58.3 |
| PS4 | AI Literacy and Adaptive Learning in Moroccan Education: Advancing Critical Thinking and Personalized Learning | 0 | 0.5 | 1 | 0.5 | 1 | 0 | 3 | 50.0 |

| Primary Study | Title | QA1 | QA2 | QA3 | QA4 | QA5 | QA6 | Total Mark | Percentage (%) |
|---|---|---|---|---|---|---|---|---|---|
| PS5 | Artificial Intelligence (AI) and Its Potential Impact on the Future of Higher Education | 1 | 0.5 | 1 | 0.5 | 1 | 0 | 4 | 66.7 |
| *PS6* | *Artificial Intelligence (AI) integration in Rural Philippine Higher Education: Perspectives, challenges, and ethical considerations* | *0* | *0.5* | *1* | *0.5* | *0* | *0* | *2* | *33.3* |
| PS7 | Artificial Intelligence and Pharmacy Education: A Survey to Assess the Knowledge, Application, and Perspective of B. Pharm. Students from India | 1 | 0.5 | 1 | 0.5 | 0 | 0 | 3 | 50.0 |
| PS8 | Artificial Intelligence Chatbot as Perceived by Nursing Students: A Qualitative Study | 1 | 0.5 | 1 | 0.5 | 0 | 1 | 4 | 66.7 |
| *PS9* | *Artificial Intelligence Competence: A Crucial Skill for the Digital Citizens* | *0* | *0.5* | *1* | *0.5* | *0* | *0* | *2* | *33.3* |
| *PS10* | *Artificial intelligence in medical education - perception among medical students* | *0* | *1* | *1* | *0.5* | *0* | *0* | *2.5* | *41.7* |
| *PS11* | *Artificial Intelligence-Assisted Translation in Education: Academic Perspectives and Student Approaches* | *1* | *1* | *0* | *0.5* | *0* | *0* | *2.5* | *41.7* |
| PS12 | Building skills for the future of work: Students' perspectives on emerging jobs in the Data and AI Cluster through artificial intelligence in education | 0 | 1 | 1 | 0.5 | 1 | 0 | 3.5 | 58.3 |
| PS13 | Challenging Critical Thinking in Education: New Paradigms of Artificial Intelligence | 1 | 0.5 | 1 | 0.5 | 1 | 0 | 4 | 66.7 |
| *PS14* | *ChatGPT as a Life Coach for Professional Identity Formation in Medical Education: A Self-Regulated Learning Perspective* | *0* | *1* | *1* | *0.5* | *0* | *0* | *2.5* | *41.7* |
| PS15 | ChatGPT as Artificial Intelligence-Based Generative Multimedia for English Writing Pedagogy: Challenges and Opportunities from an Educator's Perspective | 1 | 1 | 1 | 0.5 | 1 | 0 | 4.5 | 75.0 |
| *PS16* | *Chinese University Teachers' Engagement with Generative Ai in Different Stages of Foreign Language Teaching: A Qualitative Enquiry through the Prism of ADDIE* | *0* | *0.5* | *1* | *0.5* | *0* | *0* | *2* | *33.3* |
| PS17 | Collaborative construction of artificial intelligence curriculum in primary schools | 1 | 0.5 | 1 | 1 | 0 | 0 | 3.5 | 58.3 |
| PS18 | Critical and creative pedagogies for artificial intelligence and data | 1 | 0.5 | 1 | 1 | 1 | 0 | 4.5 | 75.0 |

| Primary Study | Title | QA1 | QA2 | QA3 | QA4 | QA5 | QA6 | Total Mark | Percentage (%) |
|---|---|---|---|---|---|---|---|---|---|
| | literacy: an epistemic data justice approach for academic practice | | | | | | | | |
| *PS19* | *Curriculum Inquiry to Strengthen Teacher Preparation for Supporting Multilingual Learners in Rural Settings* | *0* | *1* | *0* | *1* | *0* | *0* | *2* | *33.3* |
| *PS20* | *Designing an Inclusive Artificial Intelligence (AI) Curriculum for Elementary Students to Address Gender Differences with Collaborative and Tangible Approaches* | *0* | *1* | *1* | *0.5* | *0* | *0* | *2.5* | *41.7* |
| PS21 | Developing a Conceptual Framework for Artificial Intelligence (AI) Literacy in Higher Education | 1 | 0.5 | 1 | 1 | 1 | 0 | 4.5 | 75.0 |
| PS22 | Does Scratch Animation for Sustainable Development Goals (SDGs) with AI-Comics Impact on Student Empathy, Self-Efficacy, Scriptwriting, and Animation Skills? | 1 | 1 | 1 | 0.5 | 0 | 0 | 3.5 | 58.3 |
| PS23 | Early Adopters: Navigating AI Integration in Special Education Teacher Preparation | 1 | 0.5 | 1 | 0.5 | 0 | 0 | 3 | 50.0 |
| *PS24* | *Educational Planning and Artificial Intelligence* | *0* | *0.5* | *0* | *0.5* | *0* | *1* | *2* | *33.3* |
| *PS25* | *Empathy Design Thinking: cultivating creative minds in primary education* | *0* | *0.5* | *1* | *1* | *0* | *0* | *2.5* | *41.7* |
| PS26 | Enhancing Medical Student Engagement Through Cinematic Clinical Narratives: Multimodal Generative AI–Based Mixed Methods Study | 1 | 0.5 | 1 | 1 | 0 | 0 | 3.5 | 58.3 |
| PS27 | Evaluating the Impact of Students' Generative AI Use in Educational Contexts | 1 | 0.5 | 1 | 1 | 0 | 1 | 4.5 | 75.0 |
| *PS28* | *Evaluation of students' digital literacy through an immersive university-high school collaboration* | *0* | *1* | *1* | *0.5* | *0* | *0* | *2.5* | *41.7* |
| PS29 | Exploring medical students' intention to use of ChatGPT from a programming course: a grounded theory study in China | 1 | 0.5 | 1 | 0.5 | 0 | 0 | 3 | 50.0 |
| *PS30* | *Exploring Perspectives of Teacher Students toward Generative AI Technologies* | *0* | *0.5* | *0* | *0.5* | *0* | *0* | *1* | *16.7* |
| PS31 | Exploring the impact of AI on teacher leadership: regressing or expanding? | 1 | 1 | 1 | 0.5 | 0 | 0 | 3.5 | 58.3 |
| PS32 | Future of Jordanian traditional media in light of AI: A qualitative study | 1 | 0.5 | 1 | 1 | 0 | 0 | 3.5 | 58.3 |

| Primary Study | Title | QA1 | QA2 | QA3 | QA4 | QA5 | QA6 | Total Mark | Percentage (%) |
|---|---|---|---|---|---|---|---|---|---|
| *PS33* | *Generative AI as a Catalyst to Elevate School Health Education* | *0* | *0.5* | *1* | *0.5* | *0* | *0* | *2* | *33.3* |
| *PS34* | *Generative Artificial Intelligence (ChatGPT-4) and Social Media Impact on Academic Performance and Psychological Well-Being in China's Higher Education* | *0* | *0.5* | *0* | *1* | *0* | *0* | *1.5* | *25.0* |
| PS35 | Global Education Development Plan to Build Sustainable Education Based on Artificial Intelligence | 1 | 0.5 | 1 | 0.5 | 0 | 0 | 3 | 50.0 |
| *PS36* | *Half a Decade of Artificial Intelligence in Education in Africa: Trends, Opportunities, Challenges and Future Directions* | *1* | *0.5* | *0* | *1* | *0* | *0* | *2.5* | *41.7* |
| *PS37* | *Identifying challenges and best practices for implementing AI additional qualifications in vocational and continuing education: a mixed methods analysis* | *0* | *1* | *1* | *0.5* | *0* | *0* | *2.5* | *41.7* |
| PS38 | Integrating Principal Leadership and Teacher Roles with AI-Based 'Merdeka' Curriculum Innovation: The Quantitative Research | 1 | 0.5 | 1 | 1 | 0 | 0 | 3.5 | 58.3 |
| *PS39* | *Large Language Models in Medical Education: Opportunities, Challenges, and Future Directions* | *0* | *0.5* | *1* | *0.5* | *0* | *0* | *2* | *33.3* |
| PS40 | Leading Teachers' Perspective on Teacher-AI Collaboration in Education | 1 | 0.5 | 1 | 1 | 0 | 0 | 3.5 | 58.3 |
| *PS41* | *Learning Outcomes for the Future: How STEM Education Promotes Sustainable Development, Innovation and Green Skills for Young Adults in Germany* | *0* | *1* | *0* | *1* | *0* | *0* | *2* | *33.3* |
| *PS42* | *Lessons Learned for AI Education with Elementary Students and Teachers* | *0* | *0.5* | *1* | *1* | *0* | *0* | *2.5* | *41.7* |
| *PS43* | *Measuring Teachers' Attitudes and Intentions towards Inclusion: Portuguese Validation of Attitudes to Inclusion Scale (AIS) and Intention to Teach in Inclusive Classroom Scale (ITICS)* | *0* | *0.5* | *0* | *0.5* | *0* | *0* | *1* | *16.7* |
| PS44 | Mind the Gap, Please! Addressing the Mismatch Between Teacher Awareness and Student AI Adoption in Language Education within Higher Education | 1 | 0.5 | 1 | 0.5 | 0 | 0 | 3 | 50.0 |
| PS45 | Navigating the Future of Pedagogy: the Integration of AI Tools in Developing Educational Assessment Rubrics | 1 | 0.5 | 1 | 0.5 | 0 | 0 | 3 | 50.0 |

| Primary Study | Title | QA1 | QA2 | QA3 | QA4 | QA5 | QA6 | Total Mark | Percentage (%) |
|---|---|---|---|---|---|---|---|---|---|
| PS46 | Pedagogical Framework for Cultivating Children's Data Agency and Creative Abilities in the Age of AI | 1 | 0.5 | 1 | 1 | 0 | 0 | 3.5 | 58.3 |
| *PS47* | *Prospects of Autonomous Vehicle Learning Kits in Education Systems* | *0* | *0.5* | *1* | *0.5* | *0* | *0* | *2* | *33.3* |
| PS48 | Redefining Education in Sports Sciences: A Theoretical Study for Integrating Competency-Based Learning for Sustainable Employment in Spain | 0 | 1 | 1 | 1 | 1 | 0 | 4 | 66.7 |
| PS49 | Reshaping Curriculum Adaptation in the Age of Artificial Intelligence: Mapping Teachers' AI-Driven Curriculum Adaptation Patterns | 0 | 1 | 1 | 0.5 | 1 | 0 | 3.5 | 58.3 |
| PS50 | Robot NAO Integrated Lesson vs. Traditional Lesson: Measuring Learning Outcomes on the Topic of "Societal Change" and the Mediating Effect of Students' Attitudes | 1 | 0.5 | 1 | 0.5 | 0 | 0 | 3 | 50.0 |
| PS51 | Shaping the Future of Translation Careers: Student Interest and the Need for Curriculum Reform in the AI Era | 1 | 0.5 | 1 | 0.5 | 1 | 0 | 4 | 66.7 |
| *PS52* | *Shaping the Future: How Robot Programming Education Changes the Attitudes of Robotics among Rural Primary School Students in a Developing Country* | *1* | *1* | *0* | *0.5* | *0* | *0* | *2.5* | *41.7* |
| *PS53* | *Tangible Computing Tools in AI Education: Approach to Improve Elementary Students' Knowledge, Perception, and Behavioral Intention towards AI* | *0* | *0.5* | *0* | *1* | *0* | *0* | *1.5* | *25.0* |
| PS54 | Teaching AI in Business Schools: A Pathway to Future-Ready Graduates | 1 | 0.5 | 1 | 1 | 0 | 0 | 3.5 | 58.3 |
| PS55 | The Impact of Artificial Intelligence on Higher Education: An Empirical Study | 1 | 1 | 1 | 0.5 | 0 | 0 | 3.5 | 58.3 |
| PS56 | The role of industry-academia collaboration in enhancing educational opportunities and outcomes under the digital driven Industry 4.0 | 0 | 1 | 0 | 1 | 1 | 0 | 3 | 50.0 |
| PS57 | The Use of ChatGPT for Education Modules on Integrated Pharmacotherapy of Infectious Disease: Educators' Perspectives | 1 | 1 | 1 | 0.5 | 0 | 1 | 4.5 | 75.0 |
| *PS58* | *Towards human-AI collaboration in the competency-based curriculum development process: The case of* | *0* | *1* | *1* | *0.5* | *0* | *0* | *2.5* | *41.7* |

| Primary Study | Title | QA1 | QA2 | QA3 | QA4 | QA5 | QA6 | Total Mark | Percentage (%) |
|---|---|---|---|---|---|---|---|---|---|
| | *industrial engineering and management education* | | | | | | | | |
| PS59 | Transversal skills in applied Artificial Intelligence - the case of the financial sector | 1 | 0.5 | 1 | 1 | 0 | 0 | 3.5 | 58.3 |
| *PS60* | *Understanding the skills gap between higher education and industry in the UK in artificial intelligence sector* | *0* | *0.5* | *0* | *0.5* | *0* | *0* | *1* | *16.7* |
| PS61 | Validating the knowledge represented by a self-organizing map with an expert-derived knowledge structure | 1 | 0.5 | 1 | 0.5 | 1 | 0 | 4 | 66.7 |