Contemporary Educational Technology, 2026, **18**(2), ep652
ISSN: 1309-517X (Online)

OPEN ACCESS

Review Article

The role of artificial intelligence in special and inclusive education: A systematic literature review

Surakrai Nantaburom [1]
0000-0002-0585-6911

Suthanit Wetcho [2*]
0000-0003-4668-528X

[1] Thammasat Secondary School, Faculty of Learning Sciences and Education, Thammasat University, Bangkok, THAILAND
[2] Faculty of Education, Kasetsart University, Bangkok, THAILAND
[*] Corresponding author: suthanit.w@ku.th

Citation: Nantaburom, S., & Wetcho, S. (2026). The role of artificial intelligence in special and inclusive education: A systematic literature review. *Contemporary Educational Technology, 18*(2), Article ep652. https://doi.org/10.30935/cedtech/18489

ARTICLE INFO

Received: 26 Jun 2025
Accepted: 11 Apr 2026

ABSTRACT

In response to the growing global integration of artificial intelligence (AI) in education, this systematic literature review explores its role in supporting special and inclusive education. The review focuses on how AI technologies enhance accessibility, provide personalized learning experiences for students with disabilities, and support inclusive pedagogical practices. A systematic search was conducted across six major databases—Scopus, Web of Science, Google Scholar, EBSCO, ERIC, and ProQuest—for peer-reviewed articles published between January 2017 and December 2024. AI-assisted platforms, such as Semantic Scholar and Consensus, were also utilized to strengthen the search process. Twenty-one eligible studies were selected and analyzed through qualitative thematic synthesis. Three major themes emerged: (1) AI applications for personalization and assistive learning, (2) challenges in implementation, including teacher readiness and user involvement, and (3) ethical considerations such as fairness, transparency, and inclusive design. The review highlights AI's transformative potential in advancing equitable education, while emphasizing the need for ethical frameworks, co-design with users, and systemic support. The findings suggest that future efforts should focus on curriculum integration, policy development, and capacity-building among educators to ensure that AI technologies are implemented effectively and inclusively.

Keywords: artificial intelligence, inclusive education, special education, educational technology, systematic literature review, AI ethics in education

INTRODUCTION

Artificial intelligence (AI) is a field within computer science dedicated to designing systems that simulate human cognitive processes—such as learning, reasoning, and decision-making—to enhance problem-solving across diverse contexts, including education (Dwivedi et al., 2021). AI systems employ a variety of techniques, including neural networks, machine learning, expert systems, fuzzy logic, and swarm intelligence, to solve complex problems beyond the scope of traditional algorithms.

In the educational domain, AI has been studied for over three decades, initially focusing on computer-based instruction and evolving into intelligent systems that support both formal and lifelong learning (Hamal et al., 2022). The integration of AI into education has been accelerated by advancements in digital technologies, including smartphones, cloud computing, and big data. These developments have led to the emergence of intelligent tutoring systems, adaptive learning environments, and educational chatbots that offer personalized support and enhance accessibility. Recent literature categorizes artificial intelligence in education (AIED) into five core research themes:

(1) adaptive learning and personalized instruction,

(2) deep learning applications in online learning,

(3) human-AI interaction in educational settings,

(4) the use of AI-generated data for learning analytics (LA), and

(5) AI's role in higher education (Bozkurt et al., 2021).

Despite significant advancements, the ethical implications of AI remain underexplored, particularly concerning data privacy, algorithmic fairness, and inclusive design. The trajectory of AIED has progressed from early rule-based systems to web-based platforms, and now to AI-driven agents, humanoid robots, and autonomous chatbots that can operate independently or assist instructors (Chen et al., 2020). These technologies not only facilitate remote and adaptive learning but also help in identifying and predicting student behaviors, offering opportunities for early interventions. Furthermore, AI applications are increasingly relevant in special and inclusive education. Tools such as behavior analytics, facial recognition, communication assistants, and chatbots are being tailored to meet the needs of learners with disabilities. These advancements signify AI's potential to bridge gaps in educational equity and support diverse learners.

Despite the rapid expansion of research in AIED, limited studies have systematically examined how AI specifically supports special and inclusive education contexts (Hwang et al., 2020). Much of the existing literature focuses on general educational applications, resulting in a fragmented understanding of how AI technologies address accessibility, assistive learning, and inclusive pedagogical practices for students with disabilities. Accordingly, a systematic review of current research is essential to synthesize emerging trends, identify key challenges, and highlight opportunities for the effective integration of AI in special and inclusive education.

Beyond education, AI has demonstrated transformative potential across multiple industries, including healthcare, manufacturing, finance, and logistics (Sennott et al., 2019). As machine learning and autonomous decision-making capabilities advance, the implications for inclusive and accessible innovation continue to expand.

This research aims to review the current knowledge state of AI for special and inclusive education publications on worldwide databases. Accordingly, this study aims to systematically review recent research on the role of AI in special and inclusive education. Specifically, the study seeks to:

(1) identify the major AI technologies applied in special and inclusive education,

(2) examine the challenges and ethical issues associated with their implementation, and

(3) synthesize emerging research directions that support inclusive and equitable learning environments.

METHOD

To achieve these objectives, this study employed a systematic literature review methodology to synthesize existing research on the integration of AI in special and inclusive education, with particular attention to accessibility, personalized learning, and ethical considerations. The review process followed the preferred reporting items for systematic reviews and meta-analyses (PRISMA 2020) guidelines to ensure transparency and methodological rigor in the identification, screening, and selection of relevant studies. Following the study selection process, a qualitative thematic analysis was conducted to synthesize the findings of the included studies. The analysis followed the six-phase framework proposed by Braun and Clarke (2006), to identify key patterns and thematic dimensions related to the application of AI in special and inclusive education.

A comprehensive literature search was conducted across six academic databases—Scopus, Web of Science, Google Scholar, EBSCO, ERIC, and ProQuest—using combinations of keywords such as "artificial intelligence," "special education," "inclusive education," and "educational technology," with Boolean operators (AND and OR) to enhance search precision. Additionally, AI-supported tools, including Semantic Scholar and Consensus, were used to expand the search scope and refine relevance. The study selection followed the PRISMA 2020 framework. A total of 600 records were initially identified, of which 414 remained after removing duplicates and irrelevant records. These were screened based on titles and abstracts, followed by full-text assessment using predefined inclusion criteria. Ultimately, 21 studies were selected for qualitative synthesis. The inclusion criteria were:

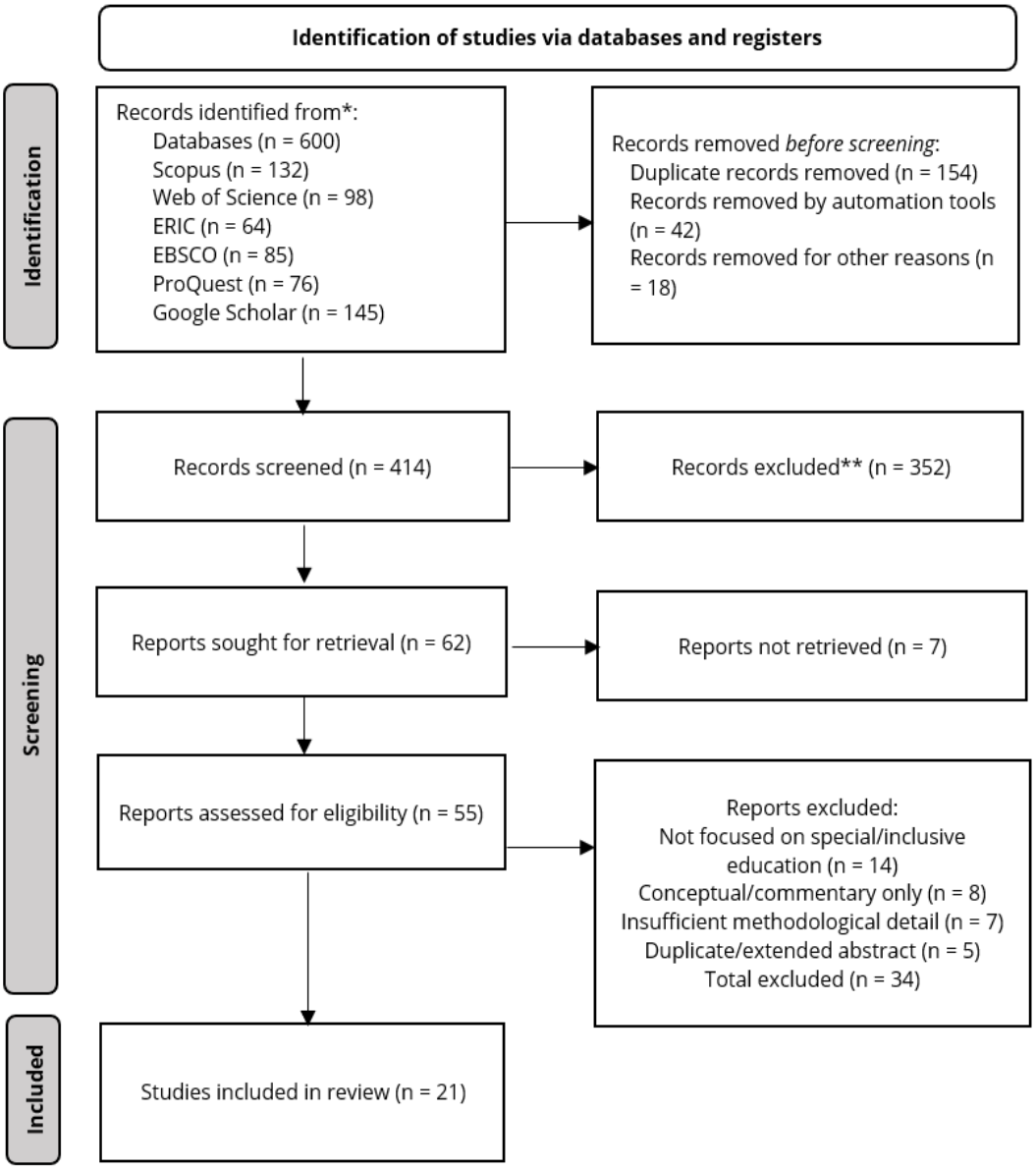

Figure 1. The identification of studies included in a systematic review (Adapted from the PRISMA 2020 flow diagram, applied for the present study)

(1) peer-reviewed journal articles,

(2) publications from 2017 to 2024,

(3) English-language studies,

(4) indexing in at least one selected database, and

(5) a focus on AI applications in special or inclusive education.

The selection process involved three stages: initial screening, full-text review, and final inclusion, resulting in 21 studies for analysis. **Figure 1** shows the identification of studies included in a systematic review.

Thematic analysis was conducted following the six-phase framework proposed by Braun and Clarke (2006), which includes familiarization with data, generation of initial codes, theme identification, theme review, theme definition, and reporting. Themes were derived inductively, capturing common patterns and conceptual categories such as AI applications, implementation challenges, and ethical implications. Thematic synthesis allowed for a nuanced understanding of how AI is currently positioned to support learners with disabilities and promote inclusive educational practices (Ahmad et al., 2021; Bozkurt et al., 2021; Chen et al., 2020; Coleman, 2021; Dwivedi et al., 2021; Sennott et al., 2019).

RESULTS

To provide contextual grounding for these findings, the characteristics of the studies included in the systematic review are summarized in **Table 1**, which presents key information such as study type, research design, sample, aims, and main findings.

Table 1. Characteristics of the studies included in the systematic review

No	Article type	Author	Research design & sample	Aim	Finding/outcome
1	Literature review	Trewin et al. (2019)	Literature review	To describe opportunities and risks across four emerging AI application areas: Employment, education, public safety, and healthcare, based on a workshop with participants who have disabilities.	AI systems should be evaluated for their impact on users in broader contexts. They must provide error-correction mechanisms and allow affected individuals to raise concerns about fairness. Including people with disabilities in data collection and testing is essential to developing inclusive AI systems.
2	Literature review	Drigas and Ioannidou (2012)	Literature review	To enhance children's interactions with their environment, promoting learning and enriching their daily lives.	Accurate diagnosis and individualized intervention strategies are crucial due to the implicit nature of special educational needs. AI is useful for precise diagnosis and timely intervention.
3	Literature review	Wald (2021)	Literature review	To help AI developers understand unique issues concerning disability inclusion and the relationship between "personalization" and "classification."	The relationship between "personalization" and "classification" for disability inclusion is unique due to the wide range of disabilities. This necessitates tailored AI solutions.
4	Literature review	Kumar et al. (2024)	Literature review	To examine AI's impact on individuals with disabilities and its potential to improve daily living.	AI-driven solutions are aiding individuals with disabilities in daily activities, promoting inclusivity, and facilitating independent living.
5	Literature review	Kaelin et al. (2020)	Systematic literature review (94 documents)	To examine how AI is integrated into pediatric rehabilitation to help children with disabilities participate in valuable activities.	Research into AI-driven pediatric rehabilitation is growing, indicating AI's potential to enhance participation in activities for children with disabilities.
6	Literature review	Dwivedi et al. (2021)	Expert contributions	To provide insights into AI technology's potential applications and future impact across various industries.	AI offers significant opportunities but also poses challenges that must be addressed to ensure successful implementation.
7	Literature review	Coleman (2021)	Literature review	To explore the relationship between AI applications and intelligent systems.	AI technologies such as neural networks and machine learning enable the creation of intelligent machines capable of solving complex problems.
8	Literature review	Sennott et al. (2019)	Systematic literature review	To describe AI's role in augmentative and alternative communication (AAC) systems.	AI tools can improve AAC by simulating human intelligence and adapting to new situations. However, careful consideration of risks and limitations is necessary.
9	Literature review	Hamal et al. (2022)	Literature review	To explore advancements in AIED, educational data mining (EDM), and LA.	AI, EDM, and LA fields have made significant progress, with applications in adaptive learning and student behavior analysis.
10	Literature review	Ahmad et al. (2021)	Literature review	To explore AI applications in education.	AI tools such as social robots, smart learning systems, and intelligent tutoring systems help address educational challenges by providing innovative solutions.

Table 1 (Continued).

No	Article type	Author	Research design & sample	Aim	Finding/outcome
11	Literature review	Chen et al. (2020)	Literature review	To assess AI's impact on education.	AI personalizes learning through machine learning and adaptability, enhancing student engagement and retention.
12	Documentary review and interview	Garg and Sharma (2020)	Documentary review and interviews with teachers and students with special needs	To analyze how AI impacts education for students with special needs.	The study focused on analyzing AI's impact on special needs education and how it helps teachers. It also proposed a framework for an inclusive future in special needs education based on interviews.
13	Documentary review and interview	Jobin et al. (2019)	Documentary research	To explore the possibility of a global agreement on AI ethics principles.	AI ethics guidelines converge on five fundamental principles, though variations exist in their interpretation and application.
14	Systematic review	Panjwani-Charania and Zhai (2024)	Systematic review of 16 studies, primarily focused on dyslexia	To examine how AI supports students with learning disabilities.	AI has the potential to assist students with learning disabilities. However, more empirical research is needed to explore AI's broader role in supporting these students beyond identification and diagnosis.
15	Systematic review	Bozkurt et al. (2021)	Systematic review using social network analysis and text-mining	To examine AI research in online distance education.	The study identifies themes like adaptive learning, human-AI interaction, and AI's role in higher education, with a focus on ethics as an under-researched area.
16	Systematic review	Dogan et al. (2023)	Systematic review using data mining and analytics	To examine AI's use in online distance education.	AI improves online teaching by recognizing student behaviors and personalizing learning. However, its use in online education needs further research.
17	Chatbot-led user study	Gupta and Chen (2022)	Chatbot-led user study with 215 undergraduate students	To investigate the opportunities and requirements for chatbots as intelligent helpers in education, promoting equity.	Chatbots support disadvantaged students by answering questions, providing supplementary materials, and tailoring learning to individual needs. They connect students to campus resources, though they have limitations like the need for training and lack of emotional understanding.
18	Auto-ethnography and reflection	Smith and Smith (2021)	Auto-ethnography and reflection	To explore the interface between AI and disability and the ethical dilemmas involved.	AI technology can be both helpful and frustrating. While expectations are often met, there are instances where they fall short. Generally, experiences with AI in this context are positive.
19	AI intervention and data collection	Shutaleva et al. (2023)	AI intervention and data collection from two boys with disabilities	To study AI assistants for students with disabilities in the Japanese context.	The study identified specific learning behaviors using AI technology and explored the challenges of learning with AI, highlighting the importance of human involvement in inclusive education.
20	Inclusive action research	Robinson (2017)	Inclusive action research (22 participants)	To identify principles for effective inclusive teacher education for special needs - students.	Collaborative research among educators fosters confidence in implementing inclusive practices and promotes professional development.
21	Qualitative sociological study	Shutaleva et al. (2023)	Qualitative sociological study (125 participants)	To study teachers' readiness to work with students with special educational needs.	Inclusive education promotes equal opportunities for students with disabilities, supporting their professional development and individual self-determination.

The results of the systematic review are organized into five thematic categories derived from the qualitative thematic analysis. These themes reflect key areas in which AI is applied within special and inclusive education, including:

(1) AI applications for inclusive learning,

(2) AI tools supporting physical disabilities,

(3) AI chatbots for inclusive education,

(4) AI-enhanced learning environments, and

(5) AI in youth rehabilitation.

This thematic structure provides a comprehensive framework for understanding the diverse roles and contributions of AI in promoting accessibility, personalization, and inclusive educational practices.

AI Applications for Inclusive Learning

The integration of AI into special and inclusive education has significantly transformed the way diverse learners are supported. Technologies such as intelligent tutoring systems, adaptive learning platforms, and behavior analytics tools offer personalized educational experiences tailored to the unique needs of students with disabilities. These AI tools enhance accessibility, provide real-time feedback, and enable early diagnosis and timely interventions for learning difficulties.

Over the past decade, AI methods have been widely adopted for accurate diagnosis and intervention planning, particularly in enhancing children's interaction with their learning environments (Drigas & Ioannidou, 2012). These systems have been shown to enrich educational experiences and promote active engagement. A comprehensive typology of AI applications identified by Panjwani-Charania and Zhai (2024), includes seven major categories: adaptive learning systems, facial expression recognition, chatbots, communication assistants, mastery learning platforms, intelligent tutors, and interactive robots. These tools collectively illustrate the breadth of AI's role in addressing special educational needs and promoting inclusive learning practices.

AI Tools Supporting Physical Disabilities

AI-driven technologies have proven highly beneficial for individuals with physical, visual, and auditory impairments by facilitating independence, communication, and daily functioning. For visually impaired learners, tools such as VoiceOver, TalkBack, Siri, Google Assistant, Cortana, and Lookout by Google assist with screen navigation, object identification, and voice-based interaction. These applications enable users to access digital content independently through voice commands and real-time object recognition.

In the context of hearing impairments, advancements in AI-powered speech-to-text systems such as Ava, Otter.ai, and Google Live Transcribe support inclusive communication by converting spoken language into readable text in real-time. These tools enhance classroom participation and interaction without requiring lip reading.

For learners with motor or speech disabilities, AI applications such as Google Voice Access, IFTTT, and VoiceItt enable voice-activated control of digital devices and improve accessibility through intuitive commands. Furthermore, gesture-based website navigation and facial recognition features for CAPTCHA verification offer additional support for navigating online environments. These innovations collectively promote autonomy and reduce access barriers (Kumar et al., 2024).

AI Chatbots for Inclusive Learning

Chatbots represent a promising tool for supporting students with a wide range of learning needs, including those with visual and auditory impairments, learning disabilities, and communication challenges. These systems offer accessible, personalized, and responsive learning support through both voice and text interfaces.

For visually impaired students, chatbots with audio-based feedback improve content accessibility, while hearing-impaired learners benefit from real-time text-based communication. Additionally, chatbots create inclusive and non-judgmental learning environments where students can interact without fear of criticism. Their design simplicity, immediate feedback, and short-form responses are particularly beneficial for learners with cognitive or processing difficulties. Overall, chatbot technologies contribute significantly to inclusive learning by fostering engagement, personalization, and academic confidence (Gupta & Chen, 2022).

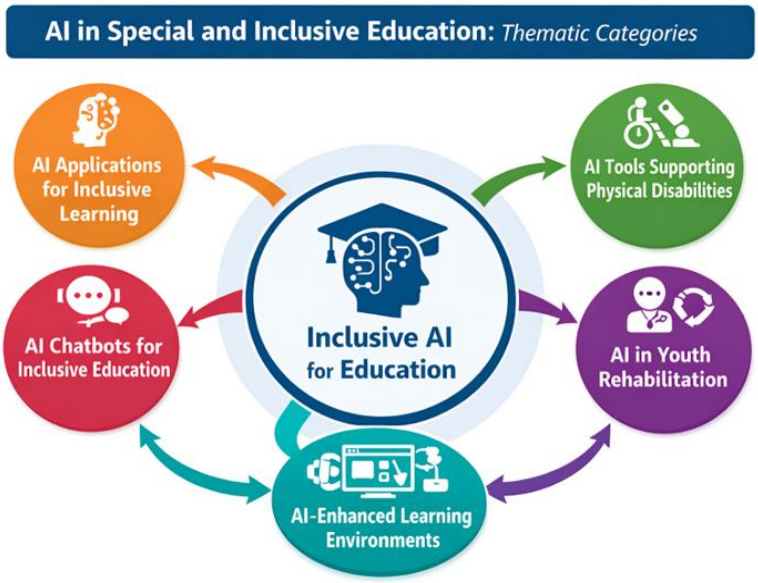

Figure 2. Demonstration of AI's role in inclusive education (Source: Generated by the authors with the assistance of ChatGPT, based on the study's thematic analysis)

AI-Enhanced Inclusive Learning Environments

Toyokawa et al. (2023) introduced the learning environment with AR and feedback (LEAF) framework, an innovative AI-enhanced learning environment that integrates augmented reality (AR) and LA. LEAF includes features such as Book Roll, which provides digital reading materials with highlighting and memo functionalities, and Log Palette, which captures and visualizes learner interaction data such as annotations and reading time. The system accommodates multiple input modes, including stylus pens, keyboards, and voice commands, thereby enhancing accessibility for diverse learners. In a case study involving two students with communication and autism-related disabilities, the system effectively captured distinct learning behaviors. The findings highlight the potential of AI-assisted AR systems in promoting personalized instruction and inclusive educational design.

AI in Youth Rehabilitation

In the domain of youth rehabilitation, AI technologies have shown great potential in supporting children and adolescents with physical and developmental disabilities. While many current interventions employ robotics and visualization technologies, there is increasing interest in tools such as speech-to-sign language translation and AI-driven recommender systems for individualized support.

Most interventions are conducted in person; however, remote and hybrid delivery models are also being explored. A key feature of these interventions is personalization—many are tailored to the needs of specific diagnostic groups, although there is a growing emphasis on flexible, learner-centered designs. These tools demonstrate AI's expanding role in therapeutic and rehabilitative contexts (Kaelin et al., 2020). **Figure 2** shows the demonstration of AI's role in inclusive education.

To better understand the AI integration in special and inclusive education, **Table 2** categorizes the primary types of AI technologies identified in the literature. Each category highlights specific tools or systems and their corresponding educational functions. This synthesis provides a clear overview of how AI is being utilized to address the diverse needs of learners with disabilities and to support inclusive pedagogical practices across various educational settings.

DISCUSSION

Despite the promising applications of AI in special and inclusive education, several implementation challenges persist. AI-based tools—such as real-time captioning, sign language translation, robotic assistance, virtual reality systems, and brain-computer interfaces—have shown transformative potential in promoting

Table 2. Thematic categories of AI tools and their key functions in special and inclusive education

Thematic category	AI tools/technologies	Key functions
AI applications for inclusive learning	Adaptive learning systems, facial expression recognition, chatbots, communication assistants, mastery learning platforms, intelligent tutors, interactive robots (Drigas & Ioannidou, 2012; Panjwani-Charania & Zhai, 2024)	Personalized learning, early diagnosis, behavior monitoring, adaptive content delivery
AI tools supporting physical disabilities	VoiceOver, TalkBack, Siri, Google Assistant, Cortana, Lookout by Google, Ava, Otter.ai, Google Live Transcribe, Google Voice Access, IFTTT, VoiceItt, facial recognition, gesture navigation (Kumar et al., 2024)	Assistive navigation, real-time transcription, voice control, accessibility for vision/hearing/motor impairments
AI chatbots for inclusive education	Chatbots with audio/text interaction, simplified interface, real-time feedback, personalized responses (Gupta & Chen, 2022)	Inclusive, non-judgmental interaction; support for cognitive, visual, auditory challenges
AI-enhanced learning environments	LEAF framework: Book Roll (digital reading), Log Palette (LA), AR input modes: stylus, keyboard, voice (Toyokawa et al., 2023)	Multimodal access, behavior tracking, personalized digital reading support, inclusive design
AI in youth rehabilitation	Robotics, visualization tools, speech-to-sign language translators, recommender systems, hybrid delivery tools (Kaelin et al., 2020)	Individualized rehabilitation, personalized support, remote therapy, learner-centered flexibility

autonomy and inclusivity for individuals with intellectual and physical disabilities (Almufareh et al., 2023). However, the effectiveness of these technologies often hinges on personalization and user-centered design, which remain inconsistent across implementations.

A central challenge lies in the underrepresentation of individuals with disabilities in the development and testing of AI systems. As Wald (2021) emphasizes, designing inclusive AI requires the active involvement of end users from the outset. This includes refining features such as audio description accuracy, sign language translation tools, and behavior recognition systems. Notably, disability-centered technologies often produce benefits that extend to the general population, further underscoring the societal value of inclusive design.

The literature also highlights the evolving intersection of AI, disability, and ethics as a domain rich with opportunity but fraught with usability gaps. Frustrations with current AI tools—ranging from interface limitations to inadequate contextual adaptation—highlight the importance of collaborative, human-centered design processes. In alignment with the principle of "nothing about us without us," Smith and Smith (2021) advocate for co-design practices that engage individuals with disabilities as integral members of AI development teams. This participatory approach ensures that AI tools reflect the real-world needs, preferences, and diverse contexts of their users.

Furthermore, inclusive AI development requires participation not only in system design but also in data collection and testing phases. Trewin et al. (2019) argue that applying principles of human-centered design, transparency, and fairness can guide AI engineers and researchers toward building more ethical and equitable systems. By embedding these values into the lifecycle of AI development, technologies can become more robust, inclusive, and capable of minimizing harm while maximizing educational benefit.

As AI continues to shape global education systems, ethical considerations have become increasingly central to its responsible implementation (Holmes et al., 2019; Zhai et al., 2021). A global review of AI ethics guidelines by Jobin et al. (2019) revealed that, while no single universal standard exists, there is convergence around key principles such as transparency, fairness, justice, non-maleficence, responsibility, privacy, autonomy, beneficence, dignity, and sustainability. These principles, although interpreted differently across contexts, provide a foundational framework for guiding ethical AI deployment. In the context of special and inclusive education, these ethical considerations must be carefully contextualized to ensure that AI technologies uphold human dignity, promote equitable access, and safeguard the rights of learners with diverse needs. Accordingly, stakeholders—including policymakers, educators, and developers—must ensure that AI systems are transparent, accountable, and aligned with principles of fairness and inclusion. This entails establishing clear guidelines for ethical data use, addressing potential algorithmic bias, and implementing safeguards to prevent misuse or unintended harm.

Additionally, ethical preparedness must extend to the professional development of educators. Shutaleva et al. (2023) stress that teacher competence and psychological readiness are vital for sustaining inclusive

practices in digitally enriched classrooms. Teachers should be trained not only in the technical use of AI but also in the ethical responsibilities associated with its use—such as consent, accessibility, and equity. While Robinson (2017) further recommends embedding ethical training within inclusive teacher education through collaborative, reflective practice and theoretical engagement. Such programs should empower educators to critically evaluate AI tools and apply them in ways that reinforce inclusive values rather than exacerbate existing inequalities.

CONCLUSION

AI has demonstrated significant potential in transforming special and inclusive education by offering adaptive, accessible, and personalized learning experiences for students with diverse needs. As the reviewed literature suggests, AI applications—including intelligent tutoring systems, chatbots, assistive communication tools, and behavior analytics—can enhance early diagnosis, support daily functioning, and promote inclusive classroom environments (Drigas & Ioannidou, 2012; Panjwani-Charania & Zhai, 2024).

However, realizing the full potential of AIED requires addressing key ethical and practical challenges. These include ensuring transparency, fairness, and co-design with individuals with disabilities in the development of AI systems (Jobin et al., 2019; Smith & Smith, 2021). Involving end-users meaningfully in the design, data collection, and evaluation processes is essential to creating inclusive technologies that align with real-world needs (Trewin et al., 2019; Wald, 2021).

Equally important is preparing educators and stakeholders through inclusive teacher education and professional learning communities that emphasize ethical literacy, accessibility, and pedagogical innovation (Robinson, 2017). With strategic investment in training, curriculum design, and stakeholder collaboration—including the involvement of parents—AI can become a catalyst for equity and empowerment in education (Toyokawa et al., 2023).

Future research should continue to explore data-informed, human-centered AI applications that address a broad spectrum of disabilities, while advancing universal design principles and sustainable ethical frameworks. By integrating technological advancement with inclusive educational values, AI can serve as a powerful tool in reshaping learning environments to be more equitable, effective, and accessible for all learners.

Acknowledgment: This research is an extension of work undertaken during the author's studies at the University of Sydney. The author would like to express sincere gratitude to Kerri Tearle and Ilektra Spandagou for their valuable guidance and constructive feedback. The author also gratefully acknowledges the support from the Research and Creative Works Division, Faculty of Education, Kasetsart University, for their assistance in supporting the academic writing and development of this manuscript.

Author contributions: Surakrai Nantaburom contributed to the conceptualization and development of the study by identifying key research issues and formulating research questions and hypotheses. Surakrai was responsible for designing the research framework, including the development of tools and systematic review procedures. This included defining the search strategy and establishing inclusion and exclusion criteria for the systematic literature review. Surakrai also led the drafting of substantial portions of the manuscript and prepared the supplementary materials. Suthanit Wetcho contributed to the refinement of the study by reviewing and editing the manuscript for clarity, coherence, and academic quality. This included copy-editing, providing critical feedback and suggestions, and revising the manuscript. Suthanit reviewed figures and tables and contributed to refining and aligning the overall research goals and aims. Both authors approved the final version of the article.

Funding: The authors received no financial support for the research and/or authorship of this article.

Ethics declaration: This study is a systematic review of previously published literature and does not involve human or animal subjects. All efforts were made to accurately represent and appropriately cite the original sources included in the review.

AI statement: AI-supported tools, including Semantic Scholar and Consensus, were used to support literature by expanding the search scope and refining the relevance of sources. In addition, ChatGPT was used to assist in generating figure concepts and improving language clarity. All outputs were critically reviewed, verified, and revised by the authors.

Declaration of interest: The authors declared no competing interests.

Data availability: Data generated or analyzed during this study are available from the authors on request.

REFERENCES

Ahmad, S., Rahmat, M., Mubarik, M., Alam, M., & Hyder, S. (2021). Artificial intelligence and its role in education. *Sustainability, 13*(22), Article 12902. https://doi.org/10.3390/su132212902

Almufareh, M. F., Tehsin, S., Humayun, M., & Kausar, S. (2023). Intellectual disability and technology: An artificial intelligence perspective and framework. *Journal of Disability Research, 2*(4), 58-70. https://doi.org/10.57197/JDR-2023-0055

Bozkurt, A., Karadeniz, A., Bañeres, D., Guerrero-Roldán, A., & Rodríguez, M. (2021). Artificial intelligence and reflections from educational landscape: A review of AI studies in half a century. *Sustainability, 13*(2), Article 800. https://doi.org/10.3390/SU13020800

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77-101. https://doi.org/10.1191/1478088706qp063oa

Chen, L., Chen, P., & Lin, Z. (2020). Artificial intelligence in education: A review. *IEEE Access, 8*, 75264-75278. https://doi.org/10.1109/ACCESS.2020.2988510

Coleman, J. P. H. (2021). AI and our understanding of intelligence. In K. Arai, S. Kapoor, & R. Bhatia (Eds.), *Intelligent systems and applications* (vol. 1250, pp. 200-214). Springer. https://doi.org/10.1007/978-3-030-55180-3_15

Dogan, M., Dogan, T., & Bozkurt, A. (2023). The use of artificial intelligence (AI) in online learning and distance education processes: A systematic review of empirical studies. *Applied Sciences, 13*(5), Article 3056. https://doi.org/10.3390/app13053056

Drigas, A. S., & Ioannidou, R. D. (2012). Artificial intelligence in special education: A decade review. *International Journal of Engineering Education, 28*(6), 1366-1372. https://www.ijee.ie/contents/c280612.html

Dwivedi, Y. K., Hughes, L., Ismagilova, E., Aarts, G., Coombs, C., Crick, T., Duan, Y., Dwivedi, R., Edwards, J., Eirug, A., Galanos, V., Ilavarasan, P. V., Janssen, M., Jones, P., Kar, A. K., Kizgin, H., Kronemann, B., Lal, B., Lucini, B., … Williams, M. D. (2021). Artificial intelligence (AI): Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy. *International Journal of Information Management, 57*, Article 101994. https://doi.org/10.1016/j.ijinfomgt.2019.08.002

Garg, S., & Sharma, S. (2020). Impact of artificial intelligence in special need education to promote inclusive pedagogy. *International Journal of Information and Education Technology, 10*(7), 523-527. https://doi.org/10.18178/ijiet.2020.10.7.1418

Gupta, S., & Chen, Y. (2022). Supporting inclusive learning using chatbots? A chatbot-led interview study. *Journal of Information Systems Education, 33*(1), 98-108. https://jise.org/Volume33/n1/JISE2022v33n1pp98-108.pdf

Hamal, O., Faddouli, N., Harouni, M., & Lu, J. (2022). Artificial intelligence in education. *Sustainability, 14*(5), Article 2862. https://doi.org/10.3390/su14052862

Holmes, W., Bialik, M., & Fadel, C. (2019). *Artificial intelligence in education: Promises and implications for teaching and learning*. Center for Curriculum Redesign. https://unesdoc.unesco.org/ark:/48223/pf0000368021

Hwang, G.-J., Xie, H., Wah, B. W., & Gašević, D. (2020). Vision, challenges, roles and research issues of artificial intelligence in education. *Computers and Education: Artificial Intelligence, 1*, Article 100001. https://doi.org/10.1016/j.caeai.2020.100001

Jobin, A., Ienca, M., & Vayena, E. (2019). The global landscape of AI ethics guidelines. *Nature Machine Intelligence, 1*, 389-399. https://doi.org/10.1038/S42256-019-0088-2

Kaelin, V., Valizadeh, M., Salgado, Z., Parde, N., & Khetani, M. (2020). Artificial intelligence in rehabilitation targeting the participation of children and youth with disabilities: Scoping review. *Journal of Medical Internet Research, 23*(11), Article e25745. https://doi.org/10.2196/25745

Kumar, V., Barik, S., Aggarwal, S., Kumar, D., & Raj, V. (2024). The use of artificial intelligence for persons with disability: A bright and promising future ahead. *Disability and Rehabilitation: Assistive Technology, 19*(6), 2415-2417. https://doi.org/10.1080/17483107.2023.2288241

Panjwani-Charania, S., & Zhai, X. (2024). AI for students with learning disabilities: A systematic review. In X. Zhai, & J. Krajcik (Eds.), *Uses of artificial intelligence in STEM education (pp. 469-493)*. Oxford University Press. https://doi.org/10.1093/oso/9780198882077.003.0021

Robinson, D. (2017). Effective inclusive teacher education for special educational needs and disabilities: Some more thoughts on the way forward. *Teaching and Teacher Education, 61*, 164-178. https://doi.org/10.1016/J.TATE.2016.09.007

Sennott, S., Akagi, L., Lee, M., & Rhodes, A. (2019). AAC and artificial intelligence (AI). *Topics in Language Disorders, 39*, 389-403. https://doi.org/10.1097/TLD.0000000000000197

Shutaleva, A.,Martyushev, N., Nikonova, Z., Savchenko, I., Kukartsev, V., Tynchenko, V., & Tynchenko, Y. (2023). Sustainability of inclusive education in schools and higher education: Teachers and students with special educational needs. *Sustainability, 15*(4), Article 3011. https://doi.org/10.3390/su15043011

Smith, P., & Smith, L. (2021). Artificial intelligence and disability: Too much promise, yet too little substance? *AI and Ethics, 1*, 81-86. https://doi.org/10.1007/s43681-020-00004-5

Toyokawa, Y., Horikoshi, I., Majumdar, R., & Ogata, H. (2023). Challenges and opportunities of AI in inclusive education: A case study of data-enhanced active reading in Japan. *Smart Learning Environments, 10*(1), Article 67. https://doi.org/10.1186/s40561-023-00286-2

Trewin, S., Basson, S., Muller, M., Branham, S., Treviranus, J., Gruen, D., Hebert, D., Lyckowski, N., & Manser, E. (2019). Considerations for AI fairness for people with disabilities. *AI Matters, 5*(3), 40-63. https://doi.org/10.1145/3362077.3362086

Wald, M. (2021). AI data-driven personalization and disability inclusion. *Frontiers in Artificial Intelligence, 3*, Article 571955. https://doi.org/10.3389/frai.2020.571955

Zhai, X., Chu, X., Chai, C. S., Jong, M. S.-Y., Istenic, A., Spector, M., Liu, J.-B., Yuan, J., & Li, Y. (2021). A review of artificial intelligence (AI) in education from 2010 to 2020. *Complexity, 2021(1)*, Article 8812542. https://doi.org/10.1155/2021/8812542