

# THE POTENTIAL OF ARTIFICIAL INTELLIGENCE (AI) IN IMPROVING SOCIAL ACCESS AND INCLUSION FOR PEOPLE WITH DISABILITIES

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## ABSTRACT

Artificial intelligence (AI) is a technology that has opened up new opportunities in creating a more inclusive and disability-friendly society. Notably, AI technology offers great potential in improving access and social inclusion for people with disabilities. This paper explores the important role of AI technology in overcoming the barriers faced by people with disabilities in accessing healthcare, education, and information. In addition, it analyzes the concept of social access and inclusion in the context of disability and presents theories that support the use of AI technology in expanding opportunities and strengthening the autonomy of individuals with disabilities. Using Systematic Literature Review (SLR) methods to illustrate various applications of AI technology that have helped improve the quality of life and independence of people with disabilities. However, the article also identifies challenges and obstacles that need to be addressed, including technical issues, economic accessibility, and ethical considerations. This article aims to encourage the development of more inclusive and sustainable AI technologies, as well as strengthen the role of technology in building a more inclusive society for all individuals, including people with disabilities.

Keywords: *Artificial Intelligence, Disability, Social Inclusion*

## BACKGROUND

For decades, people with disabilities have faced numerous barriers in accessing various aspect of society, including education, employment, healthcare, and social interactions. Traditional solutions often relied on manual adaptations or specialized tools, which frequently limited in their effectiveness and accessibility. Artificial Intelligence (AI) has emerged as a transformative force in enhancing access and social inclusion for individuals with disabilities. The integration of AI technologies into various domains, particularly education and employment, has the potential to significantly improve the quality of life for people with disabilities by fostering independence, enhancing communication, and promoting inclusive practices.

In the educational sector, AI tools have been developed to cater specifically to the needs of students with disabilities, particularly those with neurodevelopmental disorders such as Autism Spectrum Disorder (ASD). Research indicates that AI-enabled personalized assistive tools can enhance learning experiences for these children, making education more accessible and tailored to individual needs (Barua et al., 2022). For instance, AI applications can facilitate speech therapy and provide real-time feedback, which is crucial for effective learning (Shivani, 2024).

Furthermore, the use of AI in creating adaptive learning environments allows educators to implement inclusive teaching methodologies that accommodate diverse learning styles, thereby promoting academic success among students with disabilities (Adeleye, 2024; Almufareh, 2024). Moreover, AI technologies such as real-time captioning, sign language translation, and virtual reality applications are

revolutionizing the way individuals with disabilities interact with their environment. These innovations not only enhance communication but also empower individuals to participate more fully in society (Almufareh, 2023; Smith & Smith, 2020). For example, AI-driven prosthetics and exoskeletons have significantly improved mobility for those with physical impairments, enabling greater independence and participation in daily activities (Almufareh, 2024).

The potential of AI to create inclusive educational settings is further supported by the development of tools that adapt to the unique needs of each learner, thereby fostering an environment where all students can thrive (Hamal et al., 2022). In the workplace, the application of AI can address persistent barriers to employment for individuals with disabilities. By fostering disability confidence among employers and promoting inclusive hiring practices, AI can help dismantle negative attitudes that often hinder the integration of disabled individuals into the workforce (Lindsay et al., 2019; Gould et al., 2020). Furthermore, AI can assist in creating fair recruitment processes that mitigate biases against candidates with disabilities, thereby enhancing their employment prospects (Tilmes, 2022; Trewin et al., 2019).

The ongoing research into AI's role in shaping workplace policies and practices is essential for ensuring that individuals with disabilities are not only included but also valued in professional settings (Abid, 2024). Despite these advancements, it is crucial to acknowledge the ethical implications and challenges associated with AI technologies. Concerns regarding algorithmic bias and the representation of disabled individuals in AI datasets must be addressed to ensure equitable access and treatment (Lillywhite & Wolbring, 2019; Kamikubo, 2022). Additionally, as AI continues to evolve, it is imperative to involve individuals with disabilities in discussions about technology governance to ensure that their needs and perspectives are adequately represented (Trewin et al., 2019).

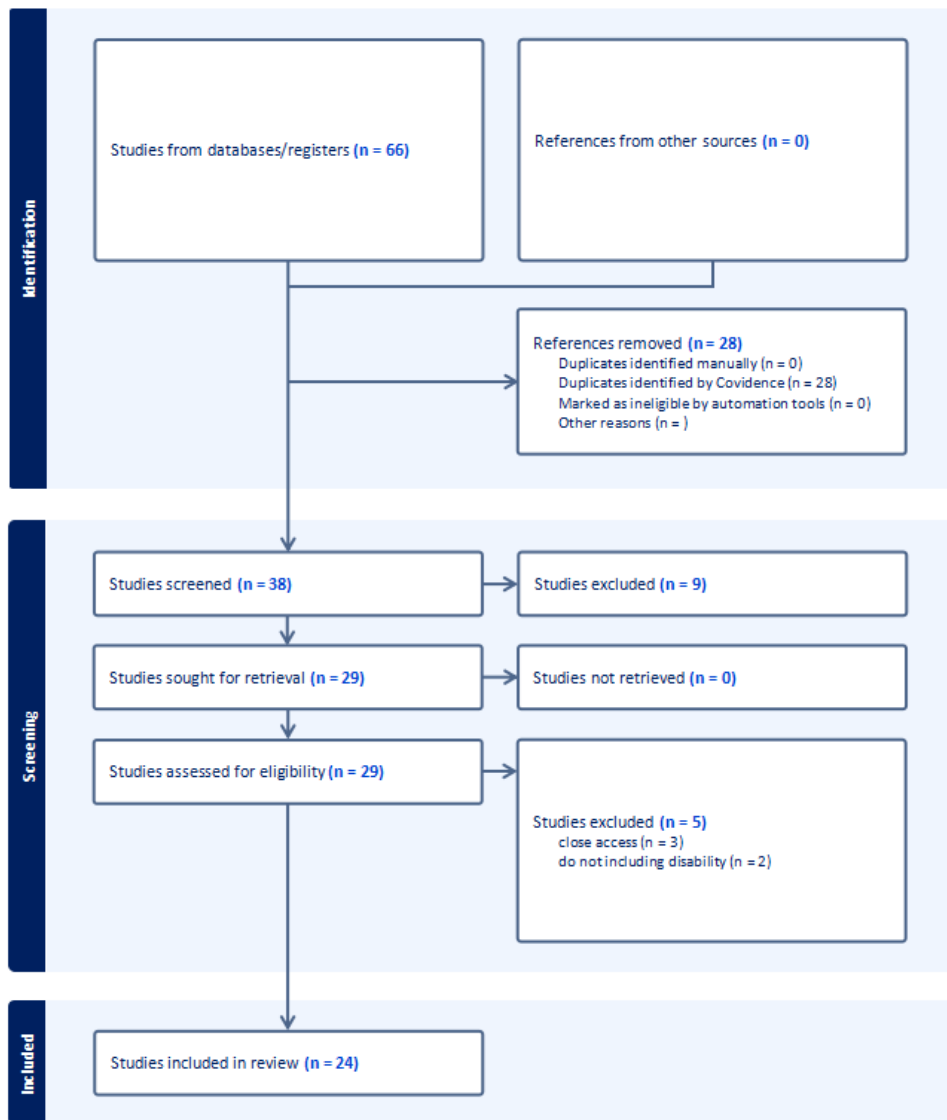
The objective of the study was pursued by performing a systematic literature review. The purpose of using this method is to encourage the development of more inclusive and sustainable AI technologies, as well as strengthen the role of technology in building a more inclusive society for all individuals, including people with disabilities.

## **RESEARCH METHOD**

Systematic Literature Review (SLR) is a type of literature review that uses systematic methods to collect, critically appraise, and synthesize secondary data. This article discusses the use of Artificial Intelligence (AI) for people with disabilities. Using Systematic Literature Review (SLR) methods to illustrate various applications of AI technology that have helped improve the quality of life and independence of people with disabilities. This article also identifies challenges and obstacles that need to be addressed, including technical issues, economic accessibility, and ethical considerations.

Literature search is done with the help of Publish or Perish by entering the search engine API key Google Scholar. This search resulted in the discovery of 200 literatures with the keyword "AI for disability" and has been published from 2019 until 2024. After the literature process, the researcher carried out a screening process and determined criteria with the help of the Mendeley application to find out the abstraction of the 66 literatures. Then, the researcher reads the abstracts and filters the literature based on the inclusion and exclusion criteria. From the screening process, the researcher obtained 24 selected literatures from the type of journal articles as primary data and supported by secondary data from books, journals, and other articles relevant to the topic.

Figure 1. Flowchart of the literature search



## DISCUSSION

The identified articles were published between 2019 and 2024, and are summarized in Figure 1.

### The Applications of AI that Help People with Disabilities

Artificial Intelligence (AI) has shown remarkable potential in enhancing the quality of life for individuals with disabilities by providing innovative solutions that promote accessibility, inclusion, and independence. This potential is particularly evident in various domains such as education, communication, and employment. In the educational sector, AI technologies are being utilized to create personalized learning experiences for students with disabilities. For instance, AI-enabled tools can adapt educational content to meet the unique needs of learners with cognitive or sensory impairments, thereby facilitating better engagement and understanding (Almufareh, 2024; Shivani, 2024). AI can help bridge gaps in learning by offering tailored support and accessible materials, which is crucial for students facing challenges in traditional educational settings (Arab, 2024; Adeleye, 2024).

Moreover, AI-driven applications can enhance communication for students with hearing impairments through real-time captioning and translation services, thus fostering a more inclusive learning environment (Kim, 2024). AI also plays a significant role in improving communication for individuals with disabilities. Voice assistants and other AI-powered communication tools have been designed to assist users with speech impairments, providing them with a means to interact more effectively with their environment (Masina et al., 2020). These technologies not only enhance autonomy but also help reduce the stigma associated with using assistive devices, as their widespread popularity makes them more socially acceptable (Masina et al., 2020). Furthermore, AI can facilitate the development of systems that translate facial movements into commands, thereby enabling individuals with severe disabilities to communicate and control devices through simple gestures (Wu, 2023).

In the workplace, AI applications are being leveraged to enhance the employment prospects of individuals with disabilities. By automating administrative tasks and improving decision-making processes, AI can help organizations create more inclusive policies and practices that support disabled employees (Alnaggar, 2023). Additionally, AI can assist in identifying and mitigating biases in recruitment processes, ensuring that candidates with disabilities are evaluated fairly and given equal opportunities (Smith & Smith, 2020). The integration of AI in workplace settings not only improves the quality of life for disabled employees but also fosters a culture of innovation and diversity within organizations (Alnaggar, 2023; Varriale et al., 2023).

### **AI for The Future of People with Disability**

The future of Artificial Intelligence (AI) in enhancing the lives of individuals with disabilities is promising and multifaceted. As AI technologies continue to evolve, they hold the potential to significantly improve accessibility, inclusion, and overall quality of life for people with disabilities across various domains, including education, employment, healthcare, and social interaction. In the educational sector, AI can transform learning experiences for students with disabilities by providing personalized and adaptive learning environments. AI-driven educational tools can tailor content to meet the specific needs of learners, thereby enhancing engagement and comprehension (Shivani (2024)Almufareh, 2024).

For instance, AI applications can analyze a student's learning patterns and adjust the difficulty level of tasks accordingly, ensuring that each student receives the appropriate level of challenge ("Advancing Cognitive Accessibility: The Role of Artificial Intelligence in Enhancing Inclusivity", 2024). This personalized approach not only fosters academic success but also promotes a sense of belonging and inclusion within the classroom (Adeleye, 2024). Furthermore, AI technologies can facilitate communication for students with hearing impairments through real-time captioning and translation services, thereby creating a more inclusive educational environment (Adeleye, 2024).

AI's role in enhancing communication extends beyond education and into everyday interactions. For individuals with speech or cognitive disabilities, AI-powered communication devices can facilitate more effective expression and interaction with others (Guo et al., 2020). Technologies such as predictive text and speech recognition systems can significantly improve the ability of these individuals to communicate their thoughts and needs, thereby promoting social inclusion (Smith & Smith, 2020). Additionally, advancements in affective computing allow AI systems to recognize and respond to emotional cues, further enhancing interpersonal communication for individuals with disabilities (Guo et al., 2021).

In the realm of employment, AI can play a crucial role in promoting the inclusion of individuals with disabilities in the workforce. By automating routine tasks and providing decision support, AI can help create more inclusive work environments that accommodate the diverse needs of employees (Braganza et al., 2021; Tejada & Calvo, 2022). For instance, AI-driven tools can assist in identifying and mitigating biases in hiring processes, ensuring that candidates with disabilities are evaluated fairly and given equal opportunities (Abid, 2024). Moreover, AI can facilitate job adaptations that were previously deemed unfeasible, allowing individuals with physical or sensory disabilities to perform tasks effectively (Tejada & Calvo, 2022). This not only enhances the employability of disabled individuals but also fosters a culture of diversity and innovation within organizations (Braganza et al., 2021; Abid, 2024).

The healthcare sector also stands to benefit significantly from AI advancements. AI technologies can assist healthcare providers in diagnosing and treating disabilities more effectively by analyzing vast amounts of data and identifying patterns that may not be immediately apparent to human practitioners (Al-Eid et al., 2022; Dresser, 2023). For example, AI can be utilized to predict the progression of certain disabilities, allowing for timely interventions and personalized treatment plans (Al-Eid et al., 2022). Furthermore, AI-driven assistive technologies can enhance the quality of life for individuals with disabilities by providing support in daily activities, such as mobility aids and smart home devices that adapt to the user's needs (Xie et al., 2020; Wu, 2023).

Despite the numerous benefits that AI can bring to individuals with disabilities, it is essential to address the ethical implications and challenges associated with its implementation. Concerns regarding data representativeness and algorithmic bias must be carefully considered to ensure that AI technologies do not inadvertently perpetuate discrimination against marginalized groups, including individuals with disabilities (Kamikubo, 2022; Gorman, 2023). Engaging disabled individuals in the design and governance of AI technologies is crucial to ensure that their perspectives and needs are adequately represented (Gorman, 2023). Moreover, ongoing research into the fairness of AI systems is necessary to mitigate potential negative impacts on disabled individuals (Trewin et al., 2019).

#### Empowering Independence: AI Technologies for Daily Living

Artificial intelligence (AI) has shown significant potential in improving the quality of life of people with disabilities in various fields. One example of the application of AI is in the development of a more inclusive transportation booking system. Research by Anggoro shows that the addition of a special seat selection feature for individuals with disabilities in a train booking system can significantly improve the user experience (Anggoro, 2024). By using the designed methodology and user experience, this system can be tailored to the specific needs of people with disabilities, thereby facilitating better accessibility in public transportation. In addition, AI also plays a role in improving the accessibility of public services.

A study on the accessibility of SIM service facilities for people with disabilities showed that although some facilities and infrastructure have been provided, special officers are still needed to serve people with disabilities so that services can be carried out more optimally (Amara et al., 2021). This shows that technology, including AI, can be used to train officers to provide better services and be more responsive to the needs of people with disabilities. In the context of education, AI can help create a more inclusive learning environment. Research shows that children with disabilities have the same right to get a decent education (Faiq, 2024). By leveraging AI technology, educational institutions can develop curricula tailored to individual needs, as well as provide more effective learning tools. For example, AI-based applications can be used to detect learning difficulties and provide timely interventions.

Furthermore, AI can also be used to increase the participation of people with disabilities in social and political activities. Research on the political participation of people with disabilities shows that many barriers must be overcome to increase their involvement in the democratic process (Febriantanto, 2019). By using AI to analyze data and provide more inclusive policy recommendations, it is hoped that a more supportive environment can be created for people with disabilities to actively participate. Overall, the application of AI in various aspects of the lives of people with disabilities shows great potential to improve their accessibility, education, and social participation. With the support of the right technology, people with disabilities can be more independent and empowered, and fully obtain their rights in society.

## CONCLUSION

The future of AI in enhancing the lives of individuals with disabilities is filled with potential. AI technologies are already making strides in breaking down barriers that people with disability face. By leveraging AI technologies in education, communication, employment, and healthcare, society can create more inclusive environments that empower individuals with disabilities to lead independent and fulfilling lives. However, it is imperative to address ethical concerns and promote equitable practices to fully realize this potential. As society continues to integrate AI into various sectors, prioritizing inclusivity will ensure that advancements benefit everyone, regardless of ability.

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