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Emerging Assistive Technologies for Persons with Disabilities: Trends, Innovations, and Future Directions

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Abstract: Assistive technologies play a crucial role in enhancing the independence, participation, and quality of life of persons with disabilities (World Health Organization [WHO] & United Nations Children's Fund (UNICEF), 2022). Rapid technological advancements over the last decade have transformed traditional assistive devices into intelligent, interconnected, and user-centered solutions. Emerging technologies such as Artificial Intelligence (AI), robotics, wearable devices, the Internet of Things (IoT), Virtual Reality (VR), Augmented Reality (AR), and Brain-Computer Interfaces (BCIs) have significantly expanded opportunities for accessibility, communication, mobility, education, and employment (Cook & Polgar, 2024). This conceptual paper examines recent trends and innovations in assistive technologies and explores their implications for disability inclusion. The paper discusses major technological developments, their applications across various disability categories, and the opportunities they create for social participation and empowerment. It further highlights key challenges, including affordability, accessibility, digital literacy, ethical concerns, and policy limitations. Finally, the paper identifies future directions for research, policy, and practice aimed at ensuring equitable access to emerging assistive technologies. The paper contributes to the growing discourse on technology-enabled inclusion and underscores the importance of collaborative efforts among governments, researchers, technology developers, and social work professionals in advancing disability rights and social justice (United Nations, 2006; WHO & UNICEF, 2022).

Keywords: Assistive Technology, Disability Inclusion, Artificial Intelligence, Accessibility. Emerging Technologies, Rehabilitation, Social Work, Digital Inclusion.

Introduction

Disability is increasingly recognized as both a public health issue and a development concern with significant implications for social inclusion, human rights, and economic participation. According to the World Health Organization (WHO), approximately 1.3 billion people, or nearly 16% of the global

population, experience significant disability, making it one of the largest minority groups worldwide (World Health Organization, 2022). Persons with disabilities often face multiple barriers in accessing education, healthcare, employment, transportation, information, and community participation. These barriers frequentlycontribute to social exclusion, reduced economic opportunities, and lower quality of life.(United Nations, 2006).

In recent decades, assistive technology has emerged as a key enabler of participation and inclusion for persons with disabilities. Assistive technology encompasses products, devices, systems, and services designed to maintain, improve, or enhance functional capabilities and independence (World Health Organization & United Nations Children's Fund [UNICEF], 2022). Traditional assistive technologies, including wheelchairs, hearing aids, walking aids. prosthetic devices, and Braille systems, have long played an important role in supporting mobility, communication, and daily functioning. However, advances in digital technology have substantially expanded the scope and potential of assistive solutions.

The convergence of artificial intelligence (AI), robotics, wearable computing, sensor technologies, cloud-based systems, and digital communication platforms has transformed the assistive technology landscape. Emerging technologies are increasingly capable of providing personalized, adaptive, and context-sensitive support to users. For example, Al-powered applications can assist individuals with visual impairments through object recognition and text-to-speech functions, while intelligent wheelchairs and robotic prostheses can enhance mobility and independence. Similarly, wearable devices and Internet of Things (IoT)-enabled systems facilitate health monitoring, environmental control, and communication, thereby enabling greater participation in education, employment, and community life (Cook & Polgar, 2024; Hersh, 2021).

These developments reflect a broader shift in disability discourse from a deficit-oriented perspective toward approaches that emphasize empowerment, participation, and rights.
Consistent with the principles of the United Nations Convention on the Rights of Persons with Disabilities (CRPD), assistive technologies are increasingly viewed not merely as compensatory tools but as mechanisms for promoting accessibility, autonomy, and social inclusion (United Nations, 2006). As technological innovations continue to evolve, they offer new opportunities to address longstanding barriers and support the realization of equal opportunities for persons with disabilities.

Despite their considerable potential, access to assistive technologies remains uneven across countries and populations. The WHO and UNICEF (2022) estimate that millions of individuals who could benefit from assistive products are unable to obtain them because of high costs, limited availability, inadequate service provision, insufficient awareness, and policy constraints. Additional concerns relating to digital literacy, technological infrastructure, privacy, and data security further influence the adoption and effectiveutilization of emerging assistive technologies. These challenges are particularly pronounced in low and middle-income countries, where disparities in healthcare resources and technological access continue to affect persons with disabilities disproportionately (Borg et al., 2018).

Against this backdrop, the present paper examines emerging assistive technologies and their growing role in supporting persons with disabilities. Specifically, it

explores recent technological innovations, their applications across different disability categories, and their contribution to accessibility, independence, and social participation. The paper also discusses challenges associated with the adoption of assistive technologies and highlights future directions for research, policy, and practice. By bringing together contemporary developments in the field, this paper seeks to contribute to ongoing discussions on disability inclusion and the transformative potential of technology in promoting participation, dignity, and social justice.

Objectives of the Study

The objectives of this conceptual paper are:

- To examine the concept and evolution of assistive technologies for persons with disabilities.
- To explore recent trends and innovations in assistive technology.
- To analyze the applications of emerging assistive technologies across different disability categories.
- To identify challenges and barriers affecting the adoption and accessibility of assistive technologies.
- To discuss future directions and implications for policy, practice, and social work interventions.

Conceptual Understanding of Assistive Technology

Assistive technology refers to products, devices, systems, and related services designed to maintain, improve, or enhance the functional capabilities of individuals experiencing limitations in mobility, communication, cognition, vision, hearing, or other aspects of daily functioning (World Health Organization [WHO] & United Nations Children's Fund [UNICEF), 2022). The concept extends beyond physical devices and encompasses a wide range of technological solutions that enable individuals to participate more fully in education, employment, healthcare, and community life.

Assistive technologies include mobility aids such as wheelchairs, walkers, and prosthetic devices, sensory aids such as hearing aids, cochlear implants, screen readers, and Braille displays, communication supports such as augmentative and alternative communication systems; and cognitive technologies designed to assist individuals with intellectual and developmental disabilities (Cook & Polgar, 2024). These technologies vary in complexity. ranging from low-tech devices to advanced digital systems incorporating artificial intelligence, robotics, and connected technologies.

The significance of assistive technology extends beyond addressing functional limitations. Research has demonstrated that appropriate assistive technologies can enhance independence, improve educational attainment, facilitate access to employment, strengthen social participation, and contribute to improved health and well-being (WHO & UNICEF, 2022). Access to assistive technology is increasingly recognized as a prerequisite for exercising fundamental human rights, including the rights to education, work, information, mobility, and community participation (United Nations, 2006).

Contemporary approaches to assistive technology are grounded in principles of accessibility, user-centered design, and inclusion. Rather than focusing exclusively on impairments, modern assistive technologies seek to support individuals in achieving greater autonomy and participation within their environments. This shift reflects broader developments in disability studies, where disability is understood not only as a medical condition but also as a product of social and environmental barriers (Oliver, 2013).

Recent advances in digital innovation have expanded the possibilities of assistive technology considerably. Artificial intelligence, wearable computing, robotics, virtual reality, and Internet of Things (IoT)-enabled systems are transforming traditional assistive devices into adaptive and intelligent solutions capable of responding to users' changing needs and circumstances (Hersh, 2021). As a result, assistive technology has become an increasingly important component of inclusive development and disability empowerment initiatives worldwide.

Conceptual Framework

Understanding the contribution of emerging assistive technologies to disability inclusion requires a theoretical framework that recognizes both the social dimensions of disability and the opportunities created through technological innovation. This paper draws upon the Social Model of Disability and the Capability Approach. Together, these perspectives provide a useful foundation for examining how assistive technologies can reduce barriers, expand opportunities, and enhance participation among persons with disabilities.

Social Model of Disability

The Social Model of Disability emerged as a critique of the traditional medical model, whichlargely viewed disability as an individual problem resulting from impairment. In contrast, the Social Model argues that disability arises primarily from environmental, institutional, and attitudinal barriers that restrict participation and create disadvantage (Oliver, 2013). According to this perspective, inaccessible infrastructure, discriminatory practices, inadequate policies, and limited opportunities contribute significantly to the exclusion experienced by persons with disabilities.

Within this framework, assistive technologies can be understood as mechanisms for reducing barriers and facilitating participation. Technologies such as screen-reading software, speech-recognition systems, smart mobility devices, and accessible communication platforms enable individuals to engage more effectively in education, employment, healthcare, and social activities. Consequently, the value of assistive technology extends beyond technical functionality and should also be assessed in terms of its contribution to accessibility. inclusion, and equal participation (Shakespeare, 2018).

The Social Model further emphasizes that responsibility for inclusion does not rest solely with individuals but also with governments, institutions, communities, and technology developers. Ensuring that assistive technologies are affordable, accessible, and responsive to users' needs is therefore an essential component of creating inclusive societies.

Capability Approach

The Capability Approach, developed by Sen (1999) and further elaborated by Nussbaum (2011), offers a complementary perspective by focusing on individuals' opportunities and freedoms to achieve valued ways of living. Rather than measuring well-being solely in terms of resources or outcomes, the approach emphasizes what individuals are actually able to do and be within their social contexts. From a capability perspective, disability may limit opportunities; however, appropriate support systems, social arrangements, and assistive technologies can enhance an individual's capabilities and expand participation. Technologies such as smart wheelchairs, assistive communication devices, navigation systems, and adaptive learning platforms increase individuals’ ability to

access education, employment, healthcare, and community life.

The Capability Approach highlights the importance of equity in access to resources that support human development. In the context of assistive technology, this implies that access should not be determined by economic status, geographic location, gender, or other social factors. Equitable access is essential for ensuring that persons with disabilities have meaningful opportunities to participate fully in society and pursue lives they value.

Evolution of Assistive Technologies

The development of assistive technologies reflects a long-standing effort to enhance the functioning, independence, and social participation of persons with disabilities. Historically. assistive devices were primarily mechanical in nature and designed to compensate for specific functional limitations. Early examples included canes, crutches, wheelchairs, prosthetic limbs, hearing aids, and Braille systems, which played a crucial role in supporting mobility, communication, and access to information (Cook & Polgar, 2024). Although these technologies significantly improved daily functioning and independence, their capabilities were often limited by the technological resources available at the time.

The latter part of the twentieth century witnessed significant advances in information and communication technologies, resulting in a major transformation of the assistive technology landscape. The emergence of personal computers, digital communication systems, and electronic devices facilitated the development of more sophisticated assistive solutions. During this period, technologies such as screen readers, speech-recognition software, electronic Braille displays, and augmentative and alternative communication (AAC) systems became increasingly available, enabling persons with disabilities to access information, communicate more effectively, and participate more fully in educational and occupational settings (Scherer, 2019). These developments marked a shift from purely mechanical aids to technology-assisted solutions that addressed a wider range of functional needs.

In the twenty-first century, rapid advancements in digital innovation have further expanded the scope and effectiveness of assistive technologies. The integration of artificial intelligence (AI), machine learning, robotics, sensor technologies, cloud computing, wearable devices, and the Internet of Things (IoT) has given rise to intelligent and adaptive assistive systems capable of responding to users' individual preferences and environmental conditions (Hersh, 2021). Unlike traditional assistive devices, many contemporary technologies are designed to learn from user interactions, provide real-time feedback, and support personalized experiences. Examples include AI-powered visual assistance applications, smart hearing devices, robotic prostheses, intelligent wheelchairs, and connected home systems that facilitate independent living.

The evolution of assistive technology also reflects broader changes in the understanding of disability. Earlier approaches largely focused on compensating for impairments and restoring functional abilities. Contemporary perspectives, however, emphasize empowerment, accessibility, participation, and inclusion. This shift is closely aligned with rights-based approaches to disability, particularly those reflected in the United Nations Convention on the Rights of Persons with Disabilities (CRPD), which recognizes access to assistive technology as an important means

of promoting equality, autonomy, and full participation in society (United Nations, 2006). Consequently, modern assistive technologies are increasingly viewed not only as tools for overcoming functional limitations but also as mechanisms for advancing social inclusion, human rights, and independent living.

As technological innovation continues to accelerate, assistive technologies are becoming more personalized, interconnected, and user-centered. Emerging developments in artificial intelligence, virtual and augmented reality, brain-computer interfaces, and smart environments suggest that future assistive solutions will further transform opportunities for participation and inclusion among persons with disabilities. Understanding this evolution is essential for appreciating the growing role of technology in shaping inclusive and accessible societies.

Emerging Assistive Technologies

Recent advances in digital innovation have transformed assistive technology from traditional devices into intelligent, adaptive, and interconnected systems that promote independence, accessibility, and social participation among persons with disabilities (Cook & Polgar, 2024; World Health Organization [WHO] & United Nations Children's Fund [UNICEF], 2022).

Artificial Intelligence (Al)

Artificial Intelligence (Al) supports personalized assistance through machine learning, natural language processing, and computer vision. Al-powered applications assist with object recognition, navigation, speech recognition, communication support, and adaptive learning, thereby enhancing accessibility and participation (Hersh, 2021; Sharma & Gupta, 2023).

Wearable Technologies.

Wearable technologies, including smart watches, smart glasses, sensor-based clothing, and hearing devices, provide real-time monitoring, navigation support, health tracking, and communication assistance. These technologies contribute to independent living and rehabilitation outcomes (Patel et al., 2022).

Robotics and Exoskeletons

Robotic prostheses, rehabilitation robots, and powered exoskeletons improve mobility. physical rehabilitation, and independent functioning. These technologies enable more natural movement and support individuals with mobility impairments and spinal cord injuries (Bogue, 2021).

Internet of Things (IoT)

IoT-enabled assistive technologies create smart environments where users can control household devices, access emergency support, and manage daily activities through connected systems. Such technologies enhance safety, accessibility, and independent living (Al-Khalifa & Al-Salman, 2021).

Virtual Reality (VR) and Augmented Reality (AR)

VR and AR technologies are increasingly used in rehabilitation, education, and skills training. While VR provides immersive environments for therapeutic and learning purposes, AR enhances real-world experiences through contextual digital information and guidance (Freina& Ott, 2020).

Brain-Computer Interfaces (BCIs)

Brain-Computer Interfaces (BCIs) enable direct communication between the brain and external devices, offering new possibilities for communication, mobility,

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and environmental control among individuals with severe motor impairments and neurodegenerative conditions (Wolpaw&Wolpaw, 2019).

Applications of Emerging Assistive Technologies Across Disability Categories

The application of emerging assistive technologies varies according to the functional needs and environmental contexts of persons with disabilities. Advances in artificial intelligence, robotics, wearable devices, virtual environments, and communication technologies have expanded the range of support available across different disability categories. These innovations not only address specific functional limitations but also promote participation, independence, and inclusion in education, employment, healthcare, and community life (WHO & UNICEF, 2022).

Visual Impairments

Individuals with visual impairments have benefited significantly from advances in digital and Al-driven assistive technologies. Screen readers, electronic Braille displays, optical character recognition systems, and text-to-speech applications facilitate access to digital information and educational resources (Hersh, 2021). More recently, Al-powered object recognition applications and smart glasses have enabled users to identify objects, recognize faces, read printed text, and navigate unfamiliar environments in real time.

Navigation technologies incorporating global positioning systems (GPS), computer vision, and wearable sensors further support, independent mobility by providing auditory guidance and obstacle detection. Such innovations contribute to greater autonomy and participation in daily activities, education, and employment.

Hearing Impairments

Emerging technologies have substantially enhanced communication opportunities for individuals with hearing impairments. Modern hearing aids and cochlear implants utilize digital signal processing and adaptive algorithms to improve sound quality and speech perception in diverse listening environments (Cook & Polgar, 2024).

In addition, speech-to-text applications, automatic captioning systems, and real-time translation technologies have increased access to information and communication across educational, professional, and social settings. Mobile applications equipped with Al-based transcription capabilities can convert spoken language into text almost instantaneously, thereby facilitating more effective interaction and participation.

Physical Disabilities

For individuals with physical disabilities, technological innovation has significantly expanded opportunities for mobility and independent living. Smart wheelchairs equipped with sensors, autonomous navigation systems, and obstacle-avoidance technologies enable users to move more safely and efficiently within different environments (Bogue, 2021).

Robotic prosthetic devices and powered exoskeletons have further transformed mobility assistance by improving movement control, balance, and physical functioning. Voice-controlled interfaces, adaptive computer technologies, and environmental control systems also enable individuals with mobility impairments to access digital resources and manage daily activities with greater independence.

Intellectual and Developmental Disabilities

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Assistive technologies are increasingly being used to support learning, communication, and daily living among individuals with intellectual and developmental disabilities. Educational software, adaptive learning platforms, visual scheduling applications, reminder systems, and cognitive support tools can facilitate skill development and independent functioning (Alper & Goggin, 2017). Al-enabled educational technologies are particularly useful in providing individualized instruction and adapting content to users' learning needs. These systems support academic achievement, social participation, and vocational development by offering personalized learning experiences and structured support.

Autism Spectrum Disorders

Emerging technologies have demonstrated considerable potential in supporting individuals with autism spectrum disorders (ASD). Digital communication tools, social skills training applications, and virtual reality interventions are increasingly being used to enhance social interaction, communication, and emotional regulation (Parsons & Cobb, 2011).

Virtual reality environments provide safe and controlled spaces where individuals can practice social situations, develop communication skills, and build confidence before applying these skills in real-world settings. Additionally, sensory regulation technologies and wearable devices can help individuals monitor and manage sensory experiences, thereby improving comfort and engagement in educational and community environments.

Multiple Disabilities

Individuals with multiple disabilities often require complex and integrated support systems. Recent technological developments have enabled the creation of multifunctional assistive solutions that combine communication, mobility, cognitive support, and environmental control features within a single platform (WHO & UNICEF, 2022).
Integrated assistive systems can be customized to address the diverse and evolving needs of users, thereby promoting greater independence and participation. The convergence of Al, IoT, wearable technologies, and adaptive interfaces is expected to further enhance the effectiveness of support available to individuals with complex disabilities.

Benefits and Opportunities of Emerging Assistive Technologies

The growing integration of emerging technologies into disability support systems has generated significant benefits for individuals, families, communities, and society. Beyond addressing functional limitations, assistive technologies contribute to empowerment, participation, and improved quality of life.

One of the most significant benefits is the promotion of independence. Assistive technologies enable individuals to perform daily activities, communicate effectively, access information, and navigate their environments with reduced reliance on caregivers or support personnel (WHO & UNICEF, 2022). This increased autonomy contributes to enhanced self-confidence and personal agency. Emerging technologies also improve access to education and employment. Digital learning platforms, communication technologies, adaptive software, and workplace accommodations support academic achievement and workforce participation among persons with disabilities. Increased access to education and employment opportunities can contribute to economic empowerment and social mobility (United Nations, 2006).

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Another important benefit is enhanced social participation. Assistive technologies facilitate communication, community engagement, and access to social networks, thereby reducing social isolation and promoting inclusion. By improving connectivity and interaction, these technologies strengthen opportunities for meaningful participation in family, community, and civic life. From a health perspective, wearable devices, rehabilitation technologies, and remote monitoring systems support preventive healthcare, rehabilitation, and long-term health management. These technologies enable continuous monitoring of health conditions and facilitate timely interventions, thereby contributing to improved health outcomes and overall well-being. Emerging assistive technologies also generate broader societal and economic benefits. Increased workforce participation, reduced dependency, enhanced productivity, and improved educational attainment can contribute to economic development and social progress. Moreover, the widespread adoption of accessible technologies supports the realization of human rights principles and advances broader goals of equity, inclusion, and sustainable development.

Ultimately, the value of emerging assistive technologies extends beyond technological innovation itself. Their significance lies in their capacity to expand opportunities, strengthen capabilities, and support the full participation of persons with disabilities in all aspects of social, economic, and community life.

Challenges and Barriers to the Adoption of Emerging Assistive Technologies

Despite considerable advancements in assistive technologies, several challenges continue to limit their accessibility, adoption, and effective utilization among persons with disabilities (World Health Organization [WHO] & United Nations Children's Fund [UNICEF], 2022).

Economic Barriers

The high cost of advanced assistive technologies, including robotic prosthetics, exoskeletons, and Al-powered systems, remains a major obstacle. Limited insurance coverage, inadequate government support, and maintenance expenses further restrict access, particularly in low-and middle-income countries (WHO & UNICEF, 2022).

Accessibility and Availability Challenges

Access to assistive technologies is often uneven across regions. Rural and underserved communities frequently face shortages of assistive products, rehabilitation services, trained professionals, and technical support. Inadequate digital infrastructure and internet connectivity also affect the use of many modern assistive technologies.

Access Gap and Unmet Needs

A substantial gap continues to exist between the demand for and availability of assistive technologies worldwide. Many individuals who require assistive products are unable to obtain them due to financial, geographic, institutional, and informational barriers. This unmet need negatively affects education, employment, independence, and social participation (WHO & UNICEF, 2022).

Technological Limitations

Several assistive technologies continue to face challenges related to battery life, software compatibility, maintenance requirements, reliability, and rapid technological obsolescence. Additionally, technologies developed without sufficient user involvement may not adequately

address the needs of persons with disabilities (Cook & Polgar, 2024).

Ethical and Privacy Concerns

The growing use of artificial intelligence, cloud computing, and connected devices raises concerns regarding privacy, data security, informed consent, and surveillance. Protecting users' personal information and ensuring ethical technology development remain important priorities (Hersh, 2021).

Social and Cultural Barriers

Social stigma, discrimination, and limited awareness about disability and assistive technologies may discourage their adoption. Cultural attitudes and misconceptions regarding disability can further influence the acceptance and effective use of assistive devices.

Policy and Regulatory Challenges

Many countries lack comprehensive policies and funding mechanisms to support equitable access to assistive technologies. Weak implementation of disability legislation, fragmented service delivery systems, and limited regulatory standards often hinder the availability. affordability, and quality of assistive products (United Nations, 2006).

Implications for Social Work Practice

The growing integration of assistive technologies into disability services has significant implications for social work practice. As professionals committed to social justice, inclusion, and human rights, social workers play a vital role in ensuring that persons with disabilities can access and benefit from technological innovations (United Nations, 2006). Social workers can support individuals and families through assessment, referral, counselling, and guidance regarding appropriate assistive technologies while considering their unique needs and environmental contexts.

Furthermore, social workers have an important advocacy role in promoting equitable access to assistive technologies and addressing barriers related to affordability, accessibility, and digital exclusion. They can contribute to digital literacy initiatives, community-based rehabilitation programs, and disability-inclusive service delivery systems that enhance participation and independent living (World Health Organization [WHO] & United Nations Children's Fund [UNICEF], 2022). The rapidly evolving nature of assistive technology also highlights the need for social workers to engage in research, evaluation, and interdisciplinary collaboration with healthcare professionals, educators, engineers, and rehabilitation specialists. Such efforts are essential to ensure that technological innovations remain person-centered, ethically grounded, and responsive to the diverse needs of persons with disabilities.

Future Directions

- **Al-Driven Personalization:** Future assistive technologies are expected to use artificial intelligence to provide personalized and adaptive support based on users' needs, preferences, and environments (Cook & Polgar, 2024).

- **Universal Design and Inclusive Innovation:** Greater emphasis on Universal Design can promote accessibility for all users and reduce barriers associated with disability-specific technologies (Mace, 1998).

- **Affordable and Accessible Technologies:** Advances in 3D printing, open-source technologies, and low-cost manufacturing may improve the affordability and availability of

assistive devices, particularly in resource-constrained settings (WHO & UNICEF, 2022).

- **Smart Homes and Smart Cities:** The integration of assistive technologies within connected environments can enhance safety, mobility, and independent living for persons with disabilities (WHO & UNICEF, 2022).

- **Advances in Brain-Computer Interfaces (BCIs):** Continued developments in BCI technologies may improve communication, mobility, and environmental control for individuals with severe disabilities (Wolpaw&Wolpaw, 2019).

- **Ethical and Human-Centered Development:** Future innovations should prioritize privacy. autonomy, transparency, and the active involvement of persons with disabilities in technology design and implementation (United Nations, 2006).

- **Strengthening Research and Policy:** Ongoing research and supportive policy frameworks are essential to ensure the effectiveness, affordability, accessibility, and equitable distribution of assistive technologies (WHO & UNICEF, 2022).

Conclusion

Emerging assistive technologies are transforming disability support by enhancing accessibility, independence, communication, mobility, and social participation among persons with disabilities. Advances in artificial intelligence, robotics, wearable technologies, the Internet of Things, virtual and augmented reality, and brain-computer interfaces have expanded opportunities for inclusion and improved quality of life (World Health Organization [WHO] & United Nations Children's Fund [UNICEF], 2022). Despite these advancements, barriers related to affordability, accessibility, digital inclusion, ethics, and policy continue to limit their widespread adoption. Addressing these challenges requires collaborative efforts among policymakers, researchers, technology developers, service providers, and disability advocates. Ensuring that assistive technologies are accessible, affordable, user-centered, and rights-based will be critical for promoting disability inclusion, social justice, and the full participation of persons with disabilities in society (United Nations, 2006).

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