Original Article

Social Economic Barriers to Information Communication Technology (ICT) Access for Persons with Disabilities in Africa: Literature Review

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ABSTRACT

The 2006 United Nations Convention on the Rights of Persons with Disabilities, (PWDs) enacted in May 2008, has been instrumental in championing the rights of people with disabilities. A significant aspect of the Convention is information communication technology (ICT) accessibility. Article 9 specifically calls for signatories to "promote access for persons with disabilities to new ICTs and systems, including the Internet" and to "promote the design, development, production, and supply of available ICTs and systems at a premature stage, so that these technologies and systems become accessible at an affordable price. ICT access is important for social economic incorporation of (PWDs) in Africa, with computer technology and the Internet significantly enhancing their independence. A report from the High-Level Meeting on Disability and Development at the United Nations in September 2013 underscores the importance of ICTs for the inclusion of PWDs. While inaccessible ICT designs can create barriers, innovative technologies offer unprecedented support: text-to-speech technology enables millions to access digital versions of otherwise inaccessible print documents, and new tools like GPS, image recognition, near-field communications, and Internet connectivity provide solutions for independent living. However, several socioeconomic barriers impede access to these technologies, exacerbating existing inequalities and limiting participation in the digital age. This article explores the multifaceted challenges PWDs face in accessing ICT in Africa, emphasizing the intersections of disability with poverty, education, infrastructure, and policy. It investigates the financial constraints that make assistive technologies and Internet services unaffordable, the educational barriers affecting digital literacy among PWDs, and infrastructural challenges such as inadequate ICT facilities and the lack of accessibility features in existing technologies. The article also addresses policy and regulatory gaps that fail to prioritize the needs of PWDs in national ICT strategies. By identifying these barriers, the article advocates for inclusive policies and targeted interventions to enhance ICT accessibility for PWDs in Africa. The discussion is informed by a review of relevant literature and data from various African countries. Ultimately, the article highlights the necessity of implementing policies related to ICT access and a collaborative

approach involving governments, the private sector, civil society, and international organizations to bridge the digital divide and promote the social and economic empowerment of PWDs.

INTRODUCTION

According to the United Nations Convention on the Rights of Persons with Disabilities (CRPD) (2006), ICT tools and systems should be made available to persons with disabilities to ensure they can fully enjoy their fundamental rights without discrimination. Article 9(2)(g) of the convention urges countries to take appropriate measures to ensure ICT accessibility, including the internet, for persons with disabilities. Member countries are also required to ensure that private sector service providers offer information and services in accessible and usable formats for persons with disabilities. The United Nations (2012) defines Information and Communications Technology (ICT) as any communication device or application, including radio, television, cellular phones, computers, satellite systems, as well as network hardware and software and associated services. According to the International Telecommunication Union (2022), for technology to be successful it should be human-centred. Therefore, the digitalization of processes, products, and services must be carefully planned and implemented to address the needs of all persons, regardless of age, gender, ability, or location. When technology is designed and developed to meet ICT and digital accessibility standards and the principle of universal design in technology, it allows all persons to benefit from it.

According to the Collaboration for International ICT Policy for East and Southern Africa (CIPESA) (2021), persons with disabilities have unique needs and have long been disadvantaged. As African countries become more digitally connected, the digital divide for this community appears to widen. Despite the growth in Information and Communications Technology (ICT) penetration, many persons with disabilities face digital exclusion due to the lack of access to and affordability of necessary ICT devices and apparatus, and the non-performance of telecommunication technicians in offering data and services in disability-accommodative configuration. The digital exclusion of persons with disabilities worsened during the Covid-19 pandemic, even as the crisis made technology essential for working, learning, political participation, and the enjoyment of other rights. CIPESA is working to increase the availability of information on ICT and disability in Africa by producing relevant evidence-based research, integrating disability rights issues into discussions about technology access and digital rights, building the capacity of various actors to research

and advocate for meaningful connectivity and digital accessibility, and engaging key stakeholders such as telecom companies and regional bodies.

According to the World Health Organization (2023), approximately 1.3 billion people worldwide experience significant disabilities, representing 16% of the global population. The United Nations (2019), reports that over 80 million Africans have disabilities, including mental health conditions, birth defects, and other physical impairments. Individuals with disabilities are a diverse group, and their experiences and health needs are influenced by factors such as sex, age, gender identity, sexual orientation, religion, race, ethnicity, and economic situation.

Scanlan (2021), noted that people with disabilities (PWDs) face barriers at the basic level of obtaining and using appropriate equipment, such as standard computers, tablets, or smartphones. For instance, someone with a cognitive delay may not understand what equipment they need to connect to the internet or how to acquire it, while someone with a physical handicap cannot utilise input devices. These often-overlooked barriers can be daunting even for those with the desire and means to connect to the internet.

Early studies by Kaye (2000), NTIA (2000), Lenhart et al. (2003), and Dobransky &Hargittai(2006), identified a digital divide between people with various disabilities and those without disabilities. Kaye noted, people with disabilities are the single segment of society with the most to gain from new technologies of the electronic age and yet they have among the lowest rates of use of these technologies.

In Africa, several studies were carried out on barriers to ICT access among persons with disabilities as outlined:

According to the Collaboration for International ICT Policy for East and Southern Africa (CIPESA) (2019), the East African region has experienced considerable growth in the use of Information and Communications Technologies

(ICT). As of March 2019, Kenya had a mobile penetration of 106%, 1 while internet subscriptions stood at 46.8 million, of which 46.7% were on broadband. In Tanzania, as of June 2019, the mobile penetration was 81% and internet penetration 42%.2 As of December 2018, the rates for Uganda were 63% and 37% respectively. Despite this growth in internet penetration, senior citizens and people living with disabilities are often among the least likely to access related devices because either the equipment lacks the necessary accessibility features or because assistive software and hardware remain unaffordable.

Raja (2016), explored the disability divide across many countries and demonstrated that this divide is a global phenomenon. She also discussed how people with disabilities (PWDs) are at an additional disadvantage during disasters due to their lack of access to ICTs. She outlined three crucial areas that need to be addressed for PWDs during a crisis including mitigation and preparedness, alerts and response, recovery and reconstruction.

Wentz et al. (2011) and Jaegar (2011) paint a grim picture, showing that many websites are designed without considering PWDs and are later retrofitted to be compliant. These technology lags can be frustrating for disabled users due to the given rapid pace of technological change and introduction of new Web-enabled technologies hence online technologies are often obsolete before they are made accessible.

A study conducted by Moyo (2024) reviewed adequate laws and regulations, recognised challenges to ICT availability and utilisation, and suggested targeted supports to ensure digital inclusivity for the handicap sector in South Africa. Moyo categorized these barriers into several types: infrastructural, financial, technological, socio-cultural, educational, implementation, and enforcement barriers. Issues included the digital divide between rural and urban areas, the high cost of assistive devices, the lack of universally accessible devices and platforms, and social stigmas that hinder the efficient utilisation of ICTs

by people with special needs. Additionally, inadequate enforcement mechanisms, insufficient government support, limited availability of data, and low levels of digital literacy among persons with disabilities exacerbate these barriers.

Indongo & Mufune (2015), conducted a study in Namibia on ICT barriers for persons with disabilities, revealing that people with disabilities are disadvantaged in terms of ICT access. The study found that factors such as education level, work status, age, and place of residence were significantly associated with ICT access among people with disabilities. There was less disparity in ICT access between employed and unemployed individuals with disabilities compared to those without disabilities. Additionally, the study showed that individuals classified as "blind," "autistic," "hearing difficulties," and "mentally disabled" faired worse than others in accessing computers, the internet, and/or cell phones. The study highlighted the potential of ICTs to provide economic and social services, such as banking, healthcare, education, emergency management, and social participation, in low and middle-income countries. Proper promotion and implementation of ICTs can ensure more equal opportunities for social and economic participation and prevent further marginalization and exclusion of people with disabilities.

Role of ICT among Persons with disabilities in Africa

According to Kaaniru (2023); United Nations (2021), the rise of Machine Learning (ML) and Artificial Intelligence (AI) in Africa offers an opportunity to improve the lives of Persons with Disabilities (PWDs) by enhancing their ability to communicate, learn, move, live independently, and access digital services equally.

Ponelis & Holmner (2015), argue that ICT offers numerous delivery systems that can increase both access to and the quality of education across Africa. These systems include online and mobile platforms for learning, flexible lifelong learning opportunities, expanded access to library resources, increased regional and international knowledge sharing, teaching ICT skills for employment, and connecting to the African diaspora for educational content and research support. They highlight that the combination of education and ICT can be a powerful driver for growth on the African continent and should be a high priority on all African countries' development agendas. In developing economies in the Global South, ICT compensates for a lack of infrastructure and helps develop new products and services for a rapidly expanding customer base.

Malik, Elbatal & Khan et al. (2024), emphasize that technology can overcome barriers and enable people, especially those with disabilities, to achieve a better socio-economic lifestyle by supporting access to information, knowledge, and technology, which are basic rights of citizens. Technological access facilitates better integration into the community through support for learning and communication within educational, personal, and administrative environments. Modern applications such as mobile, internet, software, apps, beneficial websites, and social apps have revolutionized education, healthcare, and the professional world, creating digital spaces of accessibility and inclusion. These advancements help overcome barriers to information access and communication connectivity, reaching people regardless of their location or identity and thus connecting and involving people with disabilities without creating societal divides based on exclusion.

Socioeconomic barriers to ICT access in Africa

According to United Nations (2012); International telecommunication union (ITU) (2022), there are a variety of barriers to ICT access in Africa and they include: Institutional barriers, which include legislation, practices, or processes that actively limit accessibility for people with special needs. Despite having some progressive laws and policies, there has been laxity in implementing them. Structural barriers, which forbid accessibility for people with special needs to physical surroundings such as houses, road networks, and several interior and exterior

institutions such as educational institutions, residences, hospitals, sporting venues and workplaces. Informational barriers, which prevent access for persons with disabilities, particularly for those with visual or intellectual impairments, to both the form and content of information that may be provided on websites, brochures, books, television, among many other ways that information is presented in society.

According to the United Nations (2012); the International Telecommunication Union (ITU) (2022), various barriers impede ICT access in Africa. Institutional barriers including legislation, practices, or processes that actively prohibit or fail to facilitate access for persons with disabilities. Despite the existence of progressive laws and policies, there is often a lack of implementation. Physical barriers prevent access for persons with disabilities to physical environments such as buildings, roads, transportation, and various facilities like schools, housing, medical centres, sporting venues, and workplaces. Informational barriers hinder access for persons with disabilities, especially those with visual or intellectual impairments, to both the form and content of information available on websites, brochures, books, television, and other media. Communication barriers make it challenging for persons with disabilities to fully participate in society. This includes the absence of sign language interpretation for deaf individuals, inaccessible technology such as television without captioning, or websites that screen readers cannot access. Attitudinal barriers consist of negative attitudes and a lack of understanding about disability issues, which are some of the most pervasive obstacles to equal access. Many persons with disabilities lack the necessary knowledge and skills to use specialized devices. Cultural barriers may prevent persons with disabilities from fully engaging in community life. These include myths and stereotypes about disability that are culturally ingrained and lead to discrimination.

According to the International Telecommunication Union (2022) and CIPESA (2019), affordability is often cited as a major barrier to Internet access and usage in Africa. Many regions experience a lack of progress in extending access and network coverage, with affordability declining due to high costs of getting online and purchasing mobile devices. Article twenty of the CRDP advocates for efficient methods to enhance accessibility to standard assistive technologies at cheaper prices as required based on the specific needs of people with special needs. The lack of disaggregated data on ICT usage by persons with disabilities hampers efforts to improve their access to services, information, and resources. This aligns with Goal 17 of the SDGs, which stresses the need for high-quality, timely, and reliable data disaggregated by disability to strengthen social development programs. Persons with disabilities often face adverse socio-economic outcomes compared to those without disabilities, including less access to information, lower education levels, poorer health outcomes, lower employment rates, and higher poverty rates. Contributing factors to this digital exclusion include a non-conducive legal and policy environment, poor investments in telecommunication infrastructure, and lack of access to necessary assistive technologies like screen readers, screen magnifiers, and braille.

A 2022 GSMA study in Ghana revealed that PWDs are 34% less likely to have a mobile phone and 72% less likely to own a Smartphone. Mobile internet usage is also significantly lower among PWDs, at 16% compared to 61% for those without disabilities. The primary obstacles for PWDs include device costs, literacy challenges, and disability-related limitations. These factors hinder PWDs from fully benefiting from digital technologies, which could otherwise enhance their independence and quality of life.

Legal Framework of ICT Access for PWD's in Africa

Several African countries have made legal and policy improvements regarding disabilities. For instance, Nigeria's Discrimination Against Persons with Disabilities (Prohibition) Act 2018 mandates special consideration for persons with disabilities, including emergency

communications. Kenya's Persons with Disabilities Act of 2003 ensures access to information and communications, supported by the National ICT Policy for an accessible ICT environment. Nigeria's 2007 Consumer Code of Practice Regulations requires telecommunication companies to consider disabled consumers' interests. South Africa's Code on Persons with Disabilities, revised in 2019, includes proposals for subtitling TV programs, billing statements in large print and Braille, affordable compliant handsets, cheaper hearing aids, and Braille airtime vouchers (ITU, 2022).

The United Nations' Convention on the Rights of Persons with Disabilities (CRPD) (2006) introduced ICT accessibility as a key concept in the context of disability rights. The CRPD views accessibility not only as a fundamental right for individuals with disabilities but also as essential for realizing all other rights. It emphasizes the importance of accessibility in various aspects of life, including physical, social, economic, cultural, health, education, and communication domains. Accessibility is both a general principle and a specific article (Article 9) in the Convention. Article 9 outlines the obligations of participating countries to ensure accessibility for people with disabilities, enabling them to live independently and fully participate in society. It requires nations to take appropriate steps to provide equal access to physical environments, transportation, information and communications (including technologies and systems) and also public facilities and services in both urban and rural areas.

The article also mandates the identification and removal of accessibility barriers in various settings, such as buildings and roads, schools, housing, medical facilities, work places, emergency services and other public facilities and services. Article 9's scope extends beyond government entities to include private organizations offering public services or facilities. This comprehensive approach aims to ensure accessibility for people with disabilities in all aspects of society, regardless of location or service provider (United Nations, 2012).

The United Nations (2012), emphasizes the critical need for many countries to establish or update national and sector-specific accessibility standards to fully implement the Convention on the Rights of Persons with Disabilities (CRPD). The member countries should assess their current legislation in close collaboration with people with disabilities and their representative organizations to determine compliance with the CRPD. They should develop comprehensive accessibility standards which should be incorporated into legislation covering all aspects of accessibility like physical environment (construction and planning), transportation (buses, boats, airplanes), information and communications (telecommunications, audio/video)services. They should ensure inclusivity whereby standards should provide accessibility for all while considering the diverse range of disabilities. The application of these accessibility standards should be required by law. The accessibility standards should also be included in anti-discrimination and equality legislation. These laws should aim to eliminate access barriers that constitute direct and indirect discrimination, assign responsibilities to both public and private entities and introduce various measures to ensure equitable access to all rights.

Rules and guidelines concerning inventions must incorporate conditions of universality. Countries need to revise their current legal frameworks to recognize accessibility as a human right. The ongoing global transformation necessitates new rules and guidelines addressing inventions use, presenting a unique opportunity to establish a foundation for inclusive digital transformation. Two essential steps must be taken. First, existing laws, regulations, and policies should be revised to assess if inventions is identified as a facilitator of digital transformation. Where invention use is addressed, it is crucial to ensure that ICT attainability is mandated and defined within the framework. Second, all new rules and guidelines recognizing ICT as a digital transformation

enabler must include a clear definition of availability. In the first step, it is advisable to reference the Convention on the Rights of Persons with Disabilities when defining the scope of the legal framework under revision. Articles 9, 21, and 30 of the Convention guarantee equal access to ICTs for persons with disabilities (ITU, 2022).

Interventions to enhance ICT Inclusivity for PWDs in Africa

Technological advancements are important but they are insufficient on their own to bridge the socioeconomic gaps faced by people with disabilities. The successful use of ICT (Information and Communication Technology) for inclusive development depends on various factors within the broader ecosystem, including stakeholder awareness of available ICT solutions, existing laws and policies and also the capacity of stakeholders to support accessible ICT services. If it is not designed to be accessible and inclusive, the use of internet and ICT can actually increase the inequalities between people with and without disabilities. The UN Convention on the Rights of Persons with Disabilities, the advocates for adopting a Universal Design approach which involves designing products, environments, programs, and services to be usable by all people to the greatest extent possible, without the need for adaptation or specialized design to enhance inclusivity. This approach can help address inequities and remove barriers in both online and physical environments. Universal Design can be applied to web-based content, where user agents provide author-generated content, as well as various types of software applications (Raja, 2016; ITU, 2019).

Raja (2016) highlights two significant trends that are reshaping how technology can promote inclusion and full participation of people with disabilities. Internet and ICT are key channels for development and are being utilised for governance, welfare, socioeconomic development, and human rights programming. They help in poverty reduction by enabling direct producer-market interactions globally, providing new methods for quick, personalized public and social services, creating different channels for income generation and innovating in asset accumulation and access to finance. They also help in improving transparency, accountability, and monitoring of development programs through multiple information access and contribution channels such as utilizing various communication methods: email, text messaging, voice, and video. Mainstreaming ICT with built-in accessibility features whereby mobile phones and computers include functionalities that aid people with disabilities. The specialized features include text-to-speech and voice recognition, adjustable contrast and colour schemes, touch and gesture input and screen magnification. Digital technologies allow customizable information formats for instance in case of visual impairments there is speech-to-text for website reading. Incase of hearing impairments there is short message service (SMS) or instant messaging for communication and incase of mobility impairments there is voice recognition for device operation and navigation.

Nganji (2008) emphasized the need to include everyone in ICT use regardless of their ability or disability. He suggested the anticipation of various disabilities in ICT implementation and the inclusion of PWDs in user testing of ICTs. He also highlighted the cost-effectiveness of incorporating accessibility from the start, rather than retrofitting.

Gachambi (2016) noted an increased recognition by African governments of the importance of digital inclusion for PWDs. Whereby there has been development of Disability and ICT strategies and also policies aimed at ensuring equal internet access for PWDs. There has also been recent initiatives carried out by technology companies to design products and services considering PWDs' needs.

CIPESA Framework (2023), developed a set of indicators for monitoring and assessing countries' performance in implementing ICT and Disability Rights obligations. Based on international and regional human rights standards, including the Convention on the Rights of Persons with

Disabilities, Sustainable Development Goals 9c, ITU's Model ICT Accessibility Policy Report 2014 and National laws and regional legal/policy instruments. The framework covers five broad indicators including legal and regulatory framework, accessibility framework for public access mobile communication accessibility, television and video programming accessibility and web accessibility.

ITU (2022), states that ICT accessibility is a measurement of which a commodity or resource can be used by people with special needs as effectively as it can be used by a person without special needs for purposes of accessing or using ICT related products, content or services and is one of the factors that can promotes ICT inclusivity. This theory also applies to legislature, laws and regulations that promote the creation and provision of available and cheaper ICTs, while ensuring their suitability and acceptance by all individuals. The reference resource for addressing ICT accessibility is the 2021 publication entitled "Towards building inclusive digital societies: ITU toolkit and self-assessment for ICT accessibility implementation". This material is an invaluable guide for all teams that want to solve the issue of digital availability implementation and also will assist in facilitating the execution procedure while offering customized regulations and important appropriate applications at every step of the execution procedure.

ITU (2022) provides valuable insights into ICT accessibility and inclusivity for people with disabilities (PWDs). ICT Accessibility measures how effectively a PWD can use an ICT product or service compared to someone without that disability and it applies to legislation, policies, and regulations thus ensuring accessible and affordable ICTs. ITU toolkit and self-assessment for ICT accessibility implementation provides guidelines, good practices, and monitors support for digital accessibility implementation. Policy and regulations need continuous revision to in order to keep pace with evolving accessible technologies and must incorporate inclusivity requirements for services like e-health, e-education, and e-government. The ITU model ICT accessibility policy report offers guidance on public ICT access, mobile communications, Television/video programming, web accessibility, public procurement and also provides a framework for countries to develop institutional structures for ICT accessibility. Products and services should have embedded accessibility features from the design stage which must be attainable, understandable, usable by people with a wide range of abilities and compatible with assistive technologies. CT services and equipment must comply with accessibility requirements to ensure inclusivity

CIPESA (2019) outlines several key recommendations for ensuring ICT inclusivity for people with disabilities (PWDs). Existing disability legal frameworks must be strictly enforced and penalties should be implemented for non-compliance. Clear accountability measures and oversight responsibilities should also be established. Disability rights activists and supporters should prioritize inclusion from the early stages of all interventions whereby accessibility features should be incorporated into websites during development. Investing in data collection and research in order to understand the extent of disability In the African continent. Lack of disaggregated data limits the effectiveness of programming and monitoring efforts. Incorporating disability concerns across all sectors like academia, research, and funding will ensure widespread understanding of PWDs' situations and exclusion issues. Development partners should make an inclusion of PWDs as a mandatory requirement for grantees in their programming and interventions. National governments should collaborate with the private sector, especially entrepreneurs and telecom companies in order to provide accessible and affordable services for PWDs through these partnerships. Projects like "Harnessing ICTs for Education 2030" funded by UNESCO Weidong Group aim to promote inclusive and equitable use of ICTs as such initiatives support the achievement of Sustainable Development Goals, particularly SDG4 by 2030.

Conclusion

In conclusion, addressing socioeconomic barriers to ICT access for persons with disabilities in Africa requires comprehensive, inclusive policy measures that target their unique challenges. Adopting a participatory approach guided by the principle "Nothing about us, without us" is crucial. This ensures genuine involvement of persons with disabilities in policymaking, integrating their needs across all relevant policies.

Achieving meaningful digital inclusion necessitates collaboration between public and private sectors through accessible engagement platforms. Policymakers must create inclusive digital ecosystems by addressing barriers to mobile digital inclusion, promoting universal design principles, increasing awareness and training, enhancing affordability, ensuring accessible education, and supporting research and innovation.

While many countries have established policies and signed the CRPD, the real challenge lies in implementation. Effective execution requires robust monitoring and evaluation frameworks, collaboration between governments, private sector stakeholders, and disability advocacy groups, and allocation of sufficient resources. By translating policies into tangible actions, we can bridge the digital divide and empower persons with disabilities to fully participate in the digital world.

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