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## Digital Accessibility as a Barrier to Inclusion of People with Special Needs

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### Abstract

This paper examines Digital Accessibility as a Barrier to inclusion of people with special needs. The opportunities to Digital Accessibilities in special needs educations in Nigeria, challenges in achieving digital accessibility in Nigeria, inclusion skills for digital Accessibility important in Nigeria, Efforts to promote digital Accessibility. Geographical Disparities in Connectivity as a Barriers to digital Accessibility. Digital Accessibility has emerged as a crucial pillar in modern education, particularly for learners with special needs. In Nigeria, the integration of digital technologies into special needs education presents transformative opportunities - ranging from personalized learning experiences to broader access to educational content. However, significant challenges such as infrastructure deficits, lack of teachers training, economic disparities, and policy gaps hinders its effective implementation. Ensuring that everyone benefit from digital economy and society; this involve providing access to affordable technology, digital literacy training and relevant support enabling individuals with special needs to participate fully, in social, economic, and educational opportunities.

**Keywords:** Digital Accessibility, Barrier, Inclusion, People, Special Needs

### Introduction

Digital accessibility in Nigeria have become a source of worry to all who crave for equitable and accessible environment for persons with special needs children in Nigeria. The need for equitable access into the society has over the years trigged the interest of technological industries, researchers, companies, NGO'S, government, among others to improve digital inclusion. Digital inclusion in Nigeria is a critical issue to examine, considering several significant problems, primarily due to a combination of economic, social, and infrastructural barriers (Lindy, 2025). These challenges hinder access to digital technologies and limit the potential benefit of the digital's revolution for a large segment of people with special needs (Olukotun 2019). Understanding the term digital inclusion will foster a rapid growth for learners with special needs. Focusing on ensuring equitable access and participation in the digital world and effective use of digital resources such as software, hardware, assistive technology, internet communication (ICT), argumentative and alternative communication (AAC), adaptive learning platform, interactive digital games, reading and writing application among others will improve digital inclusion in Nigeria, thereby given access to inclusive education (Mohammad, 2020).

Fostering digital literacy and access to technology can empower marginalized special needs students, enabling them to participate fully in their communities and the global economy. Addressing the barriers that prevents persons with special needs from full participation in digital world, ensuring equitable access and overall wellbeing to learning opportunities for all persons with special needs. We are concern about bridging the digital gap and creating more equitable society (Paola et al, 2025).

Promoting digital inclusion needs to be a multi-stakeholder, whole-of-society effort based on evidence and disaggregated data. Digital inclusion processes cannot be top-down but need to actively engage with the people who are most affected by them. To embrace new technologies and fully utilize them, people need to see them as inclusive, useful, and trustworthy. Incorporating the perspectives of marginalized communities currently excluded from digital spaces is crucial to harnessing the potential technologies offer to individuals and societies (Adebiyi

2020).

Participation in online learning, creating online job opportunities, developing digital literacy skills etc. basically, the idea of digital inclusion aims at providing access to meaningful digital engagement, affordable technology, digital literacy training, removing infrastructural barriers and ensuring relevant support to enable persons with special needs benefit from the digital community. This article seek to explore the challenges, barriers and opportunities of digital inclusion in Nigeria. Okebukola (2022) opined that Digital inclusion is about closing the gap between those who can readily benefit from technology and those who are left behind, and it encompasses access to devices, internet connectivity, digital literacy skills and inclusive policies. By this we mean that digital inclusion is geared towards providing access to affordable technology digital literacy training and relevant support enabling individual with special needs to participate in social, economic, and educational opportunities, it goes beyond simply having access to devices and internet, it's emphasis is on skills, content, and services that fosters meaningful digital engagement regardless of age, gender, cognitive abilities, mobility, and nationality.

Creating a society where no one is left behind in a digital era, despite the gradual growth and improvement on advocacy for digital inclusion in Nigeria, there are obvious challenges facing full participation in digital inclusion. Most persons with special needs in Nigeria are left behind especially in rural communities, efforts to ensure equity and access to technology is the hall mark.

### Definition of Digital Inclusion

Digital Accessibility is the ability for individuals with special needs to access and use information and communication technologies (ICTS). It enables the persons with special needs to learn to communicate and connect with the world around. The Digital inclusion is a critical component of modern education. For students with special needs, digital tools offer unprecedented opportunities for personalized learning. it is the act of ensuring everyone regardless of their background or abilities, has equitable access to digital technologies, services, and opportunities to participate fully in the digital world. (Okebukola, 2022). Digital inclusion is about closing the gap between those who can readily benefit from technology and those who are left behind, and it encompasses access to devices, internet connectivity, digital literacy skills and inclusive policies. By this we mean that digital inclusion is geared towards providing access to affordable technology digital literacy training and relevant support enabling individual with special needs to participate in social, economic, and educational opportunities, it goes beyond simply having access to devices and internet, it's emphasis is on skills, content, and services that fosters meaningful digital engagement regardless of age, gender, cognitive abilities, mobility, and nationality.

Digital inclusion is enabled by human rights-based, intersectional, and whole-of-society policies and multi-stakeholder approaches and actions, that take into account the various barriers individuals face when accessing and experiencing digital technologies. Adetoro (2020) said that Human rights are to be promoted, protected, respected, and enjoyed online as they are offline, and the specific needs of individuals need to be taken into consideration in the digital world so as not to leave anyone behind. Digital inclusion should aim to dismantle existing structural social inequalities and enhance well-being for all. It must aim for inclusion that is equitable, so that everyone online has the same opportunities and that marginalized communities are not left behind. For everyone who wants to be connected, we should guarantee the availability and accessibility of the Internet, digital devices, services, platforms, and relevant content; affordable access to them and to critical digital and other skills, education, and tools; and equitable participation in safe, discrimination-free online spaces, with the opportunity to create content and consider and involve different groups in the design, development, testing, and assessments of digital devices, services, platforms, and policies (Adebayo, 2018).

Digital inclusion in Nigeria refers to ensuring all citizens have access to and can effectively use digital technologies, like the internet and mobile devices, to participate in social, economic, and civic life (Yusuf 2019). It should address the digital divide, which separates those who can access and utilize digital technologies from those who cannot, promoting social and economic development and bridging societal gaps. Digital inclusion refers to the ability of individuals and communities to access and use digital technologies effectively, confidently, and safely in all aspects of life. Nwosu (2021) opined that it goes beyond simply having an internet connection or owning a smartphone; it's about ensuring that people have the skills, tools, and support they need to fully participate in the digital age.

A digital economy, as defined by the European Commission, is an economy that "encompasses businesses that sell goods and services via the internet, and digital platforms that connect spare capacity and demand"<sup>1</sup>. Digital inclusion involves the activities necessary to ensure equitable access to and use of information and communication technologies for participation in social and economic life, including education, social services, health, and social and community participation <sup>2</sup>. Digital economy sustainability may be defined as "actions that employ digital

technologies creatively to meet sustainable development goal (Alberico, 2023).

Digital economy has been identified as a precursor to development and economic growth in the future. It is a reflection of how an economy has been able to develop business or trade transactions that utilize the internet as a means of communication and its ability to initiate collaborations between companies and individuals. It is hinged on the world's increase in the use of information and technology, which is becoming globalized (Adrinna, 2025).

Digital inclusion, as defined by the National Digital Inclusion Alliance (NDIA), 2024. Refers to activities required to provide all individuals and communities, including the most disadvantaged, with access to and skills to use Information and Communication Technologies (ICTs), even as they evolve. In a world that is more digitally connected than ever, digital inclusion plays a significant role in fostering global participation and collaboration towards increased economic development. In a paper measuring the impact of the internet on economic growth, it was found that the more participants a country or continent has with access, the higher its chances for economic development. According to the same paper, a 10% increase in internet users increases GDP per capita growth by 8.04%. (Ebosetale, 2024).

The global move towards digital inclusion has seen several strategies created to help countries reach their goals. One of such strategies is the Fourth Industrial Revolution (4IR), which builds upon the Digital Revolution or the 3rd Revolution. With the 3rd Revolution, the goal was to increase access to and adoption of digital technologies such as mobile phones, social media, and the internet. The purpose of the 4IR, on the other hand, is to build on these available digital technologies to improve industries and societal development through innovations in critical areas such as artificial intelligence (AI), big data and analytics, cloud computing, and cyber-physical systems (Lindy, 2025).

Understanding this premise reveals the impact of digital inclusion on a country's technology sector's ability to innovate, compete, and exist sustainably. For countries that have achieved a certain level of success with the 3rd Revolution, the adoption of 4IR-related innovations and startups becomes easier. In Nigeria, however, the region with the highest population of people without internet access (over 860 million people), technology adoption is limited to the few with access. When most people in a place lack primary access to the internet or digital skills, innovating in more advanced areas could be limited or slowed by market size, thus affecting success potential. Digital inclusion is, therefore, necessary to attain technological growth. Along with investments in startups, becoming more intentional about bringing more Nigerians online should be a major focus (Adriana, 2025).

However, collaboration between technology companies, social institutions, non-profit organization and communities is essential to identify and address barriers to digital inclusion in Nigeria (Oloyede 2021). In Nigeria a country grappling with socio-economic and infrastructural challenges, digital inclusion for special needs education presents both significant promise and notable obstacles.

### Opportunities of Digital Inclusion in Special Needs Education in Nigeria

Digital inclusion in Nigeria presents several opportunities for growth and development particularly in leveraging mobile technology for education, health care and economy empowerment. Mobile phone serves as primary tools for internet access, especially in rural areas. Offering a part way to bridge digital divide. Unlocking digital services can transform the lives of persons with disability in Nigeria, opening doors to education, job opportunities, civic engagement, and greater independence, ultimately enhancing their overall well-being as follows.

1. **Enhanced access to learning:** digital technologies offer customized learning experiences. Tools such as screen readers, speech to text software and interactive educational application can cater for diverse disabilities including, visual impairment, hearing impairment, cognitive and mobility impairments. These tools help bridge the gap between traditional education and students' individual needs (Adetoro, 2020 ).
2. **Improved communication:** for children with communication difficulties, digital devices can act as augmentative and alternative communication (AAC) tools these facilitate better interaction with peers, teaches and care givers promoting inclusion and reducing isolation, thereby enhancing communication (Yusuf, 2019).
3. **Teacher Support and Training:** online platforms can provide teachers with training on inclusive teaching strategies and access to global communities of practice. This helps educators stay current with pedagogical innovations in special needs education. Also, open virtual classroom whereby student in rural areas can be reached (Omeigbe, 2021).
4. **Flexible Learning Environments:** E-Learning platforms and digital content enable learning beyond the physical classroom, especially critical in rural or underserved areas. Student can learn at their own pace in environment tailored to their comfort.
5. **Policy Support and International Partnerships:** growing interest from NGOS, international bodies like UNICEF, and private technology companies has led to pilot project and donations aimed at improving digital infrastructure in Nigeria special education.

6. **Economic Growth:** Digital inclusion stimulates opportunities for job market.
7. **Health Care Access:** Digital inclusion can improve healthcare information, remote consultations and health monitoring, particularly in underserved area.
8. **Mobile Phone:** Phones are key drivers for digital inclusion in Nigeria with 83 million people benefiting from information exchange, increased productivity, and access to essential services.

### Challenges in Achieving Digital Accessibility in Nigeria Inclusion

Although internet penetration has improved over the decades, challenges remain in Nigeria that hinder its wider adoption of digital inclusion, including factors such as

1. **Inadequate Infrastructure:** many Nigeria schools, particularly in rural areas, lack basic infrastructure like electricity, internet connectivity and functional computers. These limitations hinder the effective implementation of digital learning for special needs student (Adetoro, 2020).
2. **Lack of Specialized Digital Tools:** most educational technology tools available in Nigeria are not adapted for special needs education. There is a shortage of devices and software tailored to various disabilities, which restricts the scope of digital inclusion.
3. **Limited Teacher Training:** there is a significant gap in teachers' preparations to the use of ICT in special needs education. Many educators are not equipped with the skills to integrate digital tools into their teaching methods effectively (Nwosu, 2021).
4. **Cost and Affordability:** devices and assistive technologies are often expensive. With most Nigerian Families and schools is operating in tight budgets, acquiring and maintaining these tools becomes a major barrier.
5. **Policy Implementation Gaps:** while Nigeria has several education policies referencing inclusive education, practical implementation is weak funding, monitoring and enforcement remain inconsistent, and special education often receives limited attention in national ICT initiatives (Federal Ministry of Education, 2020)
6. **Digital Literacy:** Tailored digital literacy programmes are needed to equip individuals with the necessary to utilize digital technology effectively.
7. **Online Safety:** Strengthening cyber security measures and promoting online safety awareness is vital for a safe digital environment.

### Skills for Digital Inclusion

Digital inclusion skills are essential for individuals to fully participate in today, digital world. Here are some skills.

1. **Basic Computer Skills:** Understanding how use a computer, including typing navigating the internet and using basic software application.
2. **Online Security and Safety:** Knowing how to protect personal data, avoid online scams, and use strong passwords.
3. **Communication Skills:** Being able to effectually use digital communication tools, such as email, massaging applications and adapt to new technologies.
4. **Information Management:** Knowing how to find, evaluate and manage digital information effectively
5. **Content Creation:** Ability to create digital content, such as writing, mages, or videos and understanding copy right and licensing.
6. **Accessibility Awareness:** Understanding how to use digital tool that are accessible and inclusive for people disabilities.
7. **Digital Citizenship:** Understanding the social and ethical implications of digital technology and online behavior. These among others are skills crucial for digital inclusion of persons with special needs into economic, and society development. Lindy 2025.

### Why is Digital Inclusion Important in Nigeria?

1. **Economic Growth:** Digital technologies are drivers of economic growth, and digital inclusion can help unlock Nigeria's economic potential by enabling businesses, improving productivity, and creating new opportunities.
2. **Social Development:** Access to digital technologies can improve access to education, healthcare, and other essential services, particularly for those in remote or underserved areas.
3. **Empowerment:** Digital inclusion empowers citizens by providing access to information, enabling participation in public life, and fostering civic engagement (Yusuf, 2019).
4. **Reducing Inequality:** By bridging the digital divide, digital inclusion can help reduce social and economic inequalities, promoting a more inclusive society.

### Efforts to Promote Digital Inclusion

1. **Government Initiatives:** The Nigerian government has launched initiatives like the National Digital Economy Policy and Strategy (NDEPS) to promote digital inclusion and develop the digital economy.
2. **Public-Private Partnerships:** Collaborations between government, private sector companies, and NGOs are crucial to addressing the challenges of digital inclusion, particularly in infrastructure development and digital literacy training. Lindy 2025.
3. **Community Programs:** Community-based initiatives, such as digital literacy training programs and access to public internet centres, play a vital role in reaching underserved populations.

### Geographical Disparities in Connectivity as Barriers to Digital Inclusion

Access to reliable internet is often taken for granted in urban areas, but for many rural communities, it remains a significant barrier to digital inclusion. Across the UK, gaps in digital infrastructure create stark inequalities between urban and rural regions, affecting education, businesses, and everyday life.

Geographical Disparities in Connectivity as Barriers to Digital Inclusion - wires on a wall.

In rural areas, access to modern broadband technologies is often limited. Only 52% of rural UK regions have access to full-fibre broadband, compared to much higher coverage in urban areas. Similarly, just 16% of rural areas are covered by 5G networks, leaving many residents dependent on outdated or slower technologies. This lack of infrastructure restricts opportunities to participate fully in the digital economy.

The consequences of poor connectivity are far-reaching. Approximately 12% of rural premises in the UK cannot access superfast broadband, compared to just 1% in urban areas. In parts of rural Wales and Scotland, broadband speeds frequently fall below 10 Mbps, making even basic online activities challenging. For students, it means limited access to online learning resources. For businesses, it restricts opportunities to adopt digital tools for growth. For residents, it creates barriers to essential services, such as telemedicine and online banking.

Mobile network coverage presents another layer of disparity. While urban areas enjoy near-universal indoor 4G access, rural England lags behind, with indoor coverage rates between 73% and 83%. Many rural households must rely on multiple network providers to achieve even basic coverage, highlighting the inconsistency in service availability.

Globally, geographical disparities are even more pronounced. According to the ITU, 83% of urban populations have internet access, compared to just 48% of rural residents. This urban-rural divide is particularly severe in low-income countries, where investments in digital infrastructure remain inadequate. While 95% of the global population theoretically has access to 3G or 4G networks, many rural areas lack the infrastructure to make this a reality. ITU'S latest Data 2021.

Advanced technologies like 5G illustrate the gap further. In high-income countries, 84% of people have access to 5G, but only 4% in low-income nations can say the same. This leaves rural communities in less developed regions reliant on slower, less reliable networks, which hinders education, healthcare, and economic activity. These geographical disparities highlight how digital exclusion disproportionately affects rural and remote populations, limiting opportunities and deepening inequalities.

### Digital Accessibility Barriers to Inclusion for People with Disabilities

For individuals with disabilities, digital accessibility remains a significant barrier to inclusion. Despite technological advancements, many websites, applications, and digital tools fail to meet accessibility standards. This leaves millions excluded from the opportunities of the digital world.

A report on “Accessibility Monitoring of Public Sector Websites and Mobile Apps” (2022–2024) uncovered more than 29,787 accessibility issues across 1,203 websites and 21 mobile apps. Common problems included insufficient colour contrast, poor keyboard navigation, and layouts that failed to adapt to different devices or magnification levels. Alarming, 73% of public sector websites did not meet the WCAG 2.1 AA standards. This highlights systemic accessibility challenges that persist across digital platforms.

Mobile apps showed slightly better responsiveness, with 84% of identified issues resolved after testing. However, significant barriers remain. Frequent issues include the lack of screen reader support, inaccessible forms, and unresponsive menus. These design flaws exclude millions of users, particularly those with visual or motor impairments, from accessing critical services and platforms. Encouragingly, approximately 70% of public sector organizations addressed accessibility concerns after receiving feedback. While this progress reflects growing awareness, the remaining gaps underscore the need for more comprehensive and consistent efforts.

The scale of the challenge is immense. In the UK, 16.1 million people—24% of the population—reported having a disability in the 2022/23 financial year. This statistic underscores how many individuals face barriers that limit their participation in the digital age.

Globally, the situation is even more stark. According to the 2024 WebAIM Million report, 95.9% of websites analyzed had detectable WCAG 2 failures, with an average of 56.8 errors per page. Common issues include low-contrast text, missing alternative text for images, unlabeled form inputs, and empty buttons or links. These barriers not only hinder usability but also expose organizations to legal risks and reduced audience engagement. Websites in developing countries face even greater accessibility challenges. A 2023 study revealed significantly higher rates of non-compliance compared to developed nations (webAIM million, 2024).

Digital exclusion has profound consequences. A visually impaired individual unable to navigate a government website may miss out on essential benefits. Similarly, someone with motor impairments might struggle to complete online forms, limiting their independence and exacerbating social isolation. Accessible design is essential. Features like screen reader compatibility, alt-text for images, and voice commands improve usability for individuals with disabilities and enhance the digital experience for all users. Overcoming these challenges is vital to building a truly inclusive digital society. One where everyone, regardless of their abilities, can fully participate and benefit.

## Conclusion

Digital inclusion in special needs education hold transformation potential in Nigeria. While significant challenges persist, ranging from infrastructure gaps to policy inefficiencies strategic action by stakeholders can turn technology into a powerful equalizer for learners with special needs. Ensuring no child is left behind in the digital age is not just a moral imperative, but a necessary step towards an equitable and inclusive educational system.

In Nigeria, there is no current data on the state of disabilities or policies governing the digital rights of persons with disabilities. So, while the digital world continually advances, they trail behind their peers due to the absence of digital inclusion efforts that account for their unique needs. This lack further reduces their access to education, work, and a means of income, leaving them in poverty. Addressing the issue of digital inclusion for persons with special needs in Nigeria is not just a matter of providing access to technology; it is about creating equitable opportunities for all young persons living with disability by implementing targeted initiatives that promote digital literacy and access to resources, we can empower these individuals to thrive in an increasingly digital world. We call upon NGOs, community organizations, businesses, and individuals to join us in this vital mission.

Together, we can bridge the digital divide and ensure that persons with disability are not left behind in this technological age. Let us work collaboratively to create a future where all marginalized special needs will have the opportunity to succeed through digital inclusion. Your support can make a significant difference in transforming lives and building stronger communities for generations to come.

## Recommendations

1. **Government Investment:** Targeted investment in digital infrastructure and subsidized assistive technology for special needs education is essential. Government partnerships with technology firms could enhance affordability and access of digital inclusion.
2. **Teachers Training and Curriculum Development:** Special education teachers training must include ICT integration, with a curriculum that promote digital literacy for both teachers and students.
3. **Community and NGO Engagement:** Civil society and non-governmental organizations can play a key role in advocacy. Provision of resources and awareness campaigning to highlight the importance of digital inclusion.
4. Inclusive policy design and monitoring policies must be intentionally inclusive, with mechanisms for accountability, data collection, and community feedback to ensure the needs of students with disabilities are met.

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