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Digital Inequality And The New Development Divide In Africa: A Review of Nigerian Experience From Access To Advantage

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Abstract

Digital expansion across Africa has intensified debates on whether connectivity alone is sufficient to drive inclusive development, particularly in countries marked by deep socio-economic inequality such as Nigeria. This paper examined digital inequality and the emerging development divide in Africa through a critical review of the Nigerian experience, with specific attention to the shift from digital access to digital advantage. The objectives of the paper were to analyse the nature and extent of digital inequality in Nigeria, situate the Nigerian experience within the broader African development context, examine how variations in digital access shape socio-economic advantages, and assess the factors influencing the effectiveness of digital inclusion policies in Nigeria. Anchored in Amartya Sen's Capability Approach, the paper conceptualised digital technologies as resources whose development value depends on people's ability to convert access into meaningful socio-economic outcomes. The study adopted a systematic review methodology relying on secondary data drawn from peer-reviewed scholarly literature and authoritative institutional sources selected through clearly defined inclusion and exclusion criteria. The findings reveal persistent regional, income and educational disparities in digital access and use, with evidence that increased connectivity has not translated into equitable development benefits. Instead, digital inequality reinforces existing socio-economic divides by limiting the ability of disadvantaged groups to utilise digital tools for education, employment and

economic participation. The paper concluded that addressing digital inequality in Nigeria requires a shift from infrastructure-centred strategies to capability-enhanced interventions. It therefore recommended integrated policies that prioritise digital skills development, affordability, regional equity in infrastructure provision and alignment of digital inclusion initiatives with broader socio-economic development strategies.

Keywords:

Digital Inequality, Development Divide, Digital Access, Digi Advantage, Afran Economy, Nigerian Experience.

Introduction

In the 21st century, digital technology has come to underpin economic growth, social participation and governance across the world. The extent to which individuals, communities and nations can access and benefit from digital technologies is increasingly recognised as both a development indicator and a determinant of socio-economic opportunity. For African countries seeking to harness digital transformation for inclusive growth, the challenge of digital inequality has sharpened into a critical issue. Digital inequality refers not only to the uneven availability of internet connectivity and devices but also to differences in the quality of access, affordability, and the capacity to use digital technologies meaningfully. In Nigeria, Africa's most populous country, this inequality persists despite considerable investments in telecommunications infrastructure and mobile network expansion. As of early 2024 and into 2025, Nigeria's overall internet penetration rate remained below 50 per cent of its estimated population, meaning that over 100 million Nigerians still lacked regular access to the internet (Gbadebo, 2025). This offline majority is indicative of a broader digital divide that undermines inclusive participation in education, employment, financial services and democratic processes.

While national statistics paint a picture of growth in connectivity, with active mobile connections exceeding 205 million and a moderately rising broadband penetration rate, these aggregate figures mask deep regional and socio-economic disparities. Urban centres such as Lagos, Abuja and Port Harcourt have emerged as vibrant digital hubs, often surpassing 50 per cent internet use, while rural communities frequently experience connectivity levels below 25 per cent and sometimes as low as 20 per cent (Gbadebo, 2025). These disparities are corroborated by regulatory data showing that broadband coverage has expanded unevenly: although the national broadband penetration may have reached approximately 50.58 per cent by late 2025, rural and underserved regions remain far below national averages due to limited fibre-optic networks, high deployment costs and persistent vandalism of infrastructure (Nigerian Communications Commission data cited in Nigeria CommunicationsWeek, 2025). The resultant urban–rural digital chasm means that millions of Nigerians residing outside metropolitan areas are effectively excluded from opportunities to engage with digital markets, online learning platforms and essential e-government services.

Beyond differences in physical access, digital inequality in Nigeria encompasses affordability and capability gaps that exacerbate exclusion (Gillwald et al., 2019). High data costs relative to average incomes make sustained online participation untenable for many low-income families

and rural households, particularly when a significant share of household budgets is expended on basic data bundles. Even where network coverage exists, costs remain prohibitive for marginalised populations, constraining their ability to move from simple connectivity to productive use. This situation is compounded by disparities in digital literacy and device ownership: for example, rural schools and teacher-training institutions often lack basic digital devices, further entrenching educational inequalities and limiting the potential for technology-enhanced learning among future workforces (ITU and National Information Technology Development Agency data cited in ICERT, 2026). Moreover, women and other disadvantaged groups tend to have lower device ownership and internet use, reflecting broader socio-economic inequities that intersect with the digital divide.

The consequences of persistent digital inequality are far-reaching. As Nigeria strives to deepen its participation in an increasingly digital global economy, segments of the population that remain offline or under-equipped are denied equitable access to emerging opportunities in e-commerce, digital finance, remote work and online education. During crises such as the COVID-19 pandemic, for example, lack of reliable digital access hindered continuity of learning and economic activity for students and micro-enterprises in under-served areas, magnifying pre-existing social divides. Digital exclusion also impedes participation in civic life, where online platforms are now integral to information dissemination and public discourse. Economists suggest that expanding broadband penetration can contribute to national economic growth by stimulating productivity and innovation; yet, Nigeria's uneven digital adoption threatens to concentrate these benefits among already advantaged populations, thereby creating a new development divide within and beyond national borders.

Despite abundant documentation of access disparities and their implications, a significant gap remains in how research connects the dots between digital access and the translation of that access into measurable development advantage. Much of the existing studies by Gillwald et al. 2019; Adeleke (2021); Gbadebo (2025) among others focused on infrastructure deficits and access rates, but less attention has been given to how unequal digital capabilities affect socio-economic mobility, labour market outcomes and entrepreneurial success across Nigeria's diverse regions. There is also a need for updated empirical analysis that situates Nigeria's experience within broader African trends, especially in comparison with neighbouring countries where digital inclusion efforts have taken different forms. This paper sought to bridge that gap by reviewing not only the extent of digital inequality in Nigeria but also how such inequality affects the ability of individuals and communities to convert access into real socio-economic advantage. In doing so, the review will highlight barriers to inclusive digital participation and provide evidence-based recommendations for policy and practice.

Aim and Objectives

The aim of this paper was to critically examine digital inequality in Nigeria as a key driver of the emerging development divide in Africa, with particular attention to how disparities in digital access, usage and capability influence the ability of individuals and communities to convert connectivity into socio-economic advantage.

The specific objectives of this paper include:

i. To examine the nature and extent of digital inequality in Nigeria within the broader African development context.
ii. To analyse the socio-economic factors influencing disparities in digital access and use across regions in Nigeria.
iii. To assess how differences in digital access affect development advantages such as education, employment and economic participation in Nigeria.
iv. To identify the challenges of existing policies on digital inclusion in Nigeria

Materials and Methods

This paper adopted a systematic review research design relying exclusively on secondary data to examine digital inequality and the emerging development divide in Nigeria within the African context. The choice of a systematic review was justified by the need to synthesise existing empirical and theoretical evidence from diverse scholarly sources in order to identify consistent patterns, gaps and explanations relating to digital access, capability and socio-economic outcomes. Relevant literature was identified through structured searches of recognised academic databases, focusing on peer-reviewed journal articles, scholarly books and authoritative institutional reports published within the last decade, with earlier foundational works included where theoretically significant.

The inclusion criteria were studies that explicitly examined digital inequality, digital access, digital skills or development outcomes in Nigeria or comparable African contexts, employed clear methodological approaches, and provided empirical or theoretically grounded insights relevant to access-to-advantage debates. Excluded from the review were newspaper articles, blogs, opinion pieces, policy briefs without empirical grounding, studies lacking clear methodological transparency, and works focusing solely on technological infrastructure without consideration of socio-economic implications. This approach ensured analytical rigour, reduced selection bias and enabled the paper to draw balanced and evidence-based conclusions on how digital inequality shapes development outcomes in Nigeria.

Literature Review

The review of relevant and related literature was done under conceptual review, empirical review and theoretical framework as follows:

Conceptual Review

Digital Inequality

Digital inequality according to scholars such as van Dijk (2005) refers to systematic differences in access to, use of, and outcomes from digital technologies, emphasising that social inequalities tend to reproduce themselves in digital environments. DiMaggio et al. (2004) further argued that inequality persists even after access is achieved, as differences in skills, autonomy of use and social support shape digital outcomes. More recently, World Bank (2021) has reinforced this position by showing that unequal digital participation is strongly associated with income,

education, gender and place of residence, particularly in developing countries. These perspectives suggest that digital inequality is not resolved by connectivity alone but is embedded in broader socio-economic structures. For the purpose of this paper, digital inequality is understood as persistent disparities in access to digital technologies, quality of connectivity, digital skills and capacity to derive socio-economic benefits from digital engagement among different population groups.

Development Divide

The concept of development divide refers to widening gaps in socio-economic progress between and within countries as a result of unequal access to growth-enhancing resources. Traditional development divides were often framed around income, industrial capacity and human capital, but contemporary scholars increasingly link development gaps to digital capability (Castells, 2010). For instance, this scholar argued that participation in networked economies determines inclusion in modern development processes, while UNDP (2023) highlights that digital exclusion limits progress in education, health and governance. Recent global development reports demonstrate that countries and regions with limited digital infrastructure and skills experience slower productivity growth and weaker social outcomes, thereby deepening inequalities in development trajectories (World Bank, 2023). In this paper, development divide is defined as the widening disparity in socio-economic outcomes between populations that are able to utilise digital technologies for advancement and those that remain constrained by limited access and digital capacity.

Digital Access

Digital access literally refers to the availability and affordability of internet connectivity, devices and digital infrastructure, advantage relates to the capacity to convert such access into tangible socio-economic gains. Van Deursen and Helsper (2015) argue that access without skills does not automatically lead to improved life chances, as digital benefits are unevenly distributed even among users. Recent empirical evidence supports this view, showing that individuals with higher digital skills and supportive environments are more likely to gain educational, economic and civic benefits from internet use (OECD, 2022; ITU, 2024). These findings underline the importance of moving beyond access-centred policies. In this paper, digital access and advantage are understood as a continuum in which physical connectivity must be complemented by digital skills, relevant content and enabling conditions to generate meaningful development outcomes.

Nigerian Experience

The Nigerian experience of digital inequality reflects broader African challenges while exhibiting country-specific features shaped by population size, regional disparities and policy implementation gaps. Despite significant growth in mobile connectivity, Nigeria continues to face stark urban–rural differences in broadband availability, affordability and digital literacy, with rural and low-income populations disproportionately excluded (World Bank, 2022). National digital development strategies have prioritised infrastructure expansion, yet evidence suggests that many Nigerians who live within network coverage areas remain offline due to cost barriers and limited digital skills (Nigerian Communications Commission, 2023). UNDP (2023) have

noted that this uneven digital participation restricts access to online education, digital finance and emerging labour markets, reinforcing existing social inequalities. In this paper, the Nigerian experience is conceptualised as a case of uneven digital inclusion where structural socio-economic conditions mediate the extent to which digital access translates into development advantage.

Nigerian Experience of Digital Inequality and New Development Divide in Africa

Nigeria's experience of digital inequality offers a compelling illustration of how uneven access to and use of digital technologies have become central to the reproduction of development disparities in Africa. Rather than serving as an equalising force, the diffusion of digital technologies in Nigeria has largely followed existing socio-economic and spatial hierarchies, thereby reinforcing patterns of exclusion that predate the digital era. Studies by Gbadebo (2025) shows that digital inequality in Nigeria is not confined to disparities in connectivity but extends to differences in digital literacy, quality of access and the capacity to translate digital tools into socio-economic advantage. This layered form of inequality has produced what can be described as a new development divide, where digital participation increasingly determines access to education, employment, markets and public services.

The geography of Nigeria's digital infrastructure reflects long-standing regional inequalities. Urban centres such as Lagos, Abuja and Ibadan among others benefit from dense broadband coverage, multiple service providers and relatively stable electricity supply, while many rural and economically marginalised areas experience weak network coverage and high service costs (Adeleke, 2021). These disparities are not accidental but are shaped by market-driven investment decisions that prioritise profitability over equity. As a result, digital expansion has been concentrated in areas already advantaged by higher income levels, educational attainment and economic activity. This pattern mirrors broader African trends, where digital infrastructure development often reinforces existing cores of growth rather than fostering spatially inclusive development.

The social consequences of this divide became particularly visible during the COVID-19 pandemic, when access to digital technologies became essential for educational continuity. Evidence from Nigeria indicates that students in rural and low-income households were largely excluded from remote learning due to lack of devices, poor connectivity and limited digital skills, while students in well-resourced urban schools continued learning online (Education Partnership Centre & Nigerian Economic Summit Group, 2021). This episode demonstrated how digital inequality can rapidly translate into educational and social disadvantage, with potential long-term implications for human capital development. Nigeria's experience therefore underscores that digital inequality is not merely a technical challenge but a structural development issue that determines who can participate meaningfully in the digital economy and civic life, thereby shaping the contours of Africa's emerging development divide.

The Nature and Extent of Digital Inequality in Nigeria Within the Broader African Development Context

Digital inequality in Nigeria is most accurately understood as a multidimensional condition rooted in wider African development constraints rather than as a short-term gap in technological diffusion. Although national indicators often highlight rising internet penetration and mobile subscriptions, these aggregate figures obscure deep disparities across regions, income groups and social categories (Oloyede et al., 2023). This empirical evidence shows that digital access and use in Nigeria are unevenly distributed along existing socio-economic and spatial lines, reflecting structural inequalities embedded in the country's development trajectory.

In the same line of thought, Adeleke (2021) demonstrates that internet usage is closely associated with income levels, employment structure, degree of urbanisation and access to electricity, producing concentrated zones of high connectivity in economically vibrant states while leaving other regions persistently excluded. This pattern indicates that digital inequality in Nigeria is not transitional but systemic, shaped by long-standing differences in economic capacity and infrastructural investment.

Nigeria's experience aligns closely with broader trends observed across sub-Saharan Africa, where digital expansion has been uneven and socially differentiated. Data from the International Telecommunication Union (2023) show that while mobile broadband coverage has expanded rapidly across the region, meaningful digital access remains heavily skewed towards urban populations. Rural communities continue to face limited connectivity, higher costs and lower quality of service, largely due to high infrastructure deployment costs and weak commercial incentives for private investment. Gillwald et al. (2019) similarly observe that African digital markets tend to favour urban elites, producing what they describe as "digital stratification" rather than broad-based inclusion. Nigeria's large population and pronounced regional inequalities magnify these continental patterns, making digital exclusion more visible and more consequential for national development outcomes.

The extent of digital inequality in Nigeria has profound implications for socio-economic progress, particularly in relation to education, labour markets and economic diversification. Regions with limited digital access face significant barriers to participating in online education, digital finance and e-commerce, sectors that increasingly drive productivity and growth. For instance, evidence from the World Bank (2022) suggests that digitally marginalised regions across Africa experience slower economic integration and reduced capacity to participate in global value chains. In Nigeria, states with weak digital infrastructure often remain dependent on low-productivity economic activities, while digitally connected regions attract investment in services, technology and innovation. Adeleke (2021) links this divergence to uneven access to information-based services and digital tools that support entrepreneurship and labour mobility.

The Nigerian case also reflects a broader African challenge identified by Aker and Mbiti (2010), who argue that digital technologies have the potential to support development only where complementary conditions such as education, institutional capacity and market access are present. Where these conditions are absent, digital expansion risks reinforcing existing inequalities rather than reducing them. Gbadebo (2025) reinforces this argument by showing that even within

Nigeria's connected populations, differences in skills and usage patterns shape who benefits economically from digital access. This underscores the limits of access-centred development strategies that prioritise connectivity without addressing affordability, digital literacy and institutional support.

In sum, the nature and extent of digital inequality in Nigeria illustrate how digital exclusion has become intertwined with broader development divides in Africa. The persistence of unequal access and use reflects structural constraints that go beyond technology, encompassing income inequality, weak infrastructure and limited human capital development. Nigeria's experience therefore highlights the need for development strategies that move beyond connectivity metrics and address the social and economic conditions that determine whether digital technologies can contribute meaningfully to inclusive growth. Without such an approach, digital inequality will continue to mirror and reinforce Africa's wider development gaps, positioning digitally marginalised regions at a growing disadvantage in an increasingly digital global economy.

How Differences in Digital Access Affect Socio-economic Development Advantages in Nigeria

Differences in digital access and capability increasingly shape socio-economic opportunities in Nigeria, influencing educational outcomes, labour market participation and income generation. In contemporary Nigeria, access to digital technologies has become a prerequisite for participation in key socio-economic domains, including higher education, professional employment and entrepreneurship. Households with stable internet access and digital skills are better positioned to take advantage of online learning resources, digital labour platforms and information networks, thereby enhancing their human capital and economic prospects (Gbadebo, 2025).

The education sector provides a clear illustration of how digital inequality translates into unequal development outcomes. During pandemic-related school closures, for instance, students in digitally connected households continued learning through virtual platforms, while those in poorly connected areas experienced prolonged educational disruption (Education Partnership Centre & Nigerian Economic Summit Group, 2021). These disparities are likely to have lasting effects on academic performance, skill acquisition and future labour market outcomes. Similar patterns are evident in employment and entrepreneurship, where individuals with digital capability can access remote work opportunities, online marketplaces and digital financial services, while those without such capability remain excluded from these avenues.

The Nigerian digital economy further illustrates how capability mediates access and advantage. The growth of fintech, e-commerce and digital services has generated new opportunities, particularly in urban centres, yet participation in these sectors requires not only connectivity but also digital literacy and supportive infrastructure. Small-scale traders with digital skills can market products online and access mobile payment systems, whereas similar traders without such skills remain confined to local markets with limited growth potential. These dynamics confirm that digital inequality operates less as a binary of access versus no access and more as a gradient of capability, where development advantages accrue to those able to use digital tools effectively (Gbadebo, 2025).

The Socio-economic Factors Influencing Disparities in Digital Access Across Regions in Nigeria

Disparities in digital access across Nigeria's regions are fundamentally shaped by interlocking socio-economic factors that mirror broader patterns of inequality within the country. Digital participation in Nigeria is not simply a function of network availability but is closely tied to people's economic capacity, educational background, demographic characteristics and social context. These factors interact in ways that systematically privilege certain regions and social groups while marginalising others, thereby reproducing existing inequalities in digital form. Some of the factors are identified and explained as follows:

i. Income differentials

Income differentials remain one of the most decisive factors influencing regional and household-level digital access. The cost of smartphones, computers, data subscriptions and alternative power sources places sustained digital participation beyond the reach of many low-income households. Adeleke (2021) demonstrates that internet usage rates are significantly higher in wealthier states and urban centres, not only because infrastructure is more developed, but because residents can afford continuous connectivity. This pattern aligns with broader African evidence showing that affordability, rather than coverage alone, is a primary barrier to digital inclusion (International Telecommunication Union, 2023).

In Nigeria, households in low-income rural areas often rely on intermittent data purchases and shared devices, limiting the frequency and depth of digital engagement. As a result, even where mobile broadband networks exist, economic constraints restrict meaningful use, reinforcing regional disparities in digital participation.

ii. Educational inequality

Educational inequality further deepens these disparities by shaping individuals' ability to engage effectively with digital technologies. Literacy and formal schooling enhance confidence, comprehension and problem-solving skills that are essential for navigating digital platforms. Regions with higher educational attainment consistently exhibit higher levels of internet use and more diverse forms of digital engagement, including online learning, e-commerce and information seeking (World Bank, 2022). In contrast, areas with weak educational infrastructure face compounded exclusion, as low literacy reduces both the demand for digital services and the ability to benefit from them. These educational gaps intersect with Nigeria's rural–urban divide, where urban areas benefit from better schools, training institutions and exposure to digital tools. The result is a cumulative advantage for urban populations, while rural residents face layered barriers that limit both access and effective use.

iii. Infrastructure deficits

Infrastructure deficits, particularly unreliable electricity supply, further exacerbate regional digital inequalities. Consistent power is essential for device charging, network reliability and sustained internet use. In many Nigerian states, frequent power outages undermine digital participation even where network coverage exists, forcing households and small businesses to rely on costly

alternatives such as generators. Empirical studies on digital development in Africa show that electricity access is a strong predictor of internet adoption and intensity of use, especially in rural settings (World Bank, 2022). In Nigeria, this infrastructural constraint disproportionately affects regions already disadvantaged by low income and weak educational systems, reinforcing spatial inequalities in digital access.

iv. Demographic and socio-cultural factors

Demographic and socio-cultural factors also play a significant role in shaping patterns of digital inclusion. Age remains an important determinant, as younger Nigerians tend to adopt digital technologies more readily due to greater exposure through education and social networks, while older populations face skill-related and attitudinal barriers (Hilbert, 2011). Gender norms further structure digital access, particularly in conservative socio-cultural contexts where women's access to education, technology and training opportunities may be constrained. Studies on gender and digital inequality in Nigeria indicate that women are less likely to own digital devices and to participate in advanced forms of digital use, such as online entrepreneurship or professional networking, even when access exists (Olatokun, 2009; World Bank, 2022). These gendered patterns limit women's ability to benefit from digital opportunities and contribute to wider gender disparities in income and employment.

Furthermore, research on second-level digital divides in Nigeria underscores that socio-economic characteristics influence not only who gains access to digital technologies but also how those technologies are used and to what effect. Gbadebo (2025) shows that individuals' income, education and demographic attributes shape the quality of digital engagement, determining whether the internet is used primarily for basic communication or for activities that enhance skills, productivity and economic mobility. This distinction is critical, as it reveals that digital inequality in Nigeria is less about simple exclusion and more about unequal capacity to convert access into socio-economic advantage.

In essence, these socio-economic factors demonstrate that regional disparities in digital access are deeply embedded in Nigeria's broader development challenges, requiring policy responses that address income inequality, educational deficits and infrastructural weaknesses alongside digital expansion efforts.

Challenges of Existing Policies on Digital Inclusion in Nigeria

Digital inclusion policies in Nigeria operate within a dense web of structural, institutional and socio-economic constraints that shape both their design and their outcomes. Although these policies are often framed in progressive and development-oriented language, their practical effects are uneven, reflecting deeper governance and development challenges within the Nigerian state. Understanding these constraints requires moving beyond policy documents to examine how ambition translates or fails to translate into lived digital inclusion across different regions and social groups.

A persistent tension exists between policy ambition and implementation capacity in Nigeria's digital inclusion agenda: National strategies such as the National Digital Economy Policy and Strategy articulate expansive goals centred on broadband expansion, digital skills development and technology-driven economic growth. However, the capacity to implement these goals is limited by fiscal constraints, competing development priorities and institutional fragmentation. Large-scale infrastructure projects, particularly broadband deployment in rural and semi-urban areas, often stall because they rely heavily on private sector investment in environments where returns are uncertain (United Nations Development Programme, 2023). Olanrewaju et al. (2021) highlight that while fibre-optic expansion has progressed rapidly in Lagos and parts of the Federal Capital Territory due to high population density and commercial activity, similar projects in states with sparse populations and lower income levels have struggled to attract sustained investment. Public funding intended to bridge this gap is frequently insufficient or inconsistently released, resulting in partial coverage and unfinished projects. This disparity illustrates how implementation capacity, rather than policy vision, determines who ultimately benefits from digital inclusion efforts.

Beyond supply-side limitations, demand-side constraints significantly weaken the effectiveness of digital inclusion policies: Oloyede et al. (2023) highlight that many initiatives assume that once infrastructure is in place, adoption will follow automatically. In practice, digital uptake is shaped by literacy levels, digital skills, trust in technology and awareness of available services. In several Nigerian communities where mobile broadband coverage exists, usage remains low because residents lack the skills to navigate digital platforms or perceive limited relevance of digital tools to their daily livelihoods. For instance, government-supported e-services for taxation, health registration or social welfare enrolment often record low participation in rural areas, not because of lack of connectivity alone, but because potential users are unfamiliar with online processes or distrust digital systems. These demand-side barriers mean that infrastructure investment, without parallel investment in digital literacy and community engagement, produces limited inclusion outcomes.

Institutional coordination and governance challenges further constrain digital inclusion policy performance: Responsibilities for digital development in Nigeria are spread across multiple ministries, agencies and regulatory bodies, often with overlapping mandates and weak coordination mechanisms. This fragmentation leads to inconsistencies in policy execution and monitoring. Delays in regulatory approvals, inconsistent spectrum management and slow implementation of universal service obligations reduce the pace and reach of digital infrastructure deployment. According to World Bank (2023), in some cases, state-level governments pursue digital initiatives that are poorly aligned with federal strategies, resulting in duplication in some areas and neglect in others. Limited data-driven monitoring also makes it difficult to assess which interventions are effective and where corrective action is needed. Consequently, digital inclusion outcomes vary widely across regions, reflecting governance capacity rather than policy intent.

These challenges point to the need for integrated policy responses that treat digital inclusion as part of a broader socio-economic development strategy rather than a standalone technological intervention. Evidence from Nigeria suggests that digital policies yield the greatest impact when infrastructure investment is combined with skills development, income support and educational

improvement. Oloyede et al. (2023) argue that without addressing underlying inequalities in education and income, digital initiatives may disproportionately benefit already advantaged groups who are better positioned to exploit new technologies. Odusanya and Adetutu (2024) opined that digital entrepreneurship programmes tend to succeed in urban centres where participants already possess basic education, capital and networks, while similar programmes in poorer regions struggle to gain traction. An integrated approach would align broadband expansion with community-based digital training, affordable access schemes and complementary investments in education and power supply. Such alignment is critical to ensuring that digital inclusion policies reduce, rather than reproduce, existing socio-economic inequalities in Nigeria

Empirical Reviews

In their 2021 study titled Left behind? The effects of digital gaps on e-learning in rural secondary schools and remote communities across Nigeria during the COVID-19 pandemic, Olanrewaju et al. (2021) investigated how digital inequality impeded educational continuity in remote states across Nigeria. Focusing on rural secondary schools in six states such as Kwara, Ekiti, Ebonyi, Bayelsa, Adamawa and Kano, the research adopted a concurrent embedded mixed-methods design that allowed quantitative and qualitative data to be analysed together under a broader digital divide framework grounded in inclusion theory and digital access scholarship. The study sampled 90 students and educators from 24 communities, selected through purposive sampling to capture contexts most affected by poor ICT infrastructure and connectivity, and used surveys along with focus group interviews to gather data on digital device ownership, internet access, electricity availability and perceived barriers to e-learning. The findings showed stark inequalities in digital access with many students lacking devices and reliable internet, compounded by unstable power supply and low socioeconomic status, which severely constrained e-learning engagement during school closures. Crucially, the authors concluded that without robust ICT strategies and infrastructure investment, rural students would continue to be marginalised from online education, exacerbating inequalities in learning outcomes. While this study contributes important empirical evidence on educational consequences of the digital divide in Nigeria, its focus on school contexts and student experiences leaves unresolved the broader question of how digital inequality continues to shape socio-economic opportunities beyond education, such as employment and access to formal digital economies, a gap that the current paper addressed by linking access to wider development advantage.

Odusanya and Adetutu's (2024) empirical work Exploring the determinants of internet usage in Nigeria: A micro-spatial approach examined the demographic, socio-economic, infrastructural and locational predictors of internet use in a nationally representative sample of households. Conducted in Nigeria with national coverage, this research stood out for using a micro-spatial analytical framework that matched geo-referenced broadband network data with survey responses from over 20,000 households, making it one of the largest empirical assessments of internet adoption in sub-Saharan Africa within information systems literature. Drawing on technology adoption theories that emphasise infrastructure availability and socio-economic enablement as key predictors, the study employed a probit regression model to evaluate how age, gender, education, employment, household expenditure and proximity to 3G/4G network equipment predicted individual internet use. The authors found that proximity to broadband infrastructure

significantly increased the probability of internet use, and socio-economic variables such as education and expenditure were consistently associated with higher adoption rates. Importantly, rural residence and lower household resources markedly reduced the likelihood of meaningful internet engagement. The study concluded that both physical infrastructure and socio-economic conditions co-determine internet usage patterns in Nigeria, highlighting the need for integrated policy interventions that combine network expansion with affordability and digital skills building. Although this research provides a robust population-level understanding of digital adoption, it does not directly analyse how adoption disparities translate into different developmental outcomes such as job access or income generation, a linkage that remains underexplored and forms part of the empirical gap addressed in the current paper

Adeleke's (2021) study Digital divide in Nigeria: The role of regional differentials offered an important empirical analysis of how internet usage varies spatially across the country and what socio-economic factors underpin these patterns. Covering all 36 states and the Federal Capital Territory, this research used spatial statistical techniques, including stepwise linear regression and Global Moran's I, to examine regional differences in internet use from 2016 to 2018. Grounded in spatial inequality and digital divide theory, the analysis revealed significant clustering of high internet usage in states such as Lagos, Oyo, Ogun, Kaduna, Kano and Abuja, while states like Ekiti, Ebonyi and Bayelsa exhibited low usage levels. Economic indicators including market size and income, along with access to electricity, urbanisation, employment and telephone density, emerged as statistically significant determinants of internet usage distribution. The study concluded that Nigeria's digital divide is not evenly distributed but reflects broader regional inequalities in socio-economic development and infrastructure endowment. This research contributes valuable empirical evidence of the geography of internet access but is limited in addressing individual-level behaviours or digital capability differences, restricting its applicability for understanding how regional differences in access translate into differential socio-economic advantage at the household or personal level, an aspect that the current paper explores in greater depth.

Gbadebo's (2025) article understanding the second-level digital divide in Nigeria: A multidimensional analysis of social media engagement investigates beyond physical access to digital technologies by focusing on patterns of social media use as a proxy for deeper digital engagement. Conducted in Nigeria with data analysed through regression and descriptive statistics, and situated within second-level digital divide theory (which posits that even with access, inequalities persist in how people use digital technologies), this quantitative design examined how socioeconomic, demographic and personality factors influence different modes of social media use among Nigerian internet users. The study did not rely on a traditional household survey but collected data targeted at users with internet access to explore entertainment, informational, social connection, utilitarian and political engagement on social platforms. Findings showed that age, education and income strongly influenced usage types and that lower-income users sometimes engaged intensively with informational content, a "reverse divide" suggesting adaptive compensatory behaviour despite resource constraints. The conclusion underscores that digital inequality in Nigeria encompasses not just access but also qualitative differences in digital use, indicating the need for tailored digital inclusion policies that emphasise literacy, content relevance, and affordability. While this research advances understanding of the

second-level divide, it is focused on social media engagement rather than broader development outcomes such as employment, income or educational attainment, leaving a gap regarding how diverse patterns of digital use translate into socio-economic advantages, a gap that the current paper filled by linking usage patterns with wider development indicators.

Theoretical Framework: Capability Approach

Amartya Sen's Capability Approach was first articulated in the mid-1980s and later consolidated in Development as Freedom (1999). The central assumption of the theory is that development should not be evaluated solely in terms of economic growth, income levels or availability of resources, but rather by people's real freedoms to achieve valued ways of living. Sen argues that possessing resources does not automatically translate into improved well-being; instead, what matters is an individual's capability to convert those resources into meaningful functionings such as being educated, being healthy, participating in social life and engaging in productive work. These conversion processes are influenced by personal characteristics, social arrangements and environmental conditions. In this sense, inequality arises not only from unequal distribution of resources but also from unequal ability to use those resources effectively.

The strength of the Capability Approach lies in its emphasis on outcomes rather than inputs. Unlike access-centred or infrastructure-focused theories, it allows scholars to interrogate why individuals with similar resources experience different development outcomes. This makes the framework particularly useful for analysing digital inequality, where internet connectivity alone does not guarantee improved livelihoods, educational attainment or economic participation. The theory is also flexible and context-sensitive, enabling its application across diverse socio-economic settings such as Nigeria, where factors like income, education, geography, gender and institutional support strongly shape digital use. Furthermore, the Capability Approach aligns well with contemporary development thinking adopted by institutions such as the United Nations Development Programme, which increasingly frames human development around capabilities rather than economic indicators alone.

However, the theory has some weaknesses. One major critique is its abstract nature, as Sen deliberately avoids providing a fixed list of capabilities, leaving researchers with the challenge of operationalising the concept in empirical studies. This can make measurement difficult and may lead to inconsistencies in application across studies. Additionally, the approach places strong emphasis on individual agency, which may underplay the role of structural power relations and political economy forces that shape access to digital infrastructure and policy outcomes. Despite these limitations, the framework remains highly influential and adaptable, particularly when combined with empirical indicators such as education, income, digital skills and employment outcomes.

The relevance of the Capability Approach to the topic "Digital Inequality and the New Development Divide in Africa: A Review of Nigerian Experience From Access to Advantage" is both direct and substantial. Digital technologies in Nigeria function as resources that have the potential to expand people's capabilities, but only for those who can effectively use them. Unequal digital access, poor quality connectivity, low digital literacy and socio-economic constraints limit the capability of many Nigerians—especially rural dwellers, women and low-

income groups—to convert digital access into development advantages such as better education, employment opportunities, access to digital finance and participation in governance. By adopting the Capability Approach, this paper is able to explain why expanding internet coverage alone has not closed Nigeria's development gaps and why digital inequality persists despite growing connectivity. The theory provides a strong analytical foundation for examining how digital access interacts with socio-economic conditions to produce unequal outcomes, thereby framing digital inequality as a development problem rather than a purely technological one. In doing so, it offers a robust lens for understanding the new development divide in Nigeria and across Africa, where the key issue is not only who is connected, but who is empowered to benefit from being connected.

Results and Discussions

The findings of this paper affirm that digital inequality in Nigeria remains a defining feature of the emerging development divide in Africa, supporting earlier empirical and theoretical arguments that access alone is insufficient for inclusive development. Consistent with Adeleke (2021) and Odusanya and Adetutu (2024), the review showed that internet availability and broadband coverage are unevenly distributed across Nigerian regions, with strong concentration in economically viable urban centres and persistent deficits in rural and peripheral areas. These disparities reflect structural socio-economic inequalities rather than purely technological shortcomings. The discussion reinforces the view advanced by Sen (1999) that resources, including digital infrastructure, do not automatically expand human well-being unless individuals possess the capability to use them effectively. For example, while mobile broadband infrastructure may pass through rural communities, many residents remain excluded from digital opportunities because of cost barriers, low literacy levels and unstable electricity supply. This explains why connectivity growth has not translated into proportional development gains across Nigeria, thereby widening rather than narrowing development gaps.

In line with the second objective, the findings demonstrate that Nigeria's digital inequality must be understood within the broader African development context, where similar patterns of uneven access and adoption persist. The evidence aligns World Bank (2022) analyses that show sub-Saharan Africa continues to lag behind other regions in meaningful digital use despite rapid mobile expansion. The Nigerian case illustrates how countries can experience rising connectivity statistics while still facing deep internal digital divides. Gbadebo (2025) provides further support by showing that even among connected users, qualitative differences in digital engagement reproduce socio-economic inequalities. Applying the Capability Approach clarifies why Nigeria's position in Africa's digital transformation remains ambivalent: digital access exists, but the conversion of access into valued outcomes such as skilled employment, entrepreneurial growth and improved public service access remains uneven. A practical example is Nigeria's fintech boom, which has generated employment and financial inclusion primarily in Lagos and Abuja, while rural populations with limited digital capability continue to rely on cash-based systems, thereby missing associated economic benefits.

Addressing the third objective, the findings show that differences in digital access and capability significantly shape socio-economic development advantages in Nigeria. The findings corroborate

Olanrewaju et al. (2021), who demonstrated how digital exclusion during the COVID-19 period deepened educational inequality, with long-term implications for human capital formation. Extending beyond education, this paper shows that digital capability influences labour market participation and income generation. Individuals with digital skills can access online job platforms, remote work opportunities and digital marketplaces, whereas those without such skills are confined to shrinking informal sectors.

Finally, in relation to the objective on socio-economic and policy factors shaping digital disparities, the discussion confirms that income inequality, education, infrastructure and institutional capacity strongly condition digital inclusion outcomes in Nigeria. The findings align with Adeleke (2021) and Oloyede et al. (2023), who argue that policy frameworks often underperform because they prioritise infrastructure rollout without adequately addressing affordability, skills development and local context.

Furthermore, Sen's Capability Approach directly supports these findings by emphasising that development outcomes depend on people's real freedoms to pursue valued goals. For instance, two small-scale traders may both own smartphones, but only the trader with digital literacy and affordable data can use social media or e-commerce platforms to reach wider markets. This distinction highlights why digital inequality translates into unequal socio-economic advantage, even when nominal access exists.

This demonstrates that the Capability Approach provides a coherent theoretical foundation for interpreting the findings, as it explains how digital inequality persists when access is disconnected from the social and economic conditions required to convert connectivity into development advantage.

Conclusion

This paper concludes that digital inequality in Nigeria remains a central driver of the new development divide in Africa, with significant implications for inclusive socio-economic progress. The findings show that although digital connectivity has expanded in recent years, access is uneven and strongly patterned by region, income, education and infrastructure. More importantly, the paper establishes that digital access does not automatically translate into development advantage. Large segments of the population, particularly in rural and economically marginalised areas, lack the skills, affordability and enabling conditions required to convert digital resources into meaningful socio-economic outcomes. Within the broader African context, Nigeria reflects a pattern where digital growth coexists with persistent inequality, thereby reinforcing existing development gaps. By adopting the Capability Approach, the paper demonstrates that digital inequality should be understood as a development challenge rooted in people's unequal ability to use digital technologies to expand their life chances. Without deliberate efforts to strengthen digital capabilities alongside access, Nigeria's digital expansion risks deepening rather than reducing socio-economic disparities.

Recommendations

Arising from the above conclusions, the paper put forward the following recommendations:

i. Digital inclusion policies in Nigeria should move beyond infrastructure expansion to prioritise capability development. Government and relevant agencies should integrate large-scale digital literacy and skills training programmes into education systems, vocational centres and community institutions, particularly in rural and underserved regions. Such interventions would enable individuals to convert digital access into economic and social benefits, including employment, entrepreneurship and improved access to public services.

ii. Affordability must be addressed as a core component of digital inclusion. Policy measures such as targeted data subsidies, reduced taxation on broadband services and incentives for low-cost device production or importation should be implemented to lower the cost of digital participation for low-income households. Reducing financial barriers will expand meaningful digital use among populations currently excluded despite network availability.

iii. Regional inequalities in digital infrastructure should be tackled through place-sensitive interventions. Public–private partnerships should be strengthened to support broadband deployment in less commercially attractive rural and semi-urban areas, complemented by investments in reliable electricity supply. Ensuring stable power and connectivity in these regions will improve the conditions necessary for sustained digital engagement and local economic development.

iv. Digital inclusion policies should be embedded within broader socio-economic development strategies. Ministries responsible for education, labour, trade and social welfare should align digital initiatives with employment creation, small business support and social protection programmes. This integrated approach will ensure that digital technologies function as tools for expanding capabilities and reducing inequality, rather than as isolated technological solutions that benefit only already-advantaged groups.

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