

# Bridging the Digital Divide for Inclusive Socioeconomic Development: Examining Root Causes, Consequences, and Policy Solutions

Sohayle M. Hadji Abdul Racman  
Mindanao State University, Marawi, Philippines

## Abstract

The digital divide is the gap between individuals, households, businesses, and geographic locations across socio-economic strata in their access to and benefits from information and communication technology (ICT) resources. This gap is one of the defining characteristics of contemporary inequity. Although technological innovations promise access and opportunities for affluent societies, several disproportionately disadvantaged groups remain at the bottom and lack the essential infrastructure and devices needed for digital participation, as well as the requisite skills and support to benefit from the advancing digital society. The digital divide has multiple aspects, and this research article aims to define its history, its relationship to inequality, and its forms, whether persistent or emergent, in broadband access, digital literacy, and the quality of technology use. Drawing on existing literature and policy reports, the article highlights the significant structural, cultural, and technological disparities that perpetuate these gaps. It examines the impact of the digital divide on education, employment, healthcare, and civic engagement. Finally, it analyzes policy goals and structures related to the Digital Divide and seeks to offer pragmatic approaches designed to facilitate inclusive digital socio-economic growth and development ecosystems. This study presents global trends and local case studies, encompassing information on several challenges and opportunities for addressing the digital divide in the 21st century.

## Keywords

Digital Divide, Socioeconomic Development, Policy Solutions

## Article History

Received on 28 Jan 2025  
Accepted on 18 Jun 2025  
Published on 28 Jun 2025

This work is licensed under a [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/).

Copyright @Author

Corresponding Author:

[sohaileyhadjiabdulracman@msumain.edu.ph](mailto:sohaileyhadjiabdulracman@msumain.edu.ph)

## Introduction

### Context and Importance of the Digital Divide

Over the past 30 years, the world has seen remarkable advances in information and communication technologies (ICTs), such as personal computers, smartphones, and high-speed internet (Dev et al., 2025; Fahlevi et al., 2024). These technological changes are increasingly associated with the broader phenomenon of globalization, affecting social, economic, and political relations worldwide (Le & Le, 2023).

Optimism results from the belief that technology has the power to equalize competition (Danaher, 2022). Digital tools enable small-scale entrepreneurs to access new markets, learners to receive quality education, and patients in remote areas to consult with medical specialists (Nipo et al., 2024). Nonetheless, the truth is much more complicated, given that

## How to Cite this Article:

Racman, S. M. H. A. (2025). Bridging the digital divide for inclusive socioeconomic development: Examining root causes, consequences, and policy solutions. *Journal of Contemporary Social Issues*, 1(1), 1–15.

millions of people worldwide lack access to even the most basic digital capabilities. This phenomenon is known as the ‘digital divide’ (Farooqi et al., [2022](#)).

The digital divide pertains to the difference between the populations who have reliable access to the internet and ICT and those who do not have access or the skills to utilize them (Adam & Alhassan, [2021](#)). However, this concept extends beyond connectivity, encompassing computer ownership, smartphone ownership, digital literacy, and the cultural or linguistic relevance of online material (Kumar, [2023](#)). Having a device and an internet connection does not mean access to the wealth of the economy through the Internet. It is clear that the unskillful utilization of ICTs results in an extreme relative disadvantage and increased inequity in education, income, and social well-being within the economy (Hidayat-Ur-Rehman, [2024](#)).

### **Socioeconomic Inequality and ICT Access**

Different socioeconomic classes derive disparate levels of income, education, and healthcare, posing within these constructs, the digital divide as a predictor and a consequence of these inequalities (Nadorff et al., [2025](#); Zhao et al., [2021](#)). Lower-income individuals may spend a disproportionate share of their budget on essential broadband services and devices, creating additional barriers to employment and educational opportunities (Merkaj et al., [2025](#)). Simultaneously, a lack of internet access or insufficient digital skills can stifle socioeconomic advancement, leading to poverty, which in turn restricts digital access. Lacking digital access perpetuates poverty (Ruiu & Ragnedda, [2024](#)). These inequalities are not limited to the Global South; developed countries also face significant inequities, often pronounced along lines of race, region, and socioeconomic status (James, [2021](#); Rydzewski, [2025](#)).

Focusing on this issue involves understanding the evolution of the workforce. Digital skills are increasingly necessary for a wide range of employment, from basic service positions to specialized technological roles (Reljic et al., [2021](#)). In the context of migration to the digital cloud and the introduction of automated systems and remote collaboration, the absence of appropriate digital skills places workers at an ever-growing disadvantage (Ciarli et al., [2021](#)).

Apart from the world of work, the digital divide also affects healthcare (including telemedicine), education (including e-learning), and civic participation (such as e-government and online public forums). Thus, closing the digital divide is more than just a technological issue; it is part of fundamental socio-economic policies.

### **Objectives and Scope of the Research**

This research article aims to provide a comprehensive examination of how the digital divide intersects with socioeconomic inequality, offering both a theoretical framework and empirical insights. Specifically, the study will:

- 1 Trace the Historical Evolution: Examine how the digital divide concept has evolved since its emergence in the 1990s, recognizing the gradual shift from a focus on physical access to a broader understanding of digital skills, usage patterns, and online content relevance.
- 2 Identify Key Barriers and Forms: Explore the various forms of the digital divide, including first-level access issues (such as broadband coverage), second-level divides centered on skills and usage, and emerging divides related to the quality and outcomes of digital engagement.

- 3 Analyze Socioeconomic Implications: Investigate how digital disparities reinforce existing socioeconomic inequalities, focusing on core areas of human development—education, employment, healthcare, and community participation.
- 4 Assess Policy and Programmatic Approaches: Highlight significant national and international initiatives that aim to tackle the digital divide, with attention to best practices, challenges, and the essential role of multi-stakeholder collaboration.
- 5 Offer Recommendations: Provide actionable recommendations for policymakers, civil society, and private sector actors on how to construct equitable, inclusive digital ecosystems.

By focusing on both high-income and developing country contexts, this article underscores the universality of the digital divide while also recognizing location-specific challenges and responses. The central thesis is that bridging the digital divide requires targeted interventions that address the root causes of socioeconomic inequality, ranging from affordable infrastructure to culturally relevant digital literacy programs. The research is grounded in interdisciplinary scholarship, drawing insights from sociology, economics, and public policy.

## Literature Review

### Conceptualizing the Digital Divide

At one point, the digital divide was understood in a rather simplistic explanation: some people had access to a computer and the internet, while others did not. For the first time, researchers such as Jamil (2021) raised the issue and highlighted the divide as a pressing problem of physical access (Aissaoui, 2022). As the Internet grew in popularity, scholars began refining the concept to encompass second-level divides, focusing on the ability to use technology at various levels and the creation of digital content at different levels (Hargittai, 2001; Ragnedda et al., 2025). More recently, van Deursen and van Dijk (2014) discussed even the third level divides, in which the results or profits obtained from Internet use tend to differ significantly between certain social classes.

What emerges from these conceptual developments is the understanding that the digital divide is multi-dimensional. It is not solely about who has a computer or a broadband connection; it is also about who possesses the skills to navigate the digital landscape effectively, who can leverage the internet for economic or educational advancement, and who receives the greatest returns from digital participation. Thus, the digital divide must be seen as an interplay among infrastructure availability and affordability, skill sets, social contexts, and the broader ecosystem of online content and services.

### Historical Evolution of the Concept

The digital divide emerged as a concern with the widespread adoption of the internet in developed countries in the late 1990s (Aissaoui, 2022). Scholars and policymakers were concerned that such inequality in access to the internet and other technological advancements of that time would exacerbate the social divide (Reljic et al., 2021).

In the year 2000, the US National Telecommunications and Information Administration (NTIA) published the pivotal 'Falling Through the Net' report (Oriishi, 2025), which highlighted the stark differences in access and usage disparities in rural as compared to urban settings, as well as the inequities across various ethnic and income groups (Ciarli et al., 2021). Around the same time, the UN began to address the 'digital divide' as a development issue, focusing on the use of ICT to reduce poverty and promote comprehensive development (Muñoz & Valencia, 2025).

Over the following decade, declining technology costs and the expansion of mobile telephony reshaped the dialogue (Jiang & Han, [2024](#)). By the early 2010s, smartphone usage had surged worldwide, including in lower- and middle-income countries (Chen, [2021](#)). This shift prompted researchers to examine how mobile connectivity, compared to fixed broadband, affected the digital divide. Studies (Donner, [2008](#); Hawthorne & Grzybowski, [2024](#)) have shown that mobile devices can bypass some infrastructural barriers but may still fall short of closing the gap in terms of actual usage quality, data affordability, and advanced skill development. Thus, while the nature of connectivity changed, socioeconomic divides persisted (Muñoz & Valencia, [2025](#)).

### **Intersection with Socioeconomic Inequality**

Extensive scholarship has established that digital inequalities mirror and intensify broader socioeconomic inequalities (DiMaggio & Hargittai, [2001](#)). Households with higher incomes tend to have more reliable internet subscriptions and the latest devices. They also have greater exposure to computer use in educational settings, from primary school through higher education, resulting in advanced digital skills (Ben et al., [2022](#)). In contrast, lower-income households, often concentrated in underserved urban or rural areas, face financial and infrastructural barriers. These households may rely solely on mobile data or free public Wi-Fi for connectivity, resulting in limited usage patterns that hinder participation in activities such as online learning or telecommuting (Oughton et al., [2021](#)).

The link between the digital divide and socioeconomic status is evident in labour market outcomes (Hawthorne & Grzybowski, [2024](#)). As e-recruitment and candidate digital profiling become standard in many industries, a lack of digital proficiency can mean the difference between securing stable employment and remaining unemployed or underemployed (Shao et al., [2021](#)). Beyond job searching, the proliferation of remote work opportunities, gig platforms, and e-commerce highlights the critical nature of reliable connectivity and digital entrepreneurship skills (Aithal, [2024](#)). For individuals and communities lacking these resources, economic prospects diminish, perpetuating cycles of poverty and marginalization.

### **Cultural and Linguistic Dimensions**

Cultural and linguistic factors also shape the digital divide. Much of the world's online (Mathrani et al., [2022](#)) content is in English, creating significant barriers for non-English-speaking populations (Pelicioni et al., [2023](#)). Even when platforms offer language localization, the depth and quality of translated or culturally relevant resources can vary widely (Le, [2024](#)). This is particularly salient in education, where comprehensive digital learning materials might not be readily available in minority languages (Taylor & Kochem, [2022](#)). As a result, entire linguistic communities can be left sidelined from the informational and economic benefits of the internet, thereby reinforcing cultural marginalization (Makananise, [2024](#)). Recent studies indicate that social media can help preserve and promote minority languages (McCarty et al., [2021](#)), but only when users already have the digital literacy skills and confidence to produce and share such content.

### **Gender and the Digital Divide**

Gender is yet another important dimension. Several studies indicate that, in most geographies, particularly in developing economies, women and girls do not have the same level of access to technology and the internet due to societal gender biases and their relatively inferior social and economic positions (Naveed et al., [2025](#); Smith & Sinkford, [2022](#)). This technology gap extends not only to obtaining a device but also to educational and professional opportunities in the information and communication technology (ICT) industry.

Having fewer women than men in STEM fields, along with the lingering perception that technology fields are “male-dominated,” can slow women's participation in ICTs. The greater the digital divide, particularly for women who do not earn autonomous income or who deal with mobility issues, the starker is the economic disempowerment and the greater the overarching inequity between men and women.

### **The Emergence of Broadband Quality and Speed Divides**

Even among populations with internet access, there are further divisions based on the speed, reliability, and cost of the internet connection (Gallardo & Whitacre, [2024](#)). The types of content or services users can access depend heavily on the broadband speed available to them. Those slower connections are more likely to be shut out of services such as video conferencing, online gaming, or telemedicine, thus severely marginalizing them from educational, social, and health services, which are vital to them. Those engaged in remote work, as well as students who depend on contact, will be at a disadvantage if a broadband connection is not provided. Furthermore, monthly data quota limits, combined with the high costs of package deals, can compel poorer households to ration their expenditure on internet services, thereby impacting their full participation in digital activities.

### **Policy Interventions and Their Effectiveness**

The mitigation of the global digital gap through the subsidization of broadband infrastructure in remote areas, donation of low-cost data packages through partnerships with telecommunications companies, implementation of digital literacy programs in classrooms as well as community centers, and other initiatives developed by the governments, international, and the private sector, with the digitized world remains unfinished in its effectiveness (Kinoti, [2024](#)). Countries have put considerable effort into bridging the digital divide, but not all have succeeded. South Korea, for example, has nearly universal broadband access, which has been attributed to government policies that encouraged infrastructure development (Nipo et al., [2024](#)). Other countries, however, continue to struggle with corruption, inadequate infrastructure funding, and commercialization policies that prioritize profit over universal access.

On the contrary, there is increasing focus on public-private partnerships (PPPs) and multi-stakeholder engagements (Ragnedda et al., [2025](#)). This is particularly true in the context of tech companies. Gaps in the access and usage of new technologies are often linked to philanthropic, commercially driven, and even subsidized growth (Oughton et al., [2021](#)). However, there is no shortage of critiques on the sustainability and fairness of models driven by corporate interests (Jiang & Han, [2024](#)). It has been observed that the free or almost free internet access programs initiate some schemes that are of a content-restricting nature that put net neutrality and the essence of digital freedom into question (Ruiu & Ragnedda, [2024](#)), e.g., Internet.org.’ In the final analysis, it is essential to ensure that bridging the digital divide does not compromise digital rights or freedom, and that digital divide policies do not infringe upon the digital rights and autonomy of internet users (Zhao et al., [2021](#)).

### **Synthesis of the Literature**

A more common title for 'digital divide' is 'information gap.' It is a more complex discontinuity than a simple gap, encompassing issues of access, hardware, and affordability (Nipo et al., [2024](#)). It is patchworked into and rooted in underlying social and economic structures. In other words, addressing the divide extends beyond technology and encompasses integrated social issues that transcend education, community, and the workplace (Hawthorne & Grzybowski, [2024](#)). Otherwise, someone may gain short-lived improvements in connectivity metrics without creating valuable shifts in socio-economic

conditions (Hargittai, [2001](#); Ragnedda et al., [2025](#)). As such, the digital divide can only be closed if investments in ICT are strategically aligned with actions that address poverty, gender disparity, language barriers, and workforce development. From this perspective of social disparity, the digital divide indicator displays social inequity. At the same time, it serves as an area where planned, coordinated actions can achieve remarkable social value.

## **Methodological Approach**

### **Research Design**

This article employs a mixed-methods approach in its broader conceptualization. However, it primarily relies on desk-based research and secondary data analysis, given the extensive existing literature on the digital divide. The primary objective is to synthesize findings from multiple regions and contexts, presenting a comprehensive view of how the digital divide intersects with socioeconomic inequality. The research is therefore qualitative and analytical, drawing on academic publications, policy reports, and publicly available datasets to elucidate trends and interpret policy outcomes.

### **Data Sources and Collection**

- 1 Academic Databases: Peer-reviewed journals in sociology, communication studies, economics, and development studies were consulted to gather theoretical frameworks and empirical evidence on the digital divide. Databases such as JSTOR, Scopus, and Web of Science provided foundational literature.
- 2 Policy Documents and Reports: Sources from organisations like the World Bank, International Telecommunication Union (ITU), UNESCO, and various national governments were analysed to assess the scope of digital inclusion policies and programs. These documents often provide comprehensive data on internet penetration rates, broadband speeds, and funding allocations.
- 3 Statistical Data: Internationally recognized datasets, such as the ITU's annual reports on global ICT developments and the World Bank's World Development Indicators (WDI), were reviewed. These sources offer quantitative measures of internet usage, mobile phone subscriptions, and broadband coverage, disaggregated by country and region.

### **Data Analysis**

The study used thematic analysis to synthesize diverse findings into coherent themes. Key themes—including affordability, infrastructure gaps, skill-based divides, and policy interventions—were identified and cross-referenced with evidence from multiple sources. Given that the article aims to highlight overarching patterns and policy implications rather than measure specific statistical relationships, a narrative synthesis was deemed the most appropriate approach.

### **Case Selection**

Where relevant, illustrative case studies from both developed and developing countries are included. These cases were chosen based on their visibility in the literature, the availability of comprehensive data, and their representation of distinct policy environments. For example, South Korea's near-universal broadband penetration stands in stark contrast to rural regions of Sub-Saharan Africa, where less than 30% of the population has reliable internet access (Wang et al., [2025](#)).

### **Limitations**

- **Secondary Reliance:** The study depends primarily on secondary data and published research, which may carry its own biases. Official government reports can gloss over certain shortcomings, while NGO or activist publications might highlight particular perspectives.
- **Contextual Nuances:** Despite using varied sources, it remains challenging to account for all regional and local nuances, especially in large developing countries with significant internal diversity.
- **Dynamic Nature of Technology:** Rapid technological changes can render data on internet penetration and device ownership outdated quickly. The study therefore relies on the most recent (though not always up-to-date) statistics.

Despite these limitations, the methodological approach enables a comprehensive analysis of the digital divide's key dimensions, providing insights that can inform policymakers and academics alike. The following sections delve into the core findings, examining how these divides manifest in various social spheres and how policy responses have sought to address them.

## Key Findings: The Digital Divide in Practice

### Impact on Education

One of the most visible arenas where the consequences of the digital divide are evident is the education sector. During the COVID-19 pandemic, the abrupt shift to remote learning illuminated profound disparities in students' abilities to access online classes. In high-income neighbourhoods—whether in New York City or Seoul—students often had personal laptops and reliable broadband, enabling them to transition seamlessly to virtual learning environments. In contrast, those in lower-income areas, rural districts, or developing nations struggled with connectivity and device shortages, resulting in what some have termed “lost years” in education (Liotta, [2023](#)).

Even beyond emergencies, consistent access to online resources is fundamental for modern learning. Research shows that students who regularly use computers and the internet for research, collaboration, and skill development tend to perform better academically than those who do not (Bulman & Fairlie, [2016](#)). Digital literacy programs have become increasingly crucial for preparing children and youth for a workforce that is becoming increasingly reliant on technology. Where such opportunities are lacking, students are at risk of falling behind academically and professionally, thereby perpetuating intergenerational cycles of inequality.

### Labor Market Consequences

The digital divide also significantly influences labor market dynamics. Jobs ranging from administrative roles to skilled technical positions often require digital competencies. Even in non-technical occupations, digital tools are utilized for tasks such as payroll, customer relationship management, and data entry, among others. Applicants lacking basic ICT skills may be weeded out early in the recruitment process, creating a skill-based exclusion (Autor, [2019](#)). This issue is especially acute in regions experiencing rapid digital transformation, where the pace of technological change outstrips the capacity of educational systems to train new entrants to the labor force.

Furthermore, the rise of remote work offers new flexibility but also new forms of exclusion. Workers with limited internet bandwidth, older computers, or inadequate home office environments may find remote roles unattainable. They are effectively confined to local job markets, which may offer fewer opportunities and lower wages. Research has shown that remote work also tends to favor individuals who can navigate online marketplaces for

freelance or gig-economy opportunities, often requiring self-marketing and digital branding skills (Aithal, [2024](#)). Those on the lower end of the digital divide thus remain constrained in their economic mobility.

### **Healthcare Access and Telemedicine**

Individuals can access telehealth services from the comfort of their homes, eliminating the need for long-distance travel and reducing associated expenses (George & George, [2023](#)). This aspect of telemedicine can enhance the quality of life for specific individuals, particularly those battling severe illnesses. Apart from these benefits, another aspect of the scenario is that stable video interaction may require higher bandwidth. Patients are unable to fully benefit from telehealth when internet speeds are slow or data is excessively expensive. Moreover, seniors or those lacking the technical skills necessary to use mobile or web-based healthcare platforms face greater challenges than their more digitally engaged peers in accessing healthcare services, thus exacerbating health inequities (Yao et al., [2022](#)).

### **Civic Engagement and Political Participation**

The civic engagement aspect of the digital divide is particularly relevant to the question of whose voice is heard in the political conversations. Many governments and NGOs now use digital means for public consultation, service delivery, and communication engagement. Digital tools have already streamlined voter registration for many. Public hearings are often live-streamed or posted on social media, thereby increasing their accessibility. However, these technologies may work to the disadvantage of regions with lower digital infrastructure – decisions may be made in the absence of critical feedback or context.

Moreover, online platforms and social media form new virtual spaces for political activism and mobilization. The organizers of the Arab Spring and the Black Lives Matter movements both used the Internet to rally support for their causes. People without adequate confidence or skills to operate these systems, or access to the Internet, face unique difficulties in engaging with or impacting political discourse (Tufekci, [2017](#)). Consequently, a divided public sphere is created, where political control is exercised through digital systems whose access and penetration remain inequitable.

### **Bridging Initiatives and Case Studies**

Although the challenges are formidable, several success stories demonstrate that targeted initiatives can mitigate the digital divide. For instance, in Rwanda, the government's "Vision 2020" plan identified ICT development as a national priority. Through partnerships with private providers, Rwanda expanded 4G LTE coverage to a majority of the population, dramatically increasing internet penetration rates. Concurrently, efforts to provide laptops to students through programs modeled after "One Laptop per Child" attempted to address device access and literacy issues (Pavez & Farias, [2025](#)). While challenges remain—particularly in terms of cost and content relevance—Rwanda's progress illustrates how political will and structured policies can help reduce digital disparities in a low-income context.

In Finland, broadband access was declared a legal right over a decade ago, spurring nationwide investments in network infrastructure. This approach not only improved the affordability of broadband services but also positioned Finland as a leading digital innovator in Europe. Their policy framework emphasizes the government's role in mandating universal service obligations, ensuring that telecom providers extend coverage to even the most sparsely populated areas.

Meanwhile, libraries and community centers have emerged as crucial access points in both high-income and developing countries. In the United States, public libraries often serve as digital hubs for job seekers, students, and the elderly. Access to free Wi-Fi, computers, and digital literacy training can partially close the gap, particularly for those who cannot afford personal devices or home internet subscriptions (Bertot et al., [2012](#)). However, these initiatives must be complemented by broader policy measures that target cost barriers and educational curricula, ensuring that digital literacy gains are sustained beyond ad-hoc access points.

### **The Emergence of New Divides: AI and Advanced Technologies**

As technology evolves, the digital divide also becomes more nuanced. The rise of AI, big data, and advanced analytics may create new forms of exclusion. Having broadband access or basic internet skills may no longer suffice in a future where data-driven decision-making and automation shape employment and social interactions. Businesses and governments are increasingly deploying AI systems to filter job applicants, provide public services, or detect fraud. Those who lack the knowledge to understand or work with these systems—or the means to access digital platforms where data-driven interactions occur—face yet another layer of disadvantage (Eubanks, [2018](#)). In essence, as technology becomes more sophisticated, so do the divides that separate digital “haves” from “have-nots.”

Moreover, as data becomes a strategic resource, issues of data sovereignty and digital privacy gain prominence. Communities that are underrepresented online may find their contexts and needs overlooked in AI models, thereby perpetuating existing biases. At the same time, those who cannot navigate data privacy settings or who rely on free services that harvest personal data might be vulnerable to exploitation. Policy responses must thus anticipate the rapid evolution of digital ecosystems and incorporate principles of digital ethics, fairness, and inclusivity.

## **Policy Approaches and Multi-Stakeholder Collaboration**

### **Government-Led Initiatives**

Digitally inclusive policies have, to a large extent, been formulated and implemented by governments. They have supported investments in broadband through targeted policies and financing, eliminating access and cost barriers. Many countries have implemented ‘national universal service’ policies and established special funds, financed through levies paid by telecom providers, to subsidize network deployment in rural and economically weaker sections. Under certain conditions, such funds can be beneficial, especially if transparency and accountability requirements are met. A good example is India's USOF, which subsidizes the construction and maintenance of telecommunications infrastructures in remote areas and supports rural teledensity improvement.

Subsidies and tax incentives can also be introduced to promote the usage of computers and broadband among households. These methods have been applied with some levels of success. The critical question is how to target inefficiently allocated subsidies to those who need them most while avoiding middle- and upper-income groups. Another lever of policy is direct public investment in access points, such as community technology centers or public digital libraries. This model enables the most effective coverage in situations where households cannot afford individual devices or monthly broadband subscriptions.

### **Private Sector Involvement**

Telecom firms and technology companies have been at the forefront in building new network infrastructure while pursuing specific commercial goals in new markets. The commercial

viability of hitherto unserved markets can give rise to public-private partnership frameworks, in which government policy guarantees or subsidies encourage private investment in low-profitability areas. There is, however, a school of thought that argues PPPs can sometimes be infrastructure-driven, lacking concern for affordability and digital skills.

Concurrently, companies in the technology sector, including Google, Meta (Facebook), and Microsoft, have undertaken philanthropic and semi-commercial initiatives to expand internet connectivity. Google Station, which provides free public WiFi, and Facebook's Free Basics are initiatives aimed at increasing internet accessibility. Regardless of their intentions, such programs have been criticized for gatekeeping access or for prioritizing branding over the actual development of community projects. The blending of genuine public interests with corporate agenda, interests, or benefits poses a challenge. Users are not merely inactive doorkeepers; they are potential users, content creators, and citizens with entrepreneurial potential.

### **Civil Society and Grassroots Movements**

At the ground level, the most effort is directed by non-profit entities, community groups, and civil advocates. These organisations typically provide refurbished devices to low-income families, organise digital literacy education, and advocate for policy change at the intersection of social justice. From rural Spain to the hinterlands of South Asia, community networks owned and managed by residents, as well as non-governmental organizations, have emerged, demonstrating novel forms of cooperative control and ownership of ICT infrastructure. Such initiatives, in the culture of self-help, also generate local ownership and, in most cases, are more beneficial to constituents, filtering out the obstacles that a policy or good governance approach is likely to overlook in more complex sociolinguistic settings.

### **International Organizations and Multi-Lateral Frameworks**

The World Bank, ITU, and UNDP provide knowledge sharing, technical assistance, and funding for projects focused on digital inclusion. These institutions, among others, describe the importance of ICTs for advancement through the ITU's "Connect 2030 Agenda" and the UN SDGs, particularly Goal 9 on Industry, Innovation and Infrastructure. Global Partnerships can help align standards, reduce the cost of cross-border technologies, and develop frameworks for sharing best practices.

### **Challenges in Policy Coordination**

Despite multiple initiatives undertaken, we still encounter significant gaps due to fragmented policy barriers. These gaps result from a top-down approach applied across the various systems, particularly in telecommunications, education, labour, and social welfare, which operate as silos, lacking the necessary integration to close the digital divide. On the other hand, the private sector advocates for the rapid growth of financially lucrative operations, while the government aspires to widespread connectivity, regardless of profit margins. In the case of civil initiatives, they often lack sustained funding and the radical policy support needed to bolster grassroots programs.

Additionally, sustainability is equally important. Initiating ICT projects or pilot schemes is quite simple. However, maintaining their operations and future expansion is a complex process. Projects that are mostly externally funded or completely reliant on external expertise tend to disappear once the initial funding period ends, if local capacity is not built. As a result, involving the community and creating local leaders is essential to the effective implementation of digital inclusion.

## Recommendations

### Holistic Policy Frameworks

The article also highlights the correlation between the digital divide and socioeconomic disparity. Tackling the problem requires comprehensive policy plans that integrate the expansion of ICT with social welfare objectives. Governments should consider broadband infrastructure as part of education system reform, healthcare provision, and local economic growth, rather than viewing it as a standalone issue. Interventions can generate higher returns when implemented synergistically across multiple domains. The provision of broadband to schools can be done in a manner that also enhances community access, if, together with school services, community centers are open after hours.

### Targeted Subsidies and Affordability Measures

Governments and relevant authorities should ensure that cost barriers do not persist for households in low-income strata. Price discrimination strategies, subsidized access by the state, and blended financing arrangements are instrumental in alleviating the economic burden associated with owning devices and subscribing to broadband services. Concurrently, policymakers should intensify their focus on consumer protection to establish an equitable pricing policy framework. Regulators should make no-discrimination principles regarding data plan pricing enforceable, including those related to hidden fees/thumb throttling practices at lower service tiers.

### Strengthening Digital Literacy

To address the digital divide, it is essential to focus on digital literacy alongside capacity building. This phenomenon requires integrating ICT training into elementary and public education systems, where the practical application of ICT and reflection on online content are taught. Reskilling and upskilling programs designed for economically inactive adults in the contemporary era of technological advancement have been neglected and forgotten. Such programs can be designed in collaboration among community colleges, the private sector, and non-governmental organisations to utilise their combined expertise in design and technology training.

### Inclusive Content and Language Support

Partnerships should be developed by public authorities concerned with improving community health and technology providers who can facilitate support by developing tools to bridge the knowledge and practice gaps. This encompasses supporting the translation of essential websites and digital services into minority languages, assisting in the development of community-centered content, and promoting the development of digital infrastructure aligned with community values. Utilizing the skills of local creators and language specialists can transform the Internet from a means of cultural uniformity to an instrument for the enhancement and preservation of culture.

### Embracing Emerging Technologies Responsibly

The intersections of artificial intelligence, big data, and automation warrant policy consideration for novel forms of digital exclusion. Access inequality can be partially addressed by ensuring that ethical principles are integrated into the frameworks used by both public and private organizations for the development of AIs that dominate such employment fields, which in turn, disproportionately affect disadvantaged social segments. Evolving training programs for future professionals must enhance data literacy and AI ethics, enabling people to engage with and influence these rapidly growing processes.

## Conclusion

This paper has demonstrated the complexity and interconnection of the digital divide with socio-economic inequality. The digital divide, more than a stagnant gap in connectivity, is a never-ending work in progress shaped by technology, the economy, and society. The gap does not pertain only to first-level issues, such as access to the internet. The divide has second- and third-level issues that pertain to skills and skill outcomes. Closing the divide is not simply a matter of devices and network expansions.

Indeed, the divisions reflected through the utilization and access to technology reveal systematic differences in the structure of society. Income, location, and education are the pillars that enable those who manage to reap the benefits of technology to transcend the line of privilege. On the other hand, disaffiliated communities and groups face the stark absence of several opportunities, including remote work, e-learning, telemedicine, and other active political domains, thereby widening the gap of dependence and recourse.

The posted issues may be troublesome, but they are certainly not insurmountable. This article describes policies addressing international infrastructure issues, costs, digital competence, and community development, facilitated through engaged content. No single party — whether government, business, or civil society — can take ownership of this problem on its own. Shared goals and accountability frameworks are the basis of cross-party collaboration. These collaborations focus on the needed goals. Governments need to create integrated techno-social policies, and the private sector provides innovation to growth or underserved areas. CSOs, on the other hand, have proven to be the most crucial on the ground in helping communities ensure that bottom-up policies are developed and local voices are included in shaping and implementing them.

Ultimately, closing the digital divide is a moral, social, and economic necessity. Denying equitable access to ICTs is no different from restricting access to basic infrastructural amenities, such as electricity or clean water, in a time when digital platforms more than ever shape everyday life. From a development perspective, recognizing digital access as a fundamental human right enables societies to move toward a future in which technology promotes inclusion, ingenuity, and collective wealth, rather than exacerbating power and advantage imbalances.

## References

- Adam, I. O., & Alhassan, M. D. (2021). Bridging the global digital divide through digital inclusion: The role of ICT access and ICT use. *Transforming Government: People, Process and Policy*, 15(4), 580–596. <https://doi.org/10.1108/TG-06-2020-0114>
- Aissaoui, N. (2022). The digital divide: a literature review and some directions for future research in light of COVID-19. *Global Knowledge, Memory and Communication*, 71(8/9), 686–708. <https://doi.org/10.1108/GKMC-06-2020-0075>
- Aithal, P. (2024). Global Internet-based Growing (GIG) Economy—Challenges and Opportunities for Tech Generations Z and Alpha. *Emerging Trends in Management Science*, 1, 12–28. <https://doi.org/10.5281/ZENODO.13910693>
- Autor, D. H. (2019). Work of the past, work of the future. *AEA Papers and Proceedings*, 109, 1–32. <https://doi.org/10.1257/pandp.20191110>
- Ben, Y. A., Dahmani, M., & Ragni, L. (2022). ICT use, digital skills and students' academic performance: Exploring the digital divide. *Information*, 13(3), Article e129. <https://doi.org/10.3390/info13030129>

- Bertot, J. C., Jaeger, P. T., & Hansen, D. (2012). The impact of polices on government social media usage: Issues, challenges, and recommendations. *Government Information Quarterly*, 29(1), 30–40. <https://doi.org/10.1016/j.giq.2011.04.004>
- Bulman, G., & Fairlie, R. W. (2016). Technology and education: Computers, software, and the internet. In E. Hanushek, S. Machin, & L. Woessmann (Eds.), *Handbook of the Economics of Education* (Vol. 5, pp. 239–280). Elsevier.
- Chen, R. (2021). *A demand-side view of mobile internet adoption in the Global South*. World Bank.
- Ciarli, T., Kenney, M., Massini, S., & Piscitello, L. (2021). Digital technologies, innovation, and skills: Emerging trajectories and challenges. *Research Policy*, 50(7), Article e104289. <https://doi.org/10.1016/j.respol.2021.104289>
- Danaher, J. (2022). Techno-optimism: An analysis, an evaluation and a modest defence. *Philosophy & Technology*, 35(2), Article e54. <https://doi.org/10.1007/s13347-022-00550-2>
- Dev, M., Kumar, M., & Saha, D. (2025). How Do Information and Communication Technologies (ICTs) Affect National Well-Being? The Contrasting Influence of Mobile Phones and Household Computers. *Social Indicators Research*, 179(3), 1431–1461. <https://doi.org/10.1007/s11205-025-03671-1>
- DiMaggio, P., & Hargittai, E. (2001). *From the 'digital divide' to 'digital inequality': Studying Internet use as penetration increases*. Princeton Center for Arts and Cultural Policy Studies.
- Donner, J. (2008). Research approaches to mobile use in the developing world: A review of the literature. *The Information Society*, 24(3), 140–159. <https://doi.org/10.1080/01972240802019970>
- Eubanks, V. (2018). *Automating inequality: How high-tech tools profile, police, and punish the poor*. St. Martin's Press.
- Fahlevi, M., Asdullah, M. A., Raza, F. A., Watto, W. A., Aljuaid, M., & Aziz, A. L. (2024). The influence of information and communication technology on trade in developing countries and partners. *Cogent Business & Management*, 11(1), Article e2320814. <https://doi.org/10.1080/23311975.2024.2320814>
- Farooqi, A., Khalid, U., & Khan, A. M. (2022). Understanding the digital divide in the contemporary digital world. *Global Political Review*, 7(4), 7–14.
- Gallardo, R., & Whitacre, B. (2024). An unexpected digital divide? A look at internet speeds and socioeconomic groups. *Telecommunications Policy*, 48(6), Article e102777. <https://doi.org/10.1108/JSTPM-05-2024-0176>
- George, A. S., & George, A. H. (2023). Telemedicine: a new way to provide healthcare. *Partners Universal International Innovation Journal*, 1(3), 98–129. <https://doi.org/10.5281/zenodo.8075850>
- Hargittai, E. (2001). *Second-level digital divide: Mapping differences in people's online skills*. ARXIV Preprints. <https://doi.org/10.48550/arXiv.cs/0109068>
- Hawthorne, R., & Grzybowski, L. (2024). Narrowing the “Digital Divide”: The Role of Fixed and Mobile Infrastructure. *Journal of Economics & Management Strategy*. Advance online publication. <https://doi.org/10.1111/jems.12622>
- Hidayat-Ur-Rehman, I. (2024). Digital competence and students' engagement: a comprehensive analysis of smartphone utilization, perceived autonomy and formal digital learning as mediators. *Interactive technology and smart education*, 21(3), 461–488. <https://doi.org/10.1108/ITSE-09-2023-0189>
- Irizarry, T., DeFries, T., & Curran, C. R. (2017). Patient portals and patient engagement: A state of the science review. *Journal of Medical Internet Research*, 19(11), Article e99. <https://doi.org/10.2196/jmir.4255>

- James, J. (2021). Confronting the scarcity of digital skills among the poor in developing countries. *Development Policy Review*, 39(2), 324–339. <https://doi.org/10.1111/dpr.12479>
- Jamil, S. (2021). From digital divide to digital inclusion: Challenges for wide-ranging digitalization in Pakistan. *Telecommunications Policy*, 45(8), Article e102206. <https://doi.org/10.1016/j.telpol.2021.102206>
- Jiang, W., & Han, B. (2024). *Cellular Communication Networks and Standards: The Evolution from 1G to 6G*. Springer.
- Kinoti, P. N. (2024). *The Role of NGOs in Bridging the Digital Literacy Access Gap in Public Primary Schools in Buuri and Isiolo Sub-County* [Doctoral dissertation, KeMU]. KeMU. <http://41.89.31.5/handle/123456789/1817>
- Kumar, R. (2023). English language and digital literacy: Navigating the information age. *Journal of International English Research Studies*, 1(2), 25–31.
- Le, D. (2024). Investigating how cultural differences influence the translation process and the strategies used by translators to bridge cultural gaps. *Journal of Translation and Language Studies*, 5(3), 26–36. <https://doi.org/10.48185/jtls.v5i3.1268>
- Le, H.-C., & Le, T.-H. (2023). Effects of economic, social, and political globalization on environmental quality: International evidence. *Environment, Development and Sustainability*, 25(5), 4269–4299. <https://doi.org/10.1007/s10668-022-02243-4>
- Liotta, L. A. (2023). Digitalization and social inclusion: bridging the digital divide in underprivileged communities. *Global International Journal of Innovative Research*, 1(1), 7–14.
- Makananise, F. O. (2024). Decolonial Thinking of Digital Media Inequalities and Indigenous Language Marginalisation of the Global South from the South African Context. In F. O. Makananise, & S. E. Madima (Eds.), *Decolonising Digital Media and Indigenisation of Participatory Epistemologies* (pp. 17–39). Routledge.
- Mathrani, A., Sarvesh, T., & Umer, R. (2022). Digital divide framework: Online learning in developing countries during the COVID-19 lockdown. *Globalisation, Societies and Education*, 20(5), 625–640. <https://doi.org/10.1080/14767724.2021.1981253>
- McCarty, T. L., Noguera, J., Lee, T. S., & Nicholas, S. E. (2021). “A viable path for education”—Indigenous-language immersion and sustainable self-determination. *Journal of Language, Identity & Education*, 20(5), 340–354. <https://doi.org/10.1080/15348458.2021.1957681>
- Merkaj, E., Imami, D., & Drope, J. (2025). The dual impact of tobacco spending: crowding out essentials and crowding in addictive behaviors. *Scientific reports*, 15(1), Article e24648. <https://doi.org/10.1038/s41598-025-08648-1>
- Muñoz, J. A. H., & Valencia, D. C. (2025). Trends and challenges of digital divide and digital inclusion: A bibliometric analysis. *Journal of Information Science*, 51(4), 813–830. <https://doi.org/10.1177/01655515221148366>
- Nadorff, D. K., Anreddy, S., Sergi, K., Ahonle, Z. J., Stouffer, C., Hemphill, T., & Buys, D. R. (2025). Down the Digital Delta: Health Information Inequities Among Rural Mississippi Caregivers. *Healthcare*, 13(18), Article e2361. <https://doi.org/10.3390/healthcare13182361>
- Naveed, K., Jamal, A., & Ahmad, I. (2025). Framing gender in Pakistan’s digital policies: a critical examination through capabilities and decolonial feminist lenses. *Journal of Science and Technology Policy Management*. <https://doi.org/10.1108/JSTPM-05-2024-0176>
- Nipo, D. T., Lily, J., Fabeil, N. F., & Jamil, I. A. A. (2024). Transforming rural entrepreneurship through digital innovation: A review on opportunities, barriers and challenges. *J. Mgmt. & Sustainability*, 14, 114–127.

- Oriishi, A. (2025). What has the US Government gained by formalizing Team Telecom?: Team Telecom and the FCC's dual security approach. *Journal of Cybersecurity*, 11(1), Article etyaf012. <https://doi.org/10.1093/cybsec/tyaf012>
- Oughton, E. J., Lehr, W., Katsaros, K., Selinis, I., Bublely, D., & Kusuma, J. (2021). Revisiting wireless internet connectivity: 5G vs Wi-Fi 6. *Telecommunications Policy*, 45(5), Article e102127. <https://doi.org/10.1016/j.telpol.2021.102127>
- Pavez, I., & Fariás, C. (2025). One Laptop per Child: a case study of digital inclusion in rural Chile. *Technology, Pedagogy and Education*. Advance online publication. <https://doi.org/10.1080/1475939X.2025.2541958>
- Pelicioni, P. H. S., Michell, A., Santos, P. C. R. D., & Schulz, J. S. (2023). Facilitating Access to Current, evidence-based Health Information for Non-english speakers. *Healthcare*, 11(13), Article e1932. <https://doi.org/10.3390/healthcare11131932>
- Ragnedda, M., Ruiu, M. L., & Gladkova, A. (2025). Reframing digital capital in unequal contexts. *World of Media. Journal of Russian Media and Journalism Studies*, 3, 5–29.
- Reljic, J., Evangelista, R., & Pianta, M. (2021). Digital technologies, employment, and skills. *Industrial and Corporate Change*, 34(3), 385–406. <https://doi.org/10.1093/icc/dtab059>
- Ruiu, M. L., & Ragnedda, M. (2024). From Poverty to Digital Poverty. In M. L. Ruiu & M. Ragnedda (Eds.), *Digital-Environmental Poverty: Digital and environmental inequalities in the post-covid era* (pp. 15–39). Palgrave Macmillan
- Rydzewski, P. (2025). Digital inequality and sustainable development. *Problemy Ekorozwoju*, 20(1), 96–108. <https://doi.org/10.35784/preko.6691>
- Shao, X., Yang, Y., & Wang, L. (2021). Digital divide or digital welfare?: the role of the Internet in shaping the sustainable employability of Chinese adults. *Journal of Global Information Management (JGIM)*, 29(5), 20–36.
- Smith, S. G., & Sinkford, J. C. (2022). Gender equality in the 21st century: Overcoming barriers to women's leadership in global health. *Journal of Dental Education*, 86(9), 1144–1173. <https://doi.org/10.1002/jdd.13059>
- Taylor, J., & Kochem, T. (2022). Access and empowerment in digital language learning, maintenance, and revival: A critical literature review. *Diaspora, Indigenous, and Minority Education*, 16(4), 234–245. <https://doi.org/10.1080/15595692.2020.1765769>
- Tufekci, Z. (2017). *Twitter and tear gas: The power and fragility of networked protest*. Yale University Press.
- van Deursen, A. J., & van Dijk, J. A. (2014). The digital divide shifts to differences in usage. *New Media & Society*, 16(3), 507–526. <https://doi.org/10.1177/1461444813487959>
- Wang, D., Shinde, S., Drysdale, R., Vandormael, A., Tadesse, A. W., Sherfi, H., & Fawzi, W. W. (2025). Access to digital media and devices among adolescents in sub-Saharan Africa: A multicountry, school-based survey. *Maternal & Child Nutrition*, 21, Article e13462. <https://doi.org/10.1111/mcn.13462>
- Yao, R., Zhang, W., Evans, R., Cao, G., Rui, T., & Shen, L. (2022). Inequities in health care services caused by the adoption of digital health technologies: scoping review. *Journal of medical Internet research*, 24(3), Article e34144.
- Zhao, L., Cao, C., Li, Y., & Li, Y. (2021). Determinants of the digital outcome divide in E-learning between rural and urban students: Empirical evidence from the COVID-19 pandemic based on capital theory. *Computers in Human Behavior*, 130, Article e107177. <https://doi.org/10.1016/j.chb.2021.107177>