



## The Digital Divide and Inclusive Media Access: Structural Inequalities in the Global Information Ecosystem and Pathways to Digital Equity

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### Abstract

This paper examines the digital divide as a structural inequality in the global information ecosystem, analyzing its multiple dimensions, consequences for democratic participation and media access, and pathways to digital equity. Drawing on van Dijk's (2020) sequential access theory, Hargittai's (2002, 2024) research on second-level and subsequent digital divides, and empirical data from the ITU, UNESCO, and the World Bank, the study demonstrates that 2.6 billion people remain offline globally while billions more lack the skills for meaningful digital participation. The analysis extends beyond traditional access concerns to encompass emerging algorithmic and AI divides that compound existing inequalities. The paper proposes a comprehensive digital equity framework addressing infrastructure, affordability, skills development, cultural responsiveness, and international policy coordination.

**Keywords:** digital divide, inclusive access, digital equity, information inequality, Global South, internet penetration, digital infrastructure, media access, algorithmic divide, AI divide, digital literacy, democratic participation.

### Introduction

The digital divide, the persistent gap between those who have meaningful access to digital technologies and those who do not, remains one of the most significant structural inequalities shaping the global information ecosystem in the third decade of the twenty-first century. Despite extraordinary expansion of internet connectivity over the past two decades and optimistic narratives of digital democratization, the International Telecommunication Union's Facts and Figures 2024 report documents that approximately 2.6 billion people remain entirely offline, with internet penetration ranging from 89 percent in Europe to merely 37 percent in Africa. Mobile internet costs in Africa are 12 to 14 times higher than in Europe relative to income, and the global urban-rural connectivity gap, with 83 percent urban internet penetration compared to 48 percent rural, creates compounding informational inequalities that intersect with and reinforce existing economic, educational, and political marginalization. UNESCO estimates that young girls are 35 percent less likely than male peers to have digital skills, adding a gender dimension to digital exclusion that compounds other forms of inequality.

The implications of the digital divide for democratic governance, economic participation, and social inclusion have become increasingly consequential as essential services, public information systems, civic participation mechanisms, and economic opportunities migrate to digital platforms. Citizens without reliable internet access cannot participate in the increasingly digital public sphere, access digital government services, benefit from online health information, engage with data-driven journalism, participate in online democratic deliberation, or access the educational and economic opportunities that digital connectivity enables. The COVID-19 pandemic dramatically exposed and intensified these inequalities as education, employment, healthcare, and social services shifted online, creating what researchers termed a pandemic digital divide in which those without connectivity suffered compounding disadvantages in health, education, and economic security.

This paper examines the digital divide as a structural inequality in the global information ecosystem, analyzing its multiple dimensions, its consequences for democratic participation and media access, and the pathways through which digital equity can be pursued. The analysis draws on van Dijk's (2020) comprehensive digital divide theory, Hargittai's (2002, 2024) research on second-level and subsequent digital divides, and recent empirical evidence from the ITU, UNESCO, and the World Bank to develop a multi-dimensional analysis that extends beyond access to encompass skills, usage, and outcomes dimensions of digital inequality.

## **Theoretical Framework: Multiple Dimensions of Digital Inequality**

### ***Van Dijk's Sequential Access Model***

Van Dijk's (2020) digital divide theory, the most comprehensive theoretical treatment of digital inequality available, identifies four sequential types of access that create compounding barriers to meaningful digital participation. Motivational access concerns whether individuals perceive digital technologies as relevant, useful, and accessible to them, addressing the psychological and cultural barriers that may prevent adoption even when physical access is available. Material access concerns the availability, affordability, and quality of hardware, software, and connectivity required for digital participation, encompassing the traditional first-level digital divide of physical access. Skills access concerns the technical, informational, and strategic competencies required to use digital technologies effectively, encompassing Hargittai's second-level digital divide. Usage access concerns whether individuals use digital technologies in ways that produce meaningful benefits for their lives, encompassing the third-level digital divide of differential outcomes from digital engagement.

Van Dijk's model emphasizes that these four types of access are sequential and compounding: without motivational access, material access is irrelevant; without material access, skills cannot be developed; without skills, even accessed technologies cannot be used effectively; and without effective usage, the potential benefits of digital connectivity remain unrealized. This sequential model has important policy implications: it demonstrates that infrastructure investment alone, providing connectivity and devices, is necessary but insufficient for achieving digital equity, and that comprehensive digital inclusion strategies must address motivational, skills, and usage dimensions alongside material access.

### ***Hargittai's Second-Level Digital Divide and Beyond***

Hargittai's (2002) foundational concept of the second-level digital divide shifted scholarly attention from the binary question of whether people have internet access to the more nuanced question of what people are able to do with the access they have. Her research demonstrated that individuals with comparable levels of internet access differ dramatically in their digital skills, their ability to find and evaluate information online, their capacity to protect their privacy and security, and their effectiveness in using digital tools for education, employment, and civic participation. These skill differences correlate systematically with

education, income, age, race, and other social stratification variables, meaning that the distribution of digital skills reproduces rather than equalizes existing social inequalities.

Hargittai's (2024) *Connected in Isolation: Digital Privilege in Unsettled Times* updates this research for the post-pandemic digital environment, documenting how the intensification of digital dependency during COVID-19 amplified the consequences of pre-existing digital skill inequalities. Individuals with high digital skills were better able to adapt to remote work, access online education, navigate digital health services, and maintain social connections during isolation, while those with limited digital skills experienced compounding disadvantages that reduced their economic resilience, educational continuity, and social well-being. The concept of digital privilege, developed in this work, captures the systematic advantages that accrue to those who can navigate digital environments effectively and the corresponding systematic disadvantages experienced by those who cannot.

## **The Media Dimensions of Digital Inequality**

### ***Information Deserts: Physical and Digital***

The concept of information deserts, areas lacking access to reliable, relevant, local information, connects the digital divide to the media trust and journalism sustainability challenges examined elsewhere in this paper series. The closure of approximately 2,900 newspapers in the United States since 2005 has created physical information deserts where local journalism no longer exists. The digital divide creates overlapping digital information deserts where communities lack the connectivity, devices, and skills required to access even the digital information sources that remain. The intersection of physical and digital information deserts creates conditions of severe informational deprivation in which citizens have access to neither traditional nor digital local news, accountability journalism, or public interest information about the institutions that govern their lives.

The communities most affected by these overlapping information deserts are disproportionately rural, low-income, elderly, and populations of color, communities that are also disproportionately affected by other forms of structural inequality including limited healthcare access, underfunded schools, diminished political representation, and reduced economic opportunity. The informational dimension of this compound disadvantage is particularly consequential because access to reliable information is a prerequisite for effective

engagement with the political, economic, and social systems through which other inequalities might be addressed. Without local journalism providing accountability coverage of municipal government, without reliable internet access enabling engagement with digital government services, and without the digital skills needed to evaluate online information critically, digitally marginalized communities are systematically excluded from the informational conditions that democratic participation and economic mobility require.

### *Algorithmic and AI Divides*

The emergence of algorithmic curation and artificial intelligence as mediators of information access creates new dimensions of digital inequality that compound the access and skills divides. Algorithmic divides arise when recommendation systems trained on data from well-connected, digitally active populations systematically underserve the informational needs of digitally marginalized communities. If an algorithm's training data disproportionately represents the interests, preferences, and behaviors of young, urban, educated, and affluent users, its recommendations will be optimized for those populations and potentially irrelevant or inappropriate for users with different characteristics, needs, and contexts. This algorithmic bias in information provision creates a feedback loop in which digitally marginalized communities receive less relevant content, engage less with the platform, generate less data, and are consequently less well-served by recommendation systems in a self-reinforcing cycle of digital exclusion.

AI divides represent an emerging dimension of digital inequality as artificial intelligence tools become increasingly integrated into education, employment, healthcare, and civic participation. Communities without access to AI tools, whether due to connectivity limitations, hardware constraints, financial barriers, or skills deficits, are excluded from the productivity gains, informational capabilities, and decision support that AI provides, while simultaneously being most vulnerable to AI-generated misinformation, algorithmic discrimination, and automated decision-making processes that affect their lives without their meaningful participation or understanding. Addressing AI divides requires not only expanding access to AI

tools but also developing the AI literacy competencies needed for critical and productive engagement with artificial intelligence systems.

## **Pathways to Digital Equity**

### ***Infrastructure and Affordability***

Closing the material access dimension of the digital divide requires sustained investment in connectivity infrastructure, device access, and affordability programs. Broadband infrastructure expansion, including fiber optic deployment to underserved areas, satellite internet services such as Starlink, and community networking initiatives, can address the physical connectivity gap, though the economics of rural and remote infrastructure deployment remain challenging without public subsidy or regulatory mandate. Universal service obligations, requiring telecommunications providers to extend service to economically unattractive areas as a condition of market access, represent a well-established policy tool that can be adapted to broadband and mobile internet contexts. Device access programs, providing subsidized or free devices to low-income households, schools, and community institutions, address the hardware dimension of material access.

Affordability interventions are equally essential: even where infrastructure exists, the cost of internet service and devices relative to income can constitute a prohibitive barrier, particularly in low-income countries and communities. Regulatory approaches including rate regulation, targeted subsidies, zero-rating of essential services, community broadband initiatives, and competitive market structures that drive prices down through provider competition can address the affordability dimension. The ITU's data documenting mobile internet costs in Africa at 12 to 14 times European levels relative to income underscores the scale of the affordability challenge in the regions where connectivity expansion would have the greatest impact on digital inclusion.

### ***Skills Development and Digital Literacy***

Addressing the skills dimension of digital inequality requires sustained investment in digital literacy education across formal educational systems, community-based training programs, and lifelong learning initiatives. Digital literacy curricula should encompass not only basic technical skills, operating devices, navigating interfaces, and using applications, but also the informational skills needed for effective search, evaluation, and use of digital information;

the safety and privacy skills needed for secure digital participation; and the critical literacy skills needed for evaluating the reliability and bias of digital content, including algorithmic and AI literacy competencies. The integration of digital literacy into formal education systems, as Finland has demonstrated with media literacy, is the most effective approach for achieving population-level skills development, but complementary community-based and informal learning programs are essential for reaching adult populations, out-of-school youth, and communities with limited access to formal educational institutions.

Culturally responsive digital literacy programs that are designed with and for the communities they serve, rather than imposed by external organizations with limited understanding of local contexts, needs, and capacities, are more likely to achieve meaningful adoption and sustained impact. The Code for Africa network's civic technology labs, India's digital literacy mission, and various community-based digital inclusion initiatives in Latin America demonstrate that effective digital literacy programming can be developed across diverse cultural and institutional contexts, but success depends on local adaptation, community ownership, and sustained resource commitment rather than one-time intervention delivery.

### ***Global Policy Frameworks and International Cooperation***

Achieving digital equity at the global level requires international policy coordination that addresses the structural factors driving digital inequality across and within nations. The United Nations Sustainable Development Goals include targets related to digital connectivity and literacy, but progress toward these targets has been uneven, with the least connected regions also facing the greatest challenges in other development dimensions. The ITU's Partner2Connect Digital Coalition, the World Bank's Digital Development initiative, and UNESCO's digital education programs represent international cooperation frameworks addressing digital inclusion, but their aggregate impact remains modest relative to the scale of the challenge.

Trade and investment frameworks that support digital infrastructure development in underserved regions, technology transfer arrangements that enable local capacity building rather than perpetual dependency on external providers, and regulatory cooperation that prevents regulatory arbitrage by technology corporations seeking to minimize their obligations to digitally marginalized communities are all essential components of a comprehensive international digital equity strategy. The principle that meaningful digital participation is a prerequisite for informed democratic citizenship in the contemporary world implies a right to digital access that should

inform international development policy, trade negotiation, and technology governance frameworks.

## Conclusion

The digital divide remains one of the most consequential structural inequalities shaping the global information ecosystem, with implications extending across democratic participation, economic opportunity, educational access, health outcomes, and social inclusion. The persistence and multi-dimensionality of digital inequality, encompassing motivational, material, skills, and usage access as well as emerging algorithmic and AI divides, demonstrates that technological advancement alone does not produce digital equity and that deliberate policy intervention across multiple dimensions is essential. The 2.6 billion people who remain offline, the billions more who lack the skills for effective digital participation, and the communities affected by overlapping physical and digital information deserts collectively represent a democratic deficit that cannot be addressed through incremental measures but requires sustained, coordinated, and adequately resourced global action to ensure that the informational conditions for democratic citizenship are available to all rather than restricted to the digitally privileged.

## References

- Hargittai, E. (2002). Second-level digital divide: Differences in people's online skills. *First Monday*, 7(4).
- Hargittai, E. (2024). *Connected in isolation: Digital privilege in unsettled times*. MIT Press.
- ITU. (2024). *Facts and figures 2024: ICT indicators*. International Telecommunication Union.
- Newman, N., et al. (2025). *Reuters Institute digital news report 2025*. Reuters Institute for the Study of Journalism.
- UNESCO. (2023). *Global education monitoring report 2023*. UNESCO.
- UNESCO. (2024). *MIL responses to generative AI*. UNESCO.
- Usher, N. (2021). *News for the rich, white, and blue*. Columbia University Press.
- van Dijk, J. A. G. M. (2020). *The digital divide*. Polity Press.
- World Bank. (2024). *Digital progress and trends report*. World Bank Group.