

**Digital Poverty and Social Marginalization:
A Sociological Reading of the Digital Divide and
the Prospects for Justice**
**الفقر الرقمي والتهميش الاجتماعي: قراءة سوسيولوجية في الفجوة
الرقمية وأفاق العدالة**

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Abstract:

This article identifies digital poverty as an important example of marginalization in the digital age, claiming that its roots extend past technical or infrastructural problems, reflecting deeper harm in social and economic inequality which becomes reproduced through digitalization. Using sociological and critical lens, and based on international literature on digital justice, this article has four axes: articulating digital poverty and its intellectual context; exploring the digital divide in terms of economic, social, and cultural measures; understanding how digitalization reproduces exclusion and inequality; and articulating digital justice as a strategy to address digital poverty.

Ultimately, it depicts digital poverty as a process which occurs beyond lack of access and digital skills, and invites policies to be inclusive and substantive based on empowerment, fairness and equal meaning, rather than simply access.

Keywords: Digital poverty; Digital divide; Digital justice; Marginalization; Digital inclusion.

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ملخص:

يتناول هذا المقال الفقر الرقمي كإحدى أبرز صور التهميش في العصر الرقمي، موضحاً أنه لم يعد محصوراً في الأبعاد التقنية أو مشكلات البنية التحتية، بل يعكس بُنى اجتماعية واقتصادية أعمق تُعيد إنتاج اللامساواة التقليدية. وقد اعتمدت الدراسة مقارنةً سيولوجية تحليلية نقدية تستند إلى الأدبيات الدولية في مجال العدالة الرقمية، وانطلقت من أربعة محاور مترابطة: أولها تأصيل مفهوم الفقر الرقمي ورصد جذوره الفكرية، وثانيها تحليل الفجوة الرقمية وتجلياتها على المستويات الاقتصادية والاجتماعية والثقافية، وثالثها الكشف عن الآليات التي تعيد عبرها الرقمنة إنتاج الإقصاء والتفاوت، ورابعها طرح العدالة الرقمية كخيار استراتيجي لمواجهة التهميش الرقمي والاجتماعي.

وتخلص الدراسة إلى أن الفقر الرقمي ليس مجرد نقص في النفاذ إلى التكنولوجيا أو ضعف في الكفاءات الرقمية، بل هو ظاهرة بنيوية تعكس اختلالات المجتمع، ما يفرض تبني سياسات إدماج رقمية شمولية قائمة على التمكين والإنصاف وتكافؤ الفرص بدلاً من الاكتفاء بمقاربة الوصول.

الكلمات المفتاحية: الفقر الرقمي، الفجوة الرقمية، العدالة الرقمية، التهميش، الإدماج الرقمي.

Introduction

In light of the rapid digital transformations the world has witnessed in recent decades, new concepts have emerged that accompany this shift and simultaneously reveal unprecedented forms of social differentiation—most notably, the concept of digital poverty. Poverty is no longer measured solely by the lack of economic resources or low-income levels; it is now also linked to the ability to access the digital space, interact with its tools and technologies, and benefit from its potential in areas such as education, health, employment, and social and political participation. Digital poverty addresses not just the lack of connectivity, or a lack of technical resources but other newly seen forms of structural discrimination where digital infrastructures intersect societal power relations and domination.

The COVID-19 pandemic, in particular, revealed the extent of the digital divide between individuals and communities; the mere ability to use the internet become an essential condition to undertake everyday life. But the "digital transformation" was not equitable; instead, it was

presented as the reconstruction of existing social inequalities but with a new digital form. This has been reiterated in multiple research projects, particularly in relation to contexts in the Global South (Galperin & Mariscal, 2007). Other researchers suggested that "digital poverty" is more a new form of structural marginalization than being derived strictly from an absence of technology, like discussed by Warschauer (2003) and Eubanks (2018) in different contexts.

Digital poverty is significant because it refers not just to the lack of technology; it also includes gaps in digital skills, the quality of use, and the impact of these gaps on social inclusion. Digital inequality is not just a technical or structural issue; it demonstrates the social, economic, and cultural way in which technology exists and, in ways, limits the ways that technology can be used (Steyn & Johanson, 2011).

Helsper (2016) illuminated these dimensions by utilising a theory of relative deprivation and she articulated that digital exclusion derives from an individual comparing themselves to others in their social environment (Helsper, 2017). Further, we can relate Bourdieu's theory of capital and begin to think about digital inequality as a remaking of existing marginality and positionality manifested in new digital spaces.

Numerous international studies have shown that marginalized groups—such as women, the elderly, low-income individuals, and rural populations—are the most vulnerable to digital exclusion. This was confirmed by the OECD (2022) study on inequalities in digital skills, as well as by Leigh (2010), who focused on educational disparities linked to digital access in countries of the Global South. Moreover, the work of Ferro and colleagues (2011) demonstrated that technological policies may reproduce poverty rather than overcome it when they are not formulated based on the principles of social justice (Ferro, Dwivedi, Gil-Garcia, & Williams, 2011).

Within the same context, Van Deursen and Helsper (2015) provide a concrete analytical framework to understand digital poverty made up of an accessible technology dimension, a skills dimension, and a usage dimension to realise meaningful benefits through the use of digital tools in different areas of life (Van Deursen & Helsper, 2015). These dimensions are closely associated with unequal social structures, and as such, digital poverty is a manifestation of the structural discrimination embodied in society. Some recent studies have introduced a notion of adverse digital incorporation, in which the experience of digital connectivity itself possessed a potential to deepen exploitation rather than enable empowerment, particularly within the realm of unjust digital policies (Heeks, 2018).

This article continues a broader academic feat to theorize digital poverty as a new variable pertaining to social marginalization. It seeks to account for the digital divide, break-down its variables, and reflect on its social implications, before moving on to a limitational discussion on the limits of digital justice to remedy the gap. The article will rely on new theoretical and critical approaches, comparative studies, field studies, and emergent intersections between digital sociology, public policy, and social justice literatures.

This study is guided by the following research question: **To what extent, if any, can we consider digital poverty as a new form of social marginalization that reflects the ongoing persistence of old structural inequalities in new digital forms? Also, what role could digital justice play in this regard and promote equitable digital inclusion?**

In order to address the research question, the article is structured into the following four sections. The first section outlines the conceptual basis and theoretical development of the concept, the second examines the digital divide and how it manifests, and the third assesses how digital poverty perpetuates social exclusion. The fourth section explore the potential for digital justice.

The importance of this article lies in the rapid development of digital policies in Global South countries, including Algeria, with little emphasis on the principle of digital social justice. This necessitates a fresh social decaling on digital equity and the need to provide a more intrinsic attention to digital poverty within the broader context of digital equity.

1. Digital Poverty – Concept, Dimensions, and Theoretical Shifts

As digitization expands and the internet becomes increasingly embedded in everyday life, the relationship between humans and technology has transcended a merely functional interaction. It has emerged as a central indicator of empowerment or exclusion, with digital connectivity now serving as a key benchmark for inclusion or marginalization, access or disenfranchisement.

In this context, the concept of the *digital divide* gained prominence in the 1990s as a framework for analyzing disparities in access to information and communication technologies (ICT). However, it soon proved insufficient in capturing the complexity of these disparities. Gradually, it gave way to the more nuanced concept of *digital poverty*, which frames digital inequality as a multidimensional and structural

phenomenon, deeply embedded in the social, economic, and cultural marginalization patterns of the digital age.

1.1. From the Digital Divide to Digital Poverty:

The digital divide was first discussed in the 1990s as a way to assess differences among individuals and communities in access to information and communication technologies, including access to basic infrastructure such as computer ownership or internet connection (Warschauer, 2003). The original framing of this term was useful in the early discourse around digital inequality, but it later received extensive, negative feedback and was criticized for limiting the phenomenon to a single dimension: access; and omitting a nuanced understanding of other important dimensions such as digital skills, usage, and, most importantly, the social contexts that shape how individuals relate to technology.

In this way, the theoretical discussion evolved to the notion of Digital Poverty, as it is a broader concept, encompassing not only the lack of access to technology, but also the lack of effective and equitable use, and the structural impediments that prevent digital resources from being converted into social, cultural or knowledge capital (Helsper, 2017). Digital poverty thus is understood as one of the manifestations of existing inequalities - in relation to education, income and other enabling infrastructures - meaning it is a 'new' indication of old forms of social exclusion, but in a digital context.

Warschauer (2003) contributed to reframing the issue of the digital divide by noting that digital technologies do not produce their impacts in a technical vacuum. Digital technologies are positioned in the nexus of those research findings, not only entwined with the culture of capital, but also entwined with educational infrastructure and public policy. There are normative issues that they pose, in noting that the absence of technical means, is not at the core of the problem and of digital exclusion, it is how those technical means are used and whether they can truly act as a means of empowerment. He posits that we need to think about these issues holistically, and that we need to privilege social justice and digital equity as the forefront of technology inclusion policies.

1.2. Digital Poverty as a Case of Multidimensional Marginalization:

Recent perspectives on digital poverty have incorporated a cumulative and multidimensional layer of deprivation, and the one that emphasizes that digital tools, in some circumstances, rather than

empowering, can be utilized to surveil marginalised social groups, largely women and the urban poor (Eubanks, 2018). As emphasized, "digitization without justice" not only perpetuates inequality but reproduces poverty in new forms through automated mechanisms that restrict access to social supports, basic services, or job opportunities.

It is important to note that in the Global South, digital poverty is not limited to lack of infrastructure. Rather, it relates to the capacity to transform technologies into tools for both economic innovation and social cohesion (Kagami, Tsuji, & Giovannetti, 2004). Societies that accept technology without addressing institutional and cultural disparities will always remain susceptible to a form of "partial inclusion" within the global digital system.

According to Galperin and Mariscal (2007), digital poverty is more than just a technological gap related to access to networks; it constitutes an extension of structural social discrimination. It is composed of three interrelated dimensions: (Galperin & Mariscal, 2007, pp. 7-10)

- **Access:** The actual ability to connect to digital networks and services.
- **Skills:** The capacity to use technology effectively, which requires training and capacity-building.
- **Outcomes:** The ability to transform technology into tangible social or economic benefits.

Table Nº 1: Dimensions of Digital Poverty According to Galperin & Mariscal (2007)

Dimension	Definition	Implications
Access	Physical access to digital networks and infrastructure.	Limited or no internet connectivity, lack of devices or broadband coverage.
Skills	Ability to use digital tools effectively, including functional digital literacy.	Inability to engage with digital services due to lack of training or education.
Outcomes	Capacity to convert digital access and skills into tangible benefits.	Unequal economic, social, and educational returns from digital engagement.

Source: Adapted from (Galperin & Mariscal, 2007, pp. 7-10)

Therefore, digital poverty must be addressed as inclusive policies that consider all of these dimensions in interaction with local circumstances and structural limitations.

With respect to vulnerable groups—including women, older people, rural populations, and people with disabilities—international reports and an array of studies (notable ones from DIRSI, the International Telecommunication Union, and Galperin & Mariscal (2007) have demonstrated that these populations are often the least able to take effective advantage of digital services, even when those groups have connectivity. This is frequently due to structural factors related to poverty, the lack of digital skills and various cultural and social barriers.

Hence, digital poverty is not simply the absence of infrastructure, but rather, it is a representation of what is called systemic exclusion, where social inequality itself is reproduced in digital space.

1.3. Digital Poverty in International Policies:

Digital poverty is increasingly recognized in international policy frameworks as one of the most prevalent forms of social inequality in the contemporary world. In their 2023 report, the Organisation for Economic Co-operation and Development (OECD) acknowledges that while digitization presents a great potential for social and economic inclusion it only reproduces social and economic inequalities when digital infrastructure and digital skills are not seen equivalently.

The report acknowledges that "digital access is not enough", if people do not have the capability to use both essential and functional digital skills including information literacy, problem solving and using different services afforded by digital technology (OECD, 2023, p. 6).

In this context, digital poverty has been considered a structural issue, moving beyond just "internet access" and including the divide in the effective and purposeful use of technology. As a result, we should shift the incorporation of digital policies into broader social justice policies, especially in the domains of education, work, health, and public service (OECD, 2023, pp. 3-5).

The digital divide breaks down among certain groups of people, such as the very old, those with less formal education, and those living in a rural context. For example, 42% of Europeans within the European Union are identified as having no basic digital skills, while the same assessment for the United States is 30% (OECD, 2023, p. 6).

UNESCO and United Nations reports call for moving beyond the "quantitative" approach, which measures digital success by the number

of devices or coverage rates, toward evaluation models based on quality, equity, and sustainability. This shift highlights the need to provide open training programs targeting disadvantaged groups—such as the unemployed, migrants, and persons with disabilities—in order to enhance their digital inclusion (UNESCO, n.d). The evolution of the notion of digital poverty suggests a development in the way the connectivity between technology and society is interpreted: it has moved from a purely technical paradigm to one that is holistic, and regards the issue of digital poverty as sociological, cultural and political. Digital poverty should no longer be applied exclusively to the lack of computers and internet access. Rather, it is an updated form of structural inequality which is being reshaped and reinforced in the digital landscape.

This theoretical understanding lays the groundwork for a broader analysis of the digital divide and its manifestations—an issue that will be addressed in the second section of this study through the analysis of affected social groups, indicators of exclusion, and potential intervention strategies.

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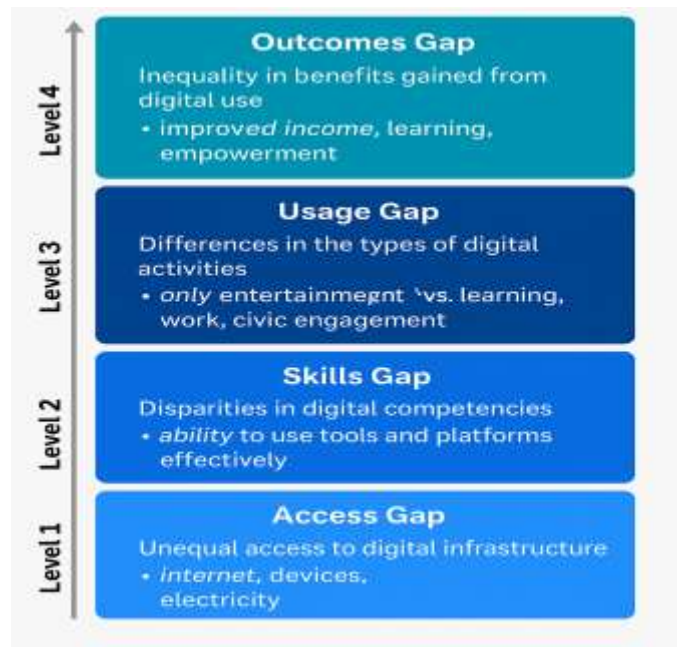
2. The Digital Divide and the Expressions of Social Inequality

The digital divide has entered both academic literature and as a public policy a new aspect of old inequalities. Access to technology and its use has become a major determinant of social inclusion and social exclusion. Digitization is often touted as a mechanism for empowerment and development, however the unequal capacity to enjoy digitization gives rise to multilayered divides, that, like social, economic, and culture are rooted in existing imbalances (Helsper, 2017).

2.1. Dimensions of the Digital Divide:

The digital divide is not limited to the technical aspect related to device ownership or internet access; it extends to deeper structural dimensions. In this context, researcher Ellen Helsper (2017) developed an analytical model that links the digital divide to four levels of inequality, as illustrated in the figure below (Helsper, 2017)

Figure N° 1: Levels of the Digital Divide According to Helsper (2016)



Source: Adapted from Helsper (2017)

As shown clearly in the figure above:

- **Access Divide:** Relates to the availability of infrastructure and technical resources.
- **Skills Divide:** Concerns individuals' ability to use technology effectively.
- **Usage Divide:** Refers to the nature of digital activities and the level of engagement with them.
- **Outcomes Divide:** Reflects the asymmetry in the social and economic benefits resulting from digital use.

This model has become a reference point in many comparative studies aimed at assessing the effectiveness of digital policies in reducing aspects of digital inequality.

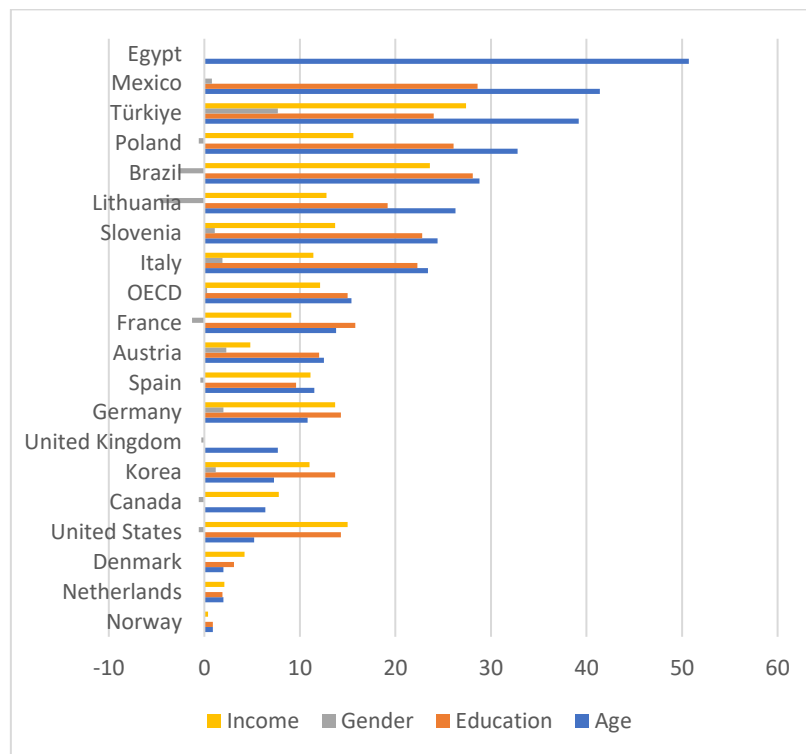
2.2. Diverse Groups: Between Digital and Social Inequality

Data reports that around 2.6 billion people (almost a third of the world's population) are still offline as of 2024 indicating a serious global digital divide (Poggi , 2025, p. 1) .

Studies conducted by the Organisation for Economic Co-operation and Development (OECD) show wide range of differences in internet use among different social, economic, and demographic groups because of differing adoption rates as a function of age, education level, gender, and income levels.

The following chart highlights these disparities:

Figure N°2: Divides in Internet use are pronounced by age, education and income



Source: Adapted from (UNESCO, n.d)

From the figure, we identified the most vulnerable social groups in terms of the digital divide, based on the following indices of social vulnerability:

- **Low income:** These are people who do not have enough economic resources to buy devices or to subscribe to internet plans. Across the world, developing countries are still far behind in internet access and

technology use. For instance, in the case of low-income and lower-middle-income countries, only 27% and 53% of the population are internet users, as compared to 80% and 93% in upper-middle-income and high-income countries (Poggi , 2025, p. 1).

In addition, in lower-middle-income countries, users pay six times their share of their monthly salary for a 2GB data plan, and nineteen times their monthly salary in low-income countries (Poggi , 2025), indicating that digital access is an affordable economic burden on these populations.

- **Rural and remote populations:** These groups suffer from poor technological coverage and unequal access to services. In 2024, the internet usage rate reached 83% in urban areas, compared to only 48% in rural areas (Poggi , 2025, p. 2). This underscores the urgent need for infrastructure investment in these regions to reduce the digital gap.

- **Women and young girls:** The gender digital divide is one of the most pronounced forms of inequality. In low-income countries, 90% of girls and adolescent females aged 15 to 24 remain offline, compared to 78% of males in the same age group (UNICEF, 2023). This gender gap in digital access translates into a skills gap, which limits girls' access to well-paying jobs and reinforces inequality in the labor market.

- **Old age:** Analysis of the data indicates that young users aged 16 to 24 use the internet 16 percentage points more than older users aged 55 to 74 (UNESCO, n.d), indicating an age disparity in digital usage that is constraining older users' ability to participate in an increasingly digital society.

- **Low education:** Those with higher education use the internet 15 percentage points more than those with low education levels (UNESCO, n.d). Education level is one of the most substantive contributions to determining an individual user capacity to access and use digital resources.

- **People with disabilities:** in addition to the above groups, people with disabilities face technical and design barriers that explicitly keep them out of the digital space. Only 3% of all websites are completely compliant for people with disabilities ¹ (Sabilano, 2022). A Pew Research Center U.S. national survey conducted January 25-February 8, 2021 found that 62% of adults with disabilities reported they had a desktop or laptop compared to 81% without disabilities. The gap between smartphone ownership for persons with disabilities and persons with no disabilities was 16 percentage points, as 72% of

persons with disabilities owned a smartphone versus 88% of persons without disabilities (Perrin & Atske, 2021).

The vast majority of websites offer in-accessible design and engineering features like screen reader access, color contrast, and reflow (AllAccessible, 2023), which creates yet another digital divide by restricting people's access to important information, digital services, and digital participation.

- **Other vulnerable groups:** According to recent studies on the digital divide, the populations affected by digital inequality are not limited to low-income individuals or older adults. Other social groups also experience overlapping forms of exclusion. It is important to highlight that marginalized racial and ethnic minorities, refugees and recent migrants (Andrey, Masoodi, Malli, & Dorkenoo, 2021, p. 4), as well as Indigenous communities (Raihan, et al., 2024, p. 120), are among the groups most adversely impacted by digital exclusion.

These groups face complex barriers, including language obstacles, limited digital skills, and the lack of culturally appropriate digital content, in addition to the high costs of internet access or purchasing digital devices.

Furthermore, Indigenous communities often suffer from a lack of communication infrastructure and insufficient digital training (Raihan, et al., 2024, p. 119), which deprives them of equitable access to health, education, and social services.

These barriers not only result in the digital marginalization of these groups, but also reinforce existing economic and social inequalities. This makes digital justice an urgent imperative to ensure fairness and empowerment for all segments of society—without discrimination based on origin, language, legal status, or place of residence.

2.3. Structural Contexts of the Digital Divide:

The expressions of the digital divide differ along geographical contexts especially in Asian and African countries, where digitalization policies are often uneven, concentrated in large urban centers and often disregard local digital cultures and the need for marginalized communities (Kagami, Tsuji, & Giovannetti, 2004).

In Latin America, investments in digital infrastructure made did not develop commensurately with skills or digital content, resulting in a double divide: access without effectiveness (Galperin & Mariscal, 2007).

In the Arab context, especially in Algeria, government statistics explain that access does not equal digital inclusion; in fact, it may enhance the illusion of structural digital vulnerability. For instance, even if 3G and 4G coverage is estimated to cover ~98% of citizens and internet access reaches 71%, use indicators establish several gaps.

From the perspective of gender, only 43%, of women, are internet users compared to 55% of men, representing a clear gender divide. Similarly, only 60% of rural households have access to the internet, from 81% of urban households demonstrating that spatial divide is also persistent.

But when the rate of active mobile internet subscriptions is very high (i.e., 100 subscriptions per 100 inhabitants) (ITU , 2023, pp. 1-2) , and despite the existence of digital technologies in any aspects of life, a pattern prevails when each sector, including health care and civic engagement, continues to use technology in a withdraws manner and has an uncoordinated manner. This repeats the thought of "limited use" of technology in everyday life, and it substantiates to the premise that just because it has quantitative infrastructure expansion, does not necessarily result in a full presence of digital inclusion.

2.4. From Digital Divide to Social Exclusion:

Digital inequality, if not addressed with inclusionary policies, can progress to social exclusion. According to Virginia Eubanks (2018), poor women in Troy, Michigan, for example, experience not only uneven access to technology, but technology that surveils and controls their social assistance. Eubanks characterizes this dynamic—what she calls "coerced digital inclusion"—as digitization with little empowerment, and a new dependency on technologies (Eubanks, 2018).

A similar concept is found in Couldry and Mejias's (2019) book, *The Costs of Connection*, where they articulate the concept of "digital colonialism." They suggest that data and technology can be employed as epistemic domination, rather than liberation, especially in the case of external entities who can impose digital models that do not fit local realities (Couldry & Mejias, 2019). Digital colonialism represents a structural dimension of the digital divide, where there are imbalances of knowledge power and digital sovereignty.

Warschauer (2003) also identifies the digital divide with the educational inequality legacy, noting that the lack of media and digital literacies in the educational system deepens not only knowledge

poverty but also impede people's ability to use technology for productive or political purposes.

More recent reports (ISPI, 2025) note that the digital divide has social impacts on access to employment, education, and health. The current labor market has an increasing need for digital skills across most industries, with some estimates projecting that by 2030, 40% of current skills will become irrelevant, and approximately 60% of the workforce will require re-skilling or re-training.

There are abrupt changes in relation to the vulnerable groups, such as women and youth. For example, girls are 35% less likely than boys to have digital skills, further promoting gender inequities in the labor market and reducing women's economic and social empowerment.

The same reports highlight that the limited representation of women working in technology and artificial intelligence leads to systems being developed that often reflect unconsciously biased and implicitly discriminatory outcomes, and exacerbate just as much as they mitigate underlying gender stereotypes.

Examples in the agricultural sector in developing countries—where women contribute 80% of all food produced (ISPI, 2025)—shows that limited access to agricultural technological innovations penalizes women's ability to participate in any digital transformations and constrains the growth of this sector.

While digital exclusion may not be limited to jobs, employment and learning opportunities, it also impacts health care. Turning to digital health care, a sector that is changing the healthcare delivery model through the use of telemedicine, electronic and interoperable health records, and artificial intelligence-based diagnosis. Data indicates that over 70% of countries worldwide have endorsed national digital health strategies with active digital programs mentioned in every region of the world (WHO, 2024).

Universal access to these services for many populations is not possible because of lack of appropriate infrastructure, funding and coordination, along with a lack of knowledge and cultural barriers, meaning that digital health exclusion is reinforced not diminished.

To sum it up, this section has shown that the disparate dimensions of the digital divide and the different impacts those dimensions have across social groups and/or communities should not be viewed solely as unequal access to technology or unequal access to the physical inspiration of the systems. What we observe in the digital divide can also be seen to be a higher order of dynamics of social exclusion from

other forms, using digital tools that may seem to have neutrality in the ownership of embedded political and economic choices. It is in this aspect that I will be analysing in the next section.

3. Digital Poverty and the Reproduction of Social Exclusion

Digital poverty is no longer a secondary consequence of technological changes; digital poverty is now one of the most visible expressions of social inequality during the digital age. Digitization has opened up new spaces for participation and empowerment, but it has also revealed a visibly more complex reality of renewed exclusion. The digital systems in our lives now reproduce structural inequalities already embedded in society—often in more complex and opaque ways. As digitalization embeds itself throughout all aspects of life, the opportunities of "digital democracy" are not being realized for all. On the contrary, field evidence and comparative studies of new forms of exclusion, driven through the digital divide, presents new dynamics that reinforce and exacerbate exclusion.

3.1. Digital Poverty as an Extension of Social Poverty:

Digital poverty has been redefined from being simply a lack of material resources for communication tools or technology, to being a structural condition reflecting and reproducing systemic class and social inequalities. Recent studies (Warschauer, 2003; Heeks, 2018; Eubanks, 2018) show that digital poverty should not be understood as simply "a lack of internet access", but rather a type of compounded digital deprivation that involves:

- Lack of technical infrastructure (access deprivation),
- Weak digital skills (skills gap),
- Lack of confidence using technology (confidence gap),
- Lack of educational and social institutions that facilitate the meaningful use (institutional deprivation).

Warschauer (2003) explains that the digital divide connects directly to educational and cognitive gaps. His book *Technology and Social Inclusion*, indicated that differences in technology use are primarily a result of differences in knowledge, institutional support, and the ability to convert technology into an economic and political empowerment tool - not about having the hardware or access to the internet.

Heeks (2018) is somewhat contrary, stating that digital poverty in developing countries doesn't just solve itself due to increased

digitization, but can sometimes exacerbate the marginalization and exclusion of groups of people if the use of digitization is developed and implemented without considering vulnerable and/or excluded groups. He offers this emphatic opinion by explaining that it is probable that any level of digital poverty will be removed only if there is a whole systems approach to transformation, that does more than build technical infrastructure, but also includes reforming social infrastructures and structures of knowledge.

Eubanks (2018), in her qualitative analysis of cases in the U.S. concerning poor women of color from the African-American and Latinx communities that she presents in *Automating Inequality*, highlights the way government digital technologies and practices—originally intended for functioning social welfare systems—have become justifications of a systematic regime of institutional control.

The welfare state's automated eligibility screening algorithms diminish recipients' access to the supports while placing unreasonable conditions on recipients. This is an illustration of what Eubanks describes as “digital cruelty”. She maintains these technologies do not lead to social justice, but are built on biases that paint the poor as undeserving of supports, and the digital systems are the new vehicles of systemic discrimination and marginalization.

In sum, the studies above illustrate that digital poverty means more than simply being unable to access technology. Investigating digital poverty demonstrated that it is a manifestation of broader deprivation that is entangled within class structures, technological policies, and social perceptions of “deserving” and “empowering” people.

In this sense, combatting digital poverty requires that we consider more than the logic of simply supplying the tools, rather, we require a more thorough means of dismantling systems that exclude, surveil, and devalue individual potential for digital and social agency.

3.2. Digital Poverty Arising from Forcible Inclusion:

As a concept, digital access is predominantly framed as a vehicle for social inclusion. Nevertheless, lived experiences in the field, along with more current theoretical literature, suggest that the forcible inclusion of individuals into digital technologies without adequate enabling infrastructure, may have unintended consequences. In those situations, technology becomes a technology of exclusion rather than empowerment, where aspects of surveillance and the potential replication of digital poverty arise.

Virginia Eubanks (Eubanks, 2018) has written about this in a field study, in which the researcher provides examples of vulnerable groups including poor women in Troy New York, who need to engage with government digital platforms, which represents a type of "forced digital inclusion" where instead of empowering these women, digital platforms place them under constant scrutiny through stringent algorithms that eliminate any decision-making ability or concept of independence, leading to a become even more reliant on technology without helping them develop genuine digital capabilities. Eubanks shows that these do not solve poverty, they instead reinforce it by creating new ways of digital and social marginalization as a replacement for old forms of service of social marginalization.

This view relates to "Digital Colonialism," a term defined by Nick Couldry and Ulises Mejias (2019). Digital Colonialism is a new type of epistemic and political oppression that is occurring based on the extraction of data from impoverished and oppressed communities, while providing little in the way of compensation, privacy, and dignity to these communities.

Couldry and Mejias (2019) argue that this process is similar to colonialism, in the way that it extracts resources and reconstructs communities to benefit others, and perpetuates inequality rather than reducing it.

Other research validates this anecdotally in Global South contexts. For example, fieldwork in India (Masiero & Arvidsson, 2021), and in Kenya (Wyche & Olson, 2018) has also shown how governmental digital systems that were designed to include marginalised peoples within social welfare programs have also been implemented with such complexity and without adequate technical and awareness support, that they prevalently become another barrier for these populations.

3.3. Digital Poverty and Educational Marginalization:

The education sector is an overt example of the intersection between digital poverty and social exclusion. The COVID-19 pandemic was a clear test of the digital inequities that were already present. According to RAND data (2020), teachers in schools serving high percentages of poor students reported that fewer than half were able to connect with most of their students. In testimony to Congress, they cited the absence of home access to the internet and devices (RAND, 2020). Digital inequality in American classrooms and schools can be subject to a racial and class dimension, as students from communities that are already marginalized can simultaneously be deprived of digital opportunities for education and culture alike. (Paul, 2016). Accordingly, strategies

that only focus on the mere provision of devices or internet connectivity, with no accompanying plan for support around digital use and training will only go a certain distance and would reproduce rather than reduce inequalities. Educational dealing with digital poverty requires an integrated and equitable approach to developing digital capacities, regardless of social class.

3.4. Digital Poverty and the Reproduction of Gender Discrimination:

Gender is one of the main axes of the digital divide. The current literature points out that women—particularly in patriarchal societies, or in contexts that are economically fragile—face exclusion from digital access causes by cultural, social and education inhibitions. These systems of exclusion not only remove access to work opportunities and vocational training, but also access to government programs (Ommundsen, 2024), and health and financial services—which in turn contributes to their economic and social vulnerability.

Yet, the paradox is that access in digital spaces does not guarantee that it will be a safe or empowering space. Women who are digitally literate and access technology are confronted with new forms of digital violence, primarily in the form of online harassment or through sharing personal information. All of which contribute to multiple layers of "digital vulnerability", where access that is not protected may reinforce marginalization rather than reduce it.

In this context, a new report published by the Cherie Blair Foundation for Women, alongside Intuit and the World Bank's Women, Business and the Law project, indicates that 57% of women entrepreneurs in low- and middle-income countries (LMICs) have dealt with online harassment on social media, and 21% are worried that male clients will harass them (Blair, 2025).

As a result of this unsafe digital environment, many women deliberately reduce their online presence. The same report revealed that 41% of women entrepreneurs intentionally limit their online activity, either by confining their engagement to women-only platforms or by reducing public interaction, which restricts their ability to expand into markets and promote their businesses (Blair, 2025).

These conclusions show that, as platforms currently operate, they often do not accommodate women's needs and may, in fact, replicate baseline patterns of discrimination or injustice in the digital realm. This requires a capital degree of rethinking technology policies so that the

digital environments we produce are, more justly and inclusively, produced.

Our analysis shows that digital poverty is not simply a lack of access to technology; it is increasingly a complex social reflection of deep-seated structural inequalities in societies. Digital poverty results from unjust incorporation processes, digital designs that disregard social contexts, and digital interactions that reinforce discrimination rather than denigrate or diminish it. Thus, intersectionality can't be reduced to a simple observation; it is a rage of accounts. Thus, it is irresponsible to reduce the digital-political problem down to a policy flattening exercise whereby access or just where technology use happens, becomes a solution. We need to broaden our frames of the digital to, in fact, narrow down our focus on policies for digital justice that also recognize knowledge rights, the specificities of marginalized groups, and the possibility or practice of truly democratic and inclusive digital spaces.

4. Digital Justice as a Strategy for Empowerment and Equity

Given the growing digital divide and its increasing societal impact, relying on conventional views focused on infrastructure or the notion of connectedness generalized is no longer adequate. It has been necessary to undertake a richer and deeper view, now commonly referred to in new literature as digital justice. Digital justice does not simply propose to erase the technological divide; it also interrogates whose relationships to the digital space are being examined, who is excluded, and how it can be transformed into a platform of empowerment and participation instead of exclusion and dependency.

4.1. From Digital Divide to Digital Justice:

Since the 1990s, public policies in many countries around the world have engaged in addressing the digital divide by increasing access to the internet and the infrastructure. However, over time, several studies have indicated some boundaries to that method—in particular, the study of Warschauer (2003) showed that access is not enough. The divide also lies in digital skills, institutional support, and cultural marginalization that impede people's capability to leverage connectivity into real empowerment (Warschauer, 2003).

In the context of this struggle the notion of digital justice arose, it is understood as antagonistic to the technical notion and embodies a right to equitable, safe access to tools and the applications of technology in a

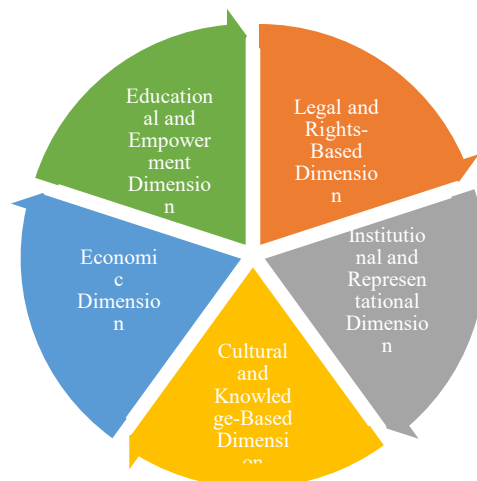
setting that is consistent with respect for individual rights, privacy and their cultural and social needs (Couldry & Mejias, 2019).

Digital equity builds upon this idea and realises that access must ensure that everyone actually benefits from digital connectivity by getting rid of structural barriers that limit certain protected groups from fully participating in the digital society. This also includes the provision of universal digital skills training education programs, diverse technical support for users, and designing applications and online content that allow users to self-serve and participate in their communities.

Today, internet access is being called a necessary public utility described like clean drinking water or electrical energy. The objective is to make internet access available to all users with rich content and platforms available, affordable, open or free at the very least, and safe. While internet access may not be free, leasing or owning an internet access point must be governed by public policy and taxpayer investment such that internet access should not be an obstacle to marginalized populations (Sustainability Directory, 2025). This also must be take into consideration of specific needs associated with specific groups - women and girls, seniors, persons with disabilities, First Nations, and low-earner populations, who have typically experienced extreme exclusion from the digital society.

Based on the above, digital justice is built upon five interconnected dimensions that reflect the comprehensiveness and integrative nature of this concept:

Figure N° 3: The Five Dimensions of Digital Justice:



Source: Adapted from (Couldry & Mejias, 2019), (Leslie, et al., 2022), (Raihan, et al., 2024)

The Legal Dimension: This is focused on guaranteeing the legal protection of foundational digital rights, such as personal data safeguarding, privacy, and the right to freedom of expression in the digital space (Leslie, et al., 2022, p. 12). Also, safe and equitable access to digital resources without discrimination is included.

The Institutional and Representational Dimension: The focus here is the inclusion of marginalized groups in decision-making that relates to technology and digital policy (Leslie, et al., 2022, pp. 13-15). This front also relates to challenging the trend toward the monopolization of digital governance by big tech companies, or elite technocrats in the space, by embedding transparency in decision-making and democratizing the digital space.

The Cultural and Knowledge Dimension: This is about providing individuals and constituencies with the ability to engage actively and consciously in digital culture (Couldry & Mejias, 2019). This also relates to expanding their ability to create content, affirm their identity and values around cultural diversity, and place their local context in the design of digital platforms/applications that meet the cultural specificities and address the intersectional needs of groups seeking equality (e.g. older persons, recent migrants). Many scholars have discussed this aspect as one of being the notable factor aimed at enabling these groups to engage equitably in the digital realm (Raihan, et al., 2024, p. 118).

The Economic Dimension: This one makes sure that different groups can afford connectivity, devices, and IT services (Raihan, et al., 2024, p. 118).. If there is no policy supporting vulnerable groups, for earnest, the digital space has now become a privilege aligned with class-based status instead of a public right, thus carving greater divides instead of connecting them.

The Educational and Empowerment Dimension: The educational part aims to eliminate digital illiteracy, by enhancing individuals' technical and cognitive capacities to engage with digital media. This involves the provision of continuous training and promoting technologies' contradictions between critical and irresponsible use and the responsibilities associated with technology (Raihan, et al., 2024, p. 118), to facilitate one's transition from passive consumers to active digital participants.

Given the foregoing, digital empowerment can only be realized if digital policies adopt a broad social justice agenda. This raises the fundamental basis for the construct of digital inclusion, which is about much more than the provision of connectivity services. It encompasses access to and knowledge of use, as well as meaningful and effective use, with support from base human and social structure.

4.2. Digital Justice and Education:

Field experiences have shown that focusing digital justice toward education is one of the most effective opportunities to realize empowerment. They also show that when considering education and digital justice, connectivity is not the only piece of the puzzle, but there must be a connected enabling infrastructure. According to the Advancing Digital Equity for All report published by the U.S. Department of Education (2022), schools that adopted inclusive policies—such as continuous technical training for both students and teachers, comprehensive technical support at the school level, and the integration of digital justice into policies and curricula—achieved better outcomes in narrowing the educational gap, especially during and after the COVID-19 pandemic, compared to schools that limited their efforts to internet access or digital devices alone (U.S. Department of Education, 2022).

In the context of India, Ferris et al. (2022) referenced the experience of marginalized gender and social groups who, as schoolgirls in rural India, benefitted less from the expansion of digital education during the pandemic because of a digital usage gap influenced by social and economic factors, not just technical factors. While the state offers advanced digital infrastructure for commercial and economic purposes, this progress has not been equally reflected in educational institutions, where the usage gap persists based on gender, geographic location, and economic capacity (Ferris, Clarke, Raftery, Liddy, & Sloan, 2022).

According to a study conducted by Jonathan D. Becker in 2006, digital disparities within educational institutions are not limited to the availability of devices, but also extend to the quality of use, socio-economic contexts, and the nature of educational interaction with technology. It was shown that schools serving low-income communities or racially ethnic minorities had less privilege of technology or at least nominal access. Simply provided with technology students in these schools are likely to be lower in access levels, use technology ineffectively or, and not have the technology impact their academic results and include them digitally (Becker, 2006). This problem confirms the gap is more than access, it is also in

empowerment, and effective use of digital technologies—two areas that directly impacts educational results and students' digital and cognitive integration.

These findings show that we can only claim to achieve digital justice in education if we:

- Consider comprehensive plans, not only digital infrastructure, but also the training of the teachers and students and the option to obtain suitable educational content.
- Monitor and/or assess the actual use of technology in conjunction with the educational processes, distinguishing whether technology is providing meaningful benefit as opposed to superficial or symbolic forms of engagement.
- Be aware of the social and digital economic disparities that exist within the education system, acknowledging this without stigma, and creating targeted support that supports the most vulnerable.

In this way, education stands as one of the most significant pillars of digital justice, not as a sector equipped with "tools", but rather as the planned, strategic channel for fair digital transformation that develops individual capabilities and contributes to common social purpose.

4.3. Digital Justice in the Era of Big Tech Dominance:

The ascendance of major technology enterprises (Big Tech), including Google, Meta, and Amazon has transformed them into sovereign digital powerhouses which many nation-states are not able to match in terms of the restrictions of their power to control their data, algorithm, and infrastructure. The powerful nature of Big Tech has exposed the limited ability for states, especially developing nations, to effectively regulate these platforms without strong institutional regulatory frameworks and legislative systems.

In this situation, data colonialism is a term that refers to the actions of dominant technology companies, in which individuals' and collective data are extracted without the consent of these individuals and without their meaningful participation in decision-making. These actions also reproduce unequal, dependent relations whereby digital value is extracted from the most exploited populations (without either compensation, or real empowerment) and generate possibly new colonial patterns in today's digital space (Stürmer, Nussbaumer, & Stöckli, 2021).

Eubanks (2018) critiqued what she described as "**automating inequality**" and referred to the injustices caused by government systems that employ biased data or fail to account for social disparities with algorithms (Eubanks, 2018). Following this, today, we might argue that digitization is often representative of data colonialism, in the sense that it reproduces dependency rather than liberation.

Accordingly, reaching digital justice in the growing dominance of digital requires a strategy for governance. A governance strategy must include: Enact legislation to ensure data and technology are used fairly and transparently; build accountability; and, involve actors from civil society and independent technical experts to address the power of digital corporations, achieve digital sovereignty for states, and empower individuals online.

4.4. Digital Justice and Participatory Governance:

Participatory governance is viewed as an important pathway to digital justice (it cannot happen via merely top-down). More specifically, toward achieving this, there does have to be an avenue of participation for local people, civil society, and researchers in the development of digital policies and their initiatives. These acts of participatory governance reflect the need to provide access and opportunities for marginalized communities to participate in digital decisions and, ultimately, reinforce the principles of digital sovereignty and social accountability.

Hovik and Giannoumis (2022) aligned their findings with this view in their findings related to digital participation in municipalities. The focus of their research was on how multiple digital participation tools (e-participation) allowed municipalities to develop citizen-based online platforms where citizens expressed their perspectives and could be involved in the participatory and transparent evolution of local policies. Their study's findings related to local governance show that municipal e-participation can contribute to the legitimacy of public decisions, and enhances local governance (Hovik & Giannoumis, 2022, pp. 4-6).

The OECD Digital Education Outlook (2023) report emphasizes the importance of adopting a comprehensive digital governance approach that includes clear regulatory guidelines (guardrails) and supportive institutional frameworks that regularly monitor implementation standards and the quality of outcomes. This is essential to avoid the application of uniform digital models that overlook varying national needs and local contexts (OECD, 2023).

The OECD report "Digital Technologies for Inclusion in Education" (2023) also underlines that education technology should be developed and used with an understanding of the social and cultural diversity of learners. Along with sufficient digital infrastructure, means for professional development for teachers, and systemic monitoring and evaluation, were also important factors for making digital education more inclusive and equitable (Gottschalk & Weise, 2023).

Based on the above, the pursuit of comprehensive digital justice cannot be separated from the establishment of participatory governance models that ensure the involvement of historically marginalized groups in shaping and evaluating digital policies. Fair digital transformation is not measured solely by the expansion of infrastructure or the distribution of devices, but by the ability of individuals and communities to influence the technological pathways that reshape their reality.

This analysis in this section indicates that digital justice is not simply a technical option or an administrative move - it is unequivocally a social and political decision that intersects with the essence of the relationship between technology and citizenship. It is a challenge to reconstruct the digital space in a manner that is equitable, transparent, and accountable - allowing technology to be a resource that liberates us, rather than one that enslaves us. Digital justice begins in the design phase, enters into policy, and is only realized when platforms represent and work for all.

CONCLUSION

The five axes discussed in this article show that digital poverty represents more than a mere technological gap; it is a new type of structural marginalisation that is nourished by the historical remnants of inequality and sustained by political, economic and cultural systems that increase the marginalisation of vulnerable groups in our society, such as women, the elderly, rural populations, and lower socio-economic groups. This should prompt us to revisit digital policies not as infrastructure, but to revisit them as social justice issue.

While traditional approaches continue to focus on "bridging the digital divide," this alone is insufficient without strategies that empower vulnerable groups to use technology critically, productively, and meaningfully. Comparative experiences from Global South countries—such as India, South Africa, Brazil, and Kenya—have shown that successful digital inclusion can only be achieved by integrating technology into broader development projects, adapting it to local needs, and ensuring its long-term sustainability.

Thus, digital justice signifies a hopeful horizon for the recommitment to individual rights in the digital world, thus constituting a right to connectivity and a right to data protection, and the rights to equitable participation and equitable education. Such hope emanates from the urgency it demands: moving from "providing access" to digitally empowering citizens.

In this sense, addressing digital impoverishment as an indicator of social marginalization has to involve:

- Comprehension of policies and programs that connect technology to social and cultural contexts, rather than seeking technical solutions only
- Early-stage investment in digital education, with a focus on gender and geographical considerations.
- Promoting open local content and multilingualism in the digital arena.
- Empowering civil society to monitor digital inequalities and participate in digital governance.
- Creating inclusive legal frameworks that protect and ensure fair treatment in the digital sphere.

In the face of an increasing digital divide, we must interrogate political discourse of "digital transformation" and "artificial intelligence" and put the human being at the centre of every technological effort. The continued absence of digital justice will only ensure that technology is perpetuating inequality, recreate it, and continued marginalization will be replicated, rather than overcome.

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