The Digital Divide

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Abstract

The COVID-19 pandemic highlighted the digital divide as a critical social inequality revealing disparities not only in access to technology but also in motivation, skills, and meaningful usage. This divide functions both as a dimension of inequality, shaped by socio-economic status, age, and other factors and as an axis of inequality influencing crucial life chances like education, employment, and health outcomes. This editorial emphasises the importance of social policy for bridging these gaps. Research and policy interventions should address four dimensions of the digital divide: how to ensure affordable and ubiquitous material access through infrastructure and subsidies; develop comprehensive digital skills and literacy through education and community programmes; promote beneficial digital use through accessible content, inclusive design and trust-building measures; and tackle institutional and systemic barriers through coordinated, equity-focused policies, and robust monitoring.

Keywords: Digital divide, inequalities, conceptual frameworks, COVID-19

Introduction

The Covid-19 pandemic triggered a push for the digital transformation of society as a result of public health measures such as social distancing, home schooling and "working from home" rules to contain the virus. Processes of digitalisation can be observed in all countries, albeit in different forms and at different pace (Ragnedda/Muschert 2013; Köksal/Ulum/Genç 2023; Hadjar/Torabian/Toom 2025). Whether it is contact with public administrations, financial transfers, practices in education, the organisation of work and leisure time or people's engagement in the online dating market, the internet has become more important in all areas of life. But not everyone can use the internet equally. Inequalities in access to the internet but also in the ability to use its benefits and minimise its dangers, are a topic of public, political and

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scientific debate. Digital inequalities seem to reinforce social inequalities along the lines of relatively stable advantages and disadvantages in access to resources and positions (Kreckel 2004). Inequalities appear on different levels, for example between societies that are more or less developed or industrialised or between information-poor and information-rich people within societies (Norris 2001). Prominent axes of inequality such as education, ethnicity, gender, age and socio-economic position, as well as geographic location, appear to be particularly salient in shaping the "digital divide" (e.g. Van Deursen 2020; Van de Werfhorst/Kessenich/Geven 2022; Papí-Gálvez/La Parra-Casado 2023) and there is a risk that digitalisation further increases these inequalities (van Dijk 2005). The widespread use of digital means across all life domains during the Covid pandemic, rather than contributing to a reduction of digital inequalities, exacerbated inequalities and made them more visible. In particular, older people, people with low levels of education, socioeconomically deprived people, people with physical impairments, low literacy or low internet skills remain digitally disadvantaged (e.g., Van Deursen 2020; Litchfield/Shukla/Greenfield 2021; Köksal et al. 2023). This thematic issue includes empirical articles related to digital inequalities from a temporal perspective (e.g., the development in the 20th century or during the Covid19 pandemic) and/or international perspective as well as empirical studies on social policies with a focus on the reduction of digital inequalities or on the interplay between social work and social policy practices with digital inequalities.

The Digital Divide as an Inequality Dimension and Axis of Inequality

An attempt to define the digital divide reveals a complex multifaceted phenomenon. The Organisation for Economic Co-operation and Development (OECD) provided an early definition of the digital divide as "the gap between individuals, households, businesses and geographic areas at different socio-economic levels with regard both to their opportunities to access information and communication technologies (ICTs) and to their use of the Internet for a wide variety of activities" (OECD 2001, p. 5). This definition emphasises access to technology at different levels (individual micro level, meso level of institutions and macro level as societal level) as the core aspect of this phenomenon.

Van Dijk (2006, p. 222) defined the digital divide in similar terms as "the gap between people who do and do not have access to forms of information and communication technology", with computers and the Internet at the core, but highlighted that "access" does not simply mean access to the technology. Providing hardware or internet connections (material access) is not enough to bridge the digital divide. People also need to be motivated to use it, possess the necessary skills to navigate and understand it and engage with it in ways that are meaningful and beneficial to their lives. Van Dijk (2006) identified the following forms of access:

Motivational access refers to the willingness or desire to use the internet and is specified as an initial psychological barrier or enabler for engaging with digital technologies. It addresses the question of why people would want to go online. Lack of motivational access can stem from various factors, such as perceiving no personal need or significant usage opportunities, a lack of interest or time, a rejection of the medium (e.g., due to privacy concerns or information overload) or even technophobia.

Material access relates to the physical availability and affordability of internet technologies, namely whether individuals have the necessary hardware (e.g., computers, smartphones, tablets), software, a reliable internet connection (e.g., broadband) and the financial resources to acquire and maintain these. This dimension relates to the original idea of the digital divide, the economic and infrastructural barriers to getting online.

Skills access refers to the competencies and knowledge required to effectively use the internet, also coined with the term digital literacy. Van Dijk distinguishes between different levels of skills: Operational skills in terms of basic abilities to operate hardware and software (e.g., turning on a computer, using a mouse, opening a browser). Formal information skills in terms of navigational skills to understand and handle the structure of the internet (e.g., using hyperlinks, understanding file structures, navigating websites). Substantial information skills in terms of the ability to find, select, process and critically evaluate information found online. And finally, strategic skills defined as the capacity to use internet resources for specific goals and status attainment (e.g., for education, career advancement, civic participation).

Usage Access is the highest-order dimension as "having sufficient motivation, physical access and skills to apply digital media are necessary but not sufficient conditions of actual use" (van Dijk 2006, p. 229). Usage access relates to the actual frequency, diversity, and meaningfulness of internet use. It examines how people use the internet and for what purposes. A usage gap can exist even among those with material and skills access, as individuals may use the internet for different activities, with varying intensity and for different outcomes. This includes differences in the types of applications used (e.g., for entertainment vs. education vs. civic engagement), the amount of time spent online, and the depth of engagement.

Multifaceted access to the Digital constitutes both an axis and a dimension of inequality. While axes of inequality are the underlying social cleavages or categories that structure (although not causally produce) systematic differences, relating to the groups that experience inequality, dimensions of inequality in turn are the outcomes or the specific manifestations of inequality in terms of access to valued resources and positions, that is to say they are the output or the things that are unequally distributed (Hadjar/Gross 2016). Access to the Digital is a dimension of inequality as the different forms of access (motivational, material, skill and usage access) are structured by conventional axes of inequality such as socio-economic status, educational level, age, migration/ethnicity and (particularly at the beginning of the digitalisation) gender, with for example socio-economically disadvantaged and older age people being less able to access the Digital (Noll et al. 2001; van Dijk 2006). When, on the other hand, we look at access to the Digital as an axis of inequality this draws attention to the differential outcomes for people depending on the extent to which they have access to the internet. Particularly with increasing digitalisation, having no access to the internet or showing specific usage patterns may structure other inequalities, such as disadvantages in education, labour market chances, income, political participation and health. For example, with today's frequent online discounts on tickets and consumer goods, the digitally-literate people are better able to save money. During the COVID-19 crisis, before and beyond, people with access to the Digital and using the Digital in a way that would support learning activities have been advantaged in the uptake of education. People with a digital skill lack are also less prepared and less attractive for the labour market.

Conceptual Frameworks to the Digital as Dimension and Axis of Inequality

Drawing on the more detailed exploration of conceptual and empirical accounts provided by Hadjar et al. (2025), in the introduction of this thematic issue we focus on three concepts:

The first concept, the Knowledge-Gap Hypothesis (Tichenor/Donohue/Olien 1970) may contribute to the explanation of the persistence and even increase of digital inequalities in terms of disparities in the (multifaceted) access to the Digital – "the digital divide" as a dimension of inequalities structured by other axes of inequalities such as socio-economic status or age. The core argument of an application of this theoretical framework on the digital divide is that as mass media and digital information increases, higher socioeconomic status (SES) segments acquire information faster than lower SES segments, widening the knowledge gap. Digitally related knowledge and skills are more easily acquired by already advantaged, highly educated individuals. This is due to certain mechanisms: higher educated individuals possess better communication skills (reading, comprehension, memory). Higher SES/educated individuals are more exposed to "quality media" and have accumulated more prior knowledge, making it easier to integrate new information and skills. Relevant social contacts among higher SES/educated individuals foster earlier discussion and reflection on new topics like digital technologies. Higher SES/educated individuals often show stronger motivation and interest in engaging with new topics. Market-oriented media caters to and reproduces the interests and profiles of higher-status audiences, providing more stimulating digital input to them.

While the Knowledge-Gap Hypothesis (Tichenor et al. 1970) relates to access to the Digital as an outcome in terms of a dimension of inequality, the second concept – the Social Production Function (SPF) theory (Lindenberg 1996, Ormel et al. 1999) – helps to theorise the Digital as an axis of inequality that structures several outcomes regarding life chances. The theory can be used to explore how digital access and familiarity contribute to achieving instrumental goals that lead to subjective well-being (Hadjar et al. 2025). With the general assumption that individuals achieve subjective well-being via the achievement of five first-order goals – stimulation (keeping a certain arousal level and absence of boredom), comfort (meeting physical needs), status (attaining certain positions and gaining prestige), behavioural confirmation (being in line of own expectations and reference group expectations) and affection (emotional relationships with other people) – the SPF allows for a systematisation of outcomes of multifaceted access to the Digital on life chances and the final outcome subjective well-being. With regard the goal of stimulation, digital tools (games, music/video portals, consumption sites) are major facilitators, often outperforming offline options, serving as a primary antidote to boredom. With regard to comfort, internet consumption/competence facilitates physical needs linked to comfort (e.g., searching for housing) and security, and can even produce virtual feelings of comfort. As digital literacy is linked to income (see for example the findings of Edler/Kristal in this volume), this constitutes an additional indirect link between access to the Digital and comfort, as comfort can be bought. With regard to status, digital literacy contributes to prestige and objectively enhances educational and labour market chances, as digital proficiency is increasingly a requirement in these sectors. At the same time, considering the 'upper rich' it might be a sign of status if one does not have to use digital devices or be connected continuously with the internet. With regard to behavioural confirmation, the Digital provides

information on reference group expectations and facilitates meeting these expectations (e.g., peers expecting digital literacy and online interaction). Finally, even the achievement of affection is facilitated by the Digital, as digital tools are crucial for initiating and maintaining social relationships, with increasing importance of online dating and widespread use of social media and email for social interaction. In turn, a lack in access to the Digital – for example among low SES people, older-age people and immigrants – may result in exclusion from many resources and activities to achieve subjective well-being.

A third conceptual framework theorises the Digital both in terms of an inequality dimension (as outcome itself) and in terms of an axis of inequality that structures other unequal outcomes has been presented by van de Werfhorst et al. with respect to the field of education (2022). Building upon established concepts of the digital divide (van Dijk, 2005, 2006), their work extended and systematised a multi-layered understanding of digital inequality in education by empirically investigating these dimensions and examining how socioeconomic background, gender, and migration status predict disparities across these different layers of digital preparedness in students and schools. By emphasizing contextual and institutional dimensions, van de Werfhorst et al. (2022) establish a link between social policy and the digital divide: digital inequality is not just about individual access, skills, and usage, but also critically depends on the digital resources, infrastructure, and pedagogical practices within educational institutions (e.g., schools) being subject to social policy interventions.

The first level and foundational layer of the digital divide relates to (material) access to devices and the internet. This is about whether individuals (e.g., students) have the necessary hardware (computers, laptops, tablets, smartphones) and a stable internet connection at home – varying for example along the axis of inequality of socio-economic status.

The second level of the digital divide relates to digital skills and usage and respectively focuses on the ability to use digital technologies effectively (digital literacy, operational skills, information skills) and the patterns of engagement (how frequently, for what purposes, and with what diversity of applications technology is used). These aspects also vary by socio-economic background with higher SES people using the internet more efficiently and effectively to reach certain goals.

The third level of the digital divide relates to outcomes and benefits of access to the Digital and being digitally literate. This refers to the extent to which individuals are able to convert their digital access, skills, and usage into tangible positive outcomes, such as better educational achievement, improved labour market prospects, or enhanced social and political participation. The introduced framework to study how the Digital as axis of inequality shapes subjective well-being would also fit in here.

The fourth level of the digital divide relates to the institutional level and the question of the digital preparedness of specific institutions. In the study of van de Werfhorst et al. (2022) the focus is on the school context and the education system, but any social policy context can be theorised relating to this fourth level. Considering the example of educational contexts further, aspects include the digital infrastructure of schools (e.g., availability of devices, internet connectivity in classrooms, IT support), teacher preparedness (teachers' digital skills, confidence in using technology for teaching), and the school-level use of the Digital and particularly internet and communication technology (ICT) in instruction (how integrated

digital tools are into the curriculum and daily teaching practices). The main argument with regard to the role of the institutional level is that even if students have individual digital readiness, their educational outcomes are also dependent on the digital environment provided by their schools. This highlights a multi-level digital divide where individual and institutional factors interact.

The Role of Social Policy in the Digital Divide and Possible Interventions

While the relevance of institutional settings and policies was already tapped into in the last section, this section discusses the importance of social policy for tackling the digital divide by presenting a model by Hadjar et al. (2025) that is based on the classical structural-individualist approach by Coleman (1990). The model by Hadjar et al. (2025) focuses on two aspects of the digital divide, aspects of material resources (digital infrastructure) and aspects relating to incorporated capital (digital skills and usage). The model outlines a top-down influence and a feedback loop across three levels: At the macro level, national/sub-national digital policies and other policies that link to the Digital and digitalisation shape the digital landscape. These policies determine how institutions (meso level) provide, promote, and diffuse access to the Digital and related digital skills. Policies not sensitive to existing inequalities will widen the digital divide by disproportionately benefiting already advantaged groups. Conversely, targeted policies can decrease individual digital disadvantages. On the meso level of institutions, organisations like schools, libraries, and public services are situated. Such institutions respond to macro-level policies by providing access to the Digital, promoting its use, and fostering digital skills. Institutional practices directly mediate the availability and encouragement of digital engagement for individuals. Meso-level provisions and requirements shape the individual and the immediate social environment (family, peers) on the micro (respectively the micro-social) level by influencing individual access to the Digital, attitudes towards it, and digital skills. Differences in access, skills, or attitudes between social groups lead to differing digital usage patterns (frequency and profiles, e.g., informative vs. entertainment) and have, depending on skill and access levels, positive or negative, consequences for life chances, affecting education uptake, labour market opportunities, and health. Limited or specific usage (e.g., entertainment-only) can harm these chances. Considering the continuing loop, individual usage patterns shape meso level institutions and finally macro level conditions and policies (Hadjar et al. 2025; p. 7). Recent accounts (such as the study of Sanders/Scanlon 2021 focusing on California/US) frame measures against the digital divide as an issue of inclusion and human rights. This perspective calls for robust social policies to ensure equitable access and to prevent digital redlining and further marginalisation of vulnerable groups. To provide equal access (broadband internet), digital skills and motivation of people to use the internet in ways that positively contribute to their social, economic, and political lives is perceived as a major task for social policy and social work.

However, scientific accounts of possible policy interventions are rare. Systematising some selected reports, we suggest the following interventions regarding the four layers of the digital divide:

Addressing the first-level divide (access), the following measures appear to be effective: ensuring affordable and ubiquitous access through infrastructure investment, especially in underserved rural and low-income urban areas; affordability programmes involving subsidies for internet services, low-cost internet plans, and public-private partnerships to provide affordable devices; and public access points expanding free public Wi-Fi hotspots in community centers, libraries, schools, and public spaces (Federal Communications Commission 2025; Lythreatis/Singh/El-Kassar 2022; Maram/Ruggeri 2013; OECD 2025). In this volume, Senne highlights in his conclusions from his research on Brazil the measures of subsidising internet use and devices, as well as implementing support services that facilitate internet access. Fiedler/Kerschbaumer (in this volume) highlight in the same vein measures supporting universal access to digital technologies.

Tackling disadvantages related to the second-level divide (skills) could center on developing digital skills and literacy. This would involve inclusive digital education integrating digital literacy into all levels of education, from early childhood to adult learning, including operational skills as well as critical thinking, online safety, and information evaluation. Community-based training programmes and teacher/educator training are also part of this set of measures (Chansa Thelma et al. 2024; Pérez-Escolar/Canet 2023; Senne in this volume). Fiedler/Kerschbaumer (in this volume) emphasise the importance of community organisations as well, as these can build trust and empower individuals providing access, skills and motivation for the use of the digital.

With regard to the third-level divide (usage), promoting usage and outcomes that benefits the individual users appears to be meaningful. This includes encouraging the development of online content and public services that are accessible, culturally relevant, multilingual, and meet the diverse needs and interests of all population groups. Mandating "digital-by-design" principles for public services, ensuring they are user-friendly, accessible to people with disabilities, and offer non-digital alternatives where necessary. Programmes that specifically leverage digital tools to enhance civic participation, democratic engagement, health outcomes (e.g., telehealth access), and economic opportunities (e.g., online job search support, e-commerce skills for small businesses. Finally, addressing concerns about online privacy, security, and misinformation through public awareness campaigns and regulatory measures to foster trust in digital environments (OECD 2025; Sanders/Scanlon 2021; Van Deursen/Van Dijk 2019; Warschauer 2003).

Addressing the fourth layer, namely institutional and systemic factors directly, policy coordination as well as monitoring and evaluation are at the focus of interventions. This includes the development of integrated national and sub-national digital inclusion strategies that coordinate efforts across various policy domains (education, health, employment, social welfare), establish robust systems to monitor digital inclusion metrics, identify at-risk populations (e.g. older people), and evaluate the effectiveness of interventions. Ensuring that digitalisation policies are designed with an explicit equity lens as to avoid inadvertently widening gaps by favoring digitally privileged groups, is also of importance (Lythreatis et al. 2022; OECD 2025; Ragnedda/Muschert 2013; van Deursen/Van Dijk 2018).

The COVID-19 Pandemic and the Digital Divide

The COVID-19 pandemic significantly intensified existing discussions on digital inequalities, as numerous in-person activities shifted to virtual environments, transforming internet access from a convenience to a necessity for work, education, healthcare, and social connection. Thus, the main impacts of the COVID-19 pandemic regarding the digital divide are mainly rooted in an increasing importance of the Digital and the fact that pandemic-related changes did not affect all people in the same way or to the same extent. Socially disadvantaged individuals were more affected by the COVID-19 pandemic's negative consequences (e.g. increase in mental health problems, disrupted uptake of education) resulting in an increase in inequalities (Darmody/Smyth/Russell 2021; van de Werfhorst et al. 2022). Gender inequalities were increased as women, and in particularly mothers, where disproportionally negatively affected by the pandemic (e.g. Naumann et al. 2022; Hjálmsdóttir/Bjarnadóttir 2021; see also Bhagat/Banerji in this volume).

Gaps in internet access and affordability widened as the pandemic made reliable, high-speed internet crucial, but many households, particularly in rural and low-income areas, lacked adequate access or could not afford it. Furthermore, the sudden surge in online activity due to remote work and learning put a significant strain on digital infrastructure, particularly in underserved neighborhoods. In some cases, existing cellphone-dependent hotspots became overextended and unable to meet the increased demand for distance learning (World Economic Forum 2021). With essential activities moving online, this created critical challenges for those without sufficient access to internet services (Lai/Widmar 2021). Studies revealed that Black and Hispanic/Latino adults were twice as likely to cut internet services due to financial strain during the pandemic (Early/Hernandez 2021).

Digital inequalities became more evident in skills, usage, and usage profiles than in basic access to technology, although regional differences in broadband access and socio-economic differences in availability of computers and smartphones exist. At the start of the pandemic and the closure of in-person services (e.g. schools), digital literacy became suddenly extremely important, as individuals would need to switch to online modes in all forms of communication with work, school or family. Individuals with higher digital literacy were better equipped to manage the limitations imposed by the pandemic, compared to those lacking digital knowledge and skills (Darmody et al. 2021; van de Werfhorst et al. 2022).

School closures and the shift to remote learning highlighted vast disparities in access to devices and internet connectivity among students. Children from disadvantaged backgrounds were significantly less likely to have the necessary equipment or stable internet connections for online schooling, leading to learning losses and widening educational gaps (Naumann et al. 2022). Considering digital skills, among the students, high socio-economic status (SES) students, girls, and students without a migration background demonstrated significantly higher digital skills. High SES students also used digital devices more frequently for school activities than low SES students van de Werfhorst et al. 2022). Socioeconomically advantaged youth, generally more digitally literate, could maintain and form new relationships online, while disadvantaged youth, lacking technology access and parental digital skills, suffered more severe isolation from friends and peer groups (Beaunoyer/Dupéré/Rousseau 2020; van de Werfhorst

et al. 2022). School closures and reduced social interactions during the pandemic disproportionately affected students from disadvantaged social and ethnic backgrounds, deepening educational inequalities (Darmody et al. 2021). Gibson et al. (2021) found in their systematic review of 117 studies that socially disadvantaged groups, including those with lower income and educational levels, along with ethnically and sexually marginalised identities experienced greater mental health challenges during the pandemic. Numerous studies found that the pandemic had a strong gendered impact. Naumann et al. (2022) identified increased mental health risks particularly for mothers of younger children during lockdowns due to the increased burden of care and housework-related activities which were not evenly shared between men and women. Bhagat/Banerji (in this volume) show for India that conditions for women became worse during lockdowns as conflicts between work life and caring duties increased and they experienced worse conditions for remote work than men. Van de Werfhorst et al. (2022) highlight that a notable consequence of the pandemic was the potential enlargement of inequalities in digital skills and usage, and their subsequent effects on students' educational outcomes.

As healthcare services, appointments, and public information increasingly moved online (e.g., telemedicine, vaccine registration), those without digital access or skills faced significant barriers. This disproportionately affected older adults, ethnic minorities, and individuals with disabilities, who often struggled to utilise digital health technologies (Litchfield et al. 2021; Pacheco/Burgess 2024).

With increasing importance of digital provisions, an increased vulnerability to online harm and misinformation arose. Particularly, individuals with insufficient digital literacy or cybersecurity knowledge were at higher risk of encountering misinformation, fraud, and computer viruses during the pandemic. This was particularly true for older adults, who also faced challenges in using digital media for social connection and were more susceptible to online scams related to COVID-19 (Moore/Hancock 2020).

All in all, this led to a reinforcement of inequalities along different axes. The reliance on digital tools for employment, social interaction, and access to essential goods and services meant that those on the "wrong side" of the digital divide experienced greater social isolation and economic hardship. Undocumented migrants, low-income individuals, and gig economy workers, for whom access to data became almost a "condition of existence" for interacting with the state and accessing welfare, appear particularly vulnerable. This also applies to digital inequalities between regions, as “data-poor”, digitally deprived regions faced additional challenges and limitations in handling the pandemic (Milan/Treré 2020).

Contributions to this Thematic Issue

Senne examines the evolution of digital inequalities in Brazil before and after the COVID-19 pandemic, with a particular focus on populations receiving social protection benefits. Digital technologies played a fundamental role during the pandemic, facilitating access to information, economic activities, public services, and social programmes. However, the thematic issue contribution highlights that limited connectivity exacerbated existing digital inequalities, with the poorer, less educated, and older segments of the population remaining largely disconnected

or unable to fully leverage online opportunities. Using sample surveys from 2005 onwards (CGI.br, 2023), the research analyses the online engagement of individuals aged 10 and older. It profiles internet users based on age, sex, and colour/race, and examines how online activities differed across groups before and after the pandemic. The study reveals that while internet access has significantly increased over time, especially through mobile devices, disparities persist in terms of how people use the internet. Results point towards a "second-level digital divide" with a "digital elite" (young, educated, higher-income individuals) engaging in more sophisticated online activities like distance learning or creating websites, while others primarily use the internet for communication (instant messaging, social media). The pandemic accelerated the adoption of financial transactions online, but growth in areas like online public services and distance learning remained below expectations, indicating structural barriers beyond just increased demand. The study also found that social protection programmes, while addressing poverty, do not necessarily close the digital inclusion gap for their beneficiaries in terms of engaging in diverse online activities.

The findings underscore the need for social policies to move beyond simply providing internet access and address the deeper issues of digital inequality. Policies should focus on targeted digital skills development to enhance digital literacy and skills among vulnerable populations, including the elderly and less educated, to enable them to engage in more complex and beneficial online activities like e-government services and online learning. Policies should identify and dismantle the structural barriers preventing wider adoption of beneficial online activities, such as financial transactions and distance learning, among lower socioeconomic groups. This could involve subsidised internet access, provision of appropriate devices, and tailored support services. Social protection programmes should actively integrate digital inclusion strategies to ensure beneficiaries can fully leverage online opportunities for education, health, and economic advancement, rather than simply using digital means for benefit distribution.

In their contribution, *Fiedler and Kerschbaumer* study how the COVID-19 pandemic amplified existing social inequalities by exposing the critical impact of the digital divide on vulnerable populations in Tyrol, Austria. The study, based on 179 interviews, specifically examines the experiences of low-income households, people with disabilities, and children, highlighting significant barriers to digital access, literacy, and participation. In this study, the Digital is treated as a dimension of inequality shaped by socio-economic background, disability and age as axes of inequality. The rapid shift to digital solutions in education, healthcare, and social services disproportionately disadvantaged these groups. Key challenges identified include limited digital literacy, inadequate devices, and unstable internet connectivity, which hindered their ability to access essential services and opportunities, thereby deepening social exclusion. For people with disabilities, inaccessible platforms and digital tools compounded their isolation and employment challenges. Children from low-income families, for instance, often lacked personal devices or reliable internet, leading to disrupted remote learning and increased mental health issues like anxiety and depression. Similarly, people with disabilities faced barriers due to inaccessible platforms and a lack of assistive technologies, further limiting their participation in tele-medicine and remote work. Additionally, the study found that bureaucratic

requirements and insufficient financial support in government initiatives rendered them largely ineffective for many low-income families needing digital equipment.

For social policy interventions, the research highlights a pressing need for coordinated efforts at policy, community, and individual levels to bridge this divide and prevent further marginalisation. Governments should prioritise universal access to affordable, user-friendly technologies and promote inclusive design to accommodate diverse user needs, especially for vulnerable populations such as children and people with disabilities. Policies should also focus on strengthening data privacy measures and integrating digital education into school curricula to prepare future generations for a technology-driven world. Community organisations are crucial in implementing these initiatives by building trust, addressing cultural barriers, and empowering individuals through digital literacy training and multilingual support. The paper emphasises that failing to address the needs of vulnerable populations risks perpetuating cycles of exclusion and inequality, hindering progress toward equitable access to digital resources and sustainable development.

Bhagat and Banerji investigate the profound transformation of work in India due to the pandemic-induced shift to remote work, with a specific focus on its gendered implications. Using online survey data, the study reveals a paradoxical reality: while remote work offered flexibility and autonomy, it significantly amplified work-life tensions, disproportionately affecting women. This is attributed to women's "dual burden" of professional and domestic responsibilities. The research highlights that men often had dedicated workspaces, whereas women frequently worked in shared or less private areas, further entrenching pre-existing gender inequalities. The study also found that despite women in the sample earning more, they were more willing to accept a pay cut for remote work, likely to manage their significant childcare and domestic duties. This underscores that the perceived flexibility of remote work often comes with hidden costs for women. Work-related factors like heavy workloads, meetings, and deadlines were identified as major sources of conflict between work and family responsibilities for both genders, though a higher percentage of women reported this conflict. Furthermore, household chores were a more significant source of conflict for women than men.

For social policy interventions, the paper emphasises the critical need for structural changes. These include gender-sensitive workplace policies being designed to acknowledge and address the unique challenges faced by women in remote work, ensuring equitable access to resources and support, and measures to foster an egalitarian distribution of unpaid and caregiving duties – this could involve promoting paternal involvement in childcare, as seen in some initiatives in India and Mexico, and non-transferable, job-protected, adequately paid, and flexible leave policies for both parents. Furthermore, digital accessibility should be improved to ensure that everyone has equal access to technology and information needed for remote work. Finally, employment protection and safety nets for vulnerable workers are necessary, vis-à-vis the significant negative impact on women's employment during the pandemic, particularly in the informal sector, policies are needed to protect women wage workers and provide safety nets.

In their contribution, *Edler and Kristal* investigate how institutional factors, specifically collective agreements and firm size, influence the relationship between computer use and earnings inequality, challenging the notion that computerisation universally leads to increased earnings inequality, arguing that coordinated wage-setting practices can moderate this effect.

In this contribution, the Digital – computer use and related digital literacy – functions as axis of inequality with regard to income. Using data from 114,759 firms and over 2 million employees across nine European countries (with a focus on Germany and the UK for collective agreements), the study finds that collective agreements generally lead to a lower average computer earnings premium. This suggests that unionisation and collective bargaining, by standardising wages and reducing managerial discretion, help distribute the benefits of computer use more equally, particularly at the lower and middle ends of the income spectrum. Similarly, larger firms tend to have a lower average computer earnings premium, and these firms also contribute to a more equal distribution of this premium, especially for lower-wage workers. This is attributed to the formalised procedures, internal labour markets, and standardised wage policies often found in larger organisations. However, the paper highlights a nuance: for high-paid employees, large firms and certain collective agreements (like "opening clauses" in Germany or performance-related pay in the UK) can increase the computer earnings premium. This suggests that while coordinated settings can mitigate inequality for most workers, highly skilled individuals can leverage their computer proficiency and positional power to secure higher earnings in more flexible compensation structures. Concluding with regard to social policy interventions, policies that strengthen collective bargaining and promote broader coverage of collective agreements could be effective in mitigating the exacerbating effect of computerisation on wage inequality for the majority of the workforce. Additionally, policies that encourage or regulate fair wage-setting practices within large corporations, potentially by emphasising internal labour markets and standardised pay structures, could also contribute to more equitable outcomes. However, policymakers must also consider that rigid coordinated settings might not equally benefit high-skilled workers, who may seek performance-based incentives. Therefore, a balanced approach is needed to ensure broad-based benefits from technological advancements while also allowing for differentiation where appropriate.

Conclusion

The digital divide was brought into the centre of attention of the social sciences and public debate during the Covid-19 pandemic, as digitalisation experienced a boost after COVID-19 measures had been introduced, largely reducing in-person social contacts. As conceptualised in this editorial, the digital divide - referring to differential access to digital equipment and the internet, but also different digital skills and usage profiles - relates to axes of inequalities such as socio-economic background, ethnicity, gender, age, disability, region or even continent. However, the Digital also constitutes an axis of inequality itself, as it shapes education, labour-market opportunities and many more life chances.

We highlighted that the digital divide functions in two ways: it is a dimension of inequality, meaning it is an outcome shaped by existing social disadvantages, and simultaneously an axis of inequality, meaning it actively structures and influences other life chances, including educational attainment, labour market opportunities, and overall well-being. Therefore, unequal digital access and literacy can lead to disadvantages in various aspects of life, perpetuating cycles of exclusion.

The contributions within this thematic issue, including the studies by Senne, Fiedler/Kerschbaumer, Bhagat/Banerji, and Edler/Kristal, empirically demonstrate these multifaceted impacts. Senne's contribution shows how the pandemic increased digital inequalities in Brazil with socio-economically deprived people, older-age people and people of colour being particularly vulnerable. Beside the provision of access, motivation for beneficial use of the internet seems to be key. Fiedler's and Kerschbaumer's work in Tyrol, Austria, showed how the pandemic exacerbated digital disparities for low-income households, people with disabilities, and children, leading to hindered access to essential services and increased social exclusion. Bhagat's and Banerji's research on India revealed the gendered impact of remote work, with women disproportionately affected by increased work-life tensions due to their "dual burden" of professional and domestic responsibilities, often accepting pay cuts for flexibility. Edler's and Kristal's study across European countries indicated that while collective agreements and larger firm sizes can moderate the effect of computerisation on earnings inequality for most workers, highly skilled individuals may still leverage their digital proficiency for higher earnings in more flexible compensation structures.

Addressing the digital divide requires comprehensive and coordinated social policy interventions across multiple levels: ensuring material access, fostering digital skills, promoting beneficial usage, and creating supportive institutional and systemic environments. Failing to address these disparities risks perpetuating and deepening existing inequalities, hindering progress towards an inclusive and equitable digital society. A multi-faceted policy approach is essential to prevent further marginalisation and ensure equitable participation in an increasingly digital world.

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