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Review Article

Levels of digital divide: A Review Literature

Kajal Shaw
Doctoral Research Scholar, Department of Mass Communication and Media Studies,
Central University of Punjab, India

Corresponding Author: * Kajal Shaw

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ABSTRACT

The digital divide remains a critical issue in today's rapidly evolving digital economy, reflecting inequalities not only in access to technology but also in skills and outcomes. This paper reviews the multilayered nature of the digital divide, highlighting three levels: access, usage, and benefits derived from digital engagement. The COVID-19 pandemic intensified these disparities, emphasizing their social and economic consequences. While early studies focused primarily on connectivity, contemporary research stresses the importance of digital skills and the ability to translate technology use into tangible benefits. By synthesizing recent literature, this review offers insights for developing more inclusive digital policies that address all dimensions of digital inequality, supporting equitable participation in an increasingly digital society.

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INTRODUCTION

The digital economy is reshaping societies worldwide, influencing how people communicate, work, learn, and access essential services. Despite the widespread diffusion of digital technologies, significant disparities persist in how individuals and communities engage with these tools, giving rise to what is known as the digital divide (Raihan et al., 2025). Originally framed as a gap in access to computers and the Internet, the digital divide (Han and Kumwenda, 2025) has evolved into a complex, multilayered issue encompassing not only access but also digital skills, usage patterns, and the ability to derive meaningful benefits from technology (Lybech et al, 2024). This expanded understanding recognizes that simply having Internet access does not guarantee equitable participation in digital society or its benefits. Moreover, the COVID-19 pandemic has underscored and intensified these inequalities by forcing millions to rely heavily on digital technologies for remote work, online education, healthcare, and social connection (Ruiu and Ragnedda, 2024). Those lacking adequate access, skills, or digital literacy have faced increased marginalization and exclusion (Bansal and Choudhary, 2024). Addressing the digital divide thus requires a nuanced approach that considers the

diverse dimensions of digital engagement and their intersections with social, economic, and geographic factors.
While research has documented these layers of the divide, many studies focus narrowly on specific aspects or populations, limiting the broader understanding of digital inequality. This review aims to synthesize recent academic perspectives on the levels of the digital divide and explore emerging or overlooked dimensions, offering a comprehensive framework to inform inclusive digital policies that promote social equity and sustainable development.

METHODOLOGY

This study employs a systematic literature review methodology to synthesize key academic perspectives on the digital divide's multidimensional nature. Drawing upon seminal and contemporary works, this review paper focuses on conceptual frameworks defining the three levels of the digital divide: access, usage, and outcomes. Scholarly articles, reports, and theoretical analyses published between 1999 and 2021 were selected from databases such as JSTOR, Google Scholar, and institutional repositories, prioritizing sources central to digital divide discourse. The methodology involved thematic coding to identify evolving definitions, dimensions, and gaps in the literature. This approach enables a comprehensive understanding of the digital divide's complexity and supports the identification of emerging themes relevant to current digital inclusion policies.

Defining digital divide

At the beginning of research into the digital divide, the definition of the digital divide was broad and the term was loosely used to express either the disparity between people in their access to ICTs or more specifically, the disparity in their access to the Internet. From the end of the 1990s onwards, attempt to accurately define the digital divide are frequently seen (Srinuan and Bohlin, 2011). Van Dijk (2002) pointed out that the divide should be defined in terms both of access and of the use of ICT. Norris (2003) noted that digital divide can exist in a particular country and also between countries. NTIA (1999) define the digital divide as the divide between thosewith access to ICTs and those without. The discussion of the digital divide initially employed an element of technological determinism. According to Norris (2003) the gaps in access could also be understood as a phenomenon with
three distinct aspects, including a global divide (referring to ICT disparities between countries), a social divide (referring to the gap in access to ICT between different sections of a nation's society) and a democratic divide (referring to the difference between those who do and those who do not use the variety of digital means to engage in public life)

Levels of digital divide

First Level

The term *digital divide* first gained prominence in policy-making circles before it began receiving substantial academic attention across a wide range of disciplines. Scholarly discussions on the digital divide began to emerge in the early 1990s. At that time, the concept was largely perceived as a binary division between individuals who had access to computers and the Internet and those who did not (Hoffman et al., 2000). This access gap, later known as the first-level digital divide, became a central focus of early studies. In the early 2000s, the concept began to broaden as scholars argued that the digital divide should be understood through multiple dimensions, not merely through the dichotomy of the "haves" and "have-nots" (Leavitt, 2002). This led to the development of more nuanced perspectives that considered factors such as access to relevant content, the quality of Internet connections, and the skills and knowledge of users (DiMaggio et al., 2004; Van Dijk & Hacker, 2003).

Second Level

This conceptual shift, which focused on variations in digital skills and patterns of use, came to be known as the second-level digital divide (Van Dijk, 2005). This stage also introduced the concept of digital inequality—emphasizing disparities in users' capabilities to effectively engage with digital technologies (Hargittai, 2002). Scholars such as DiMaggio et al. (2004) identified that the second-level divide includes inequalities in technical means, autonomy of use, usage patterns, and skills. Van Dijk and Hacker (2003) and Van Dijk (2006) also introduced the idea of mental access, which pertains to motivational access—psychological barriers such as low self-efficacy or computer anxiety that inhibit technology adoption. As the concept continued to evolve, researchers began questioning the assumption that access and use of digital technologies automatically lead to benefits. In this light, a third conceptual layer emerged—one that focuses on the outcomes of Internet use. Scholars (e.g., Selwyn, 2004; Van Dijk, 2005) argued that the inequality in the ability to translate digital use into tangible benefits represents another level of divide.

Third Level

This third-level digital divide was formally conceptualized by Wei et al. (2011) and describes the gap that exists even after equal access and use, where some individuals are better able to leverage digital technologies for personal or professional advancement (Van Deursen et al., 2016). As Ragnedda (2017) noted, disparities in the capacity to exploit ICT can significantly affect the distribution of benefits. Thus, the digital divide has transitioned from a singular concept of access to a dynamic, multidimensional framework encompassing ICT access, usage, and outcomes (Shakina et al., 2021). It is now widely acknowledged as a fluid phenomenon influenced by a range of social, technical, and psychological factors (Bruno et al., 2011). The rapid expansion of mobile Internet in the 2000s led some scholars to suggest that the digital divide was shrinking (Stump et al., 2008). However, it is critical to note that the divide continues to persist across all three established levels, albeit in evolving forms (Kolb et al., 2020). As technological advances accelerate and future-oriented perspectives are developed, new

ways of understanding digital inequality are becoming increasingly relevant.

CONCLUSION

The digital divide is a dynamic and multidimensional challenge that extends far beyond mere technological access. Addressing it requires a holistic understanding of its three levels—access, usage, and outcomes—to tackle the underlying social and economic inequalities effectively. The COVID-19 pandemic has revealed the critical consequences of digital exclusion, reinforcing the need for inclusive policies that enhance digital skills and equitable benefits. This review highlights the importance of integrating these dimensions into digital strategies to foster greater social participation and reduce inequality. Future research and policy should continue to evolve in response to technological advancements and emerging forms of digital disparity.

CONFLICTS OF INTEREST: Nil

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