SOCIAL INEQUALITY AND DIGITAL EXCLUSION IN BRAZIL: INTERFACES BETWEEN ACCESS, TECHNOLOGICAL LITERACY, AND SOCIAL PARTICIPATION

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Abstract

Digital transformation has intensified dependence on Information and Communication Technologies (ICTs) across different dimensions of social life, making access to technology a fundamental element for social inclusion and citizenship. In this context, the present study aimed to analyze the interfaces between social inequality and digital exclusion in Brazil, considering aspects related to access to technologies, technological literacy, and social participation. This is an integrative literature review with a qualitative, exploratory, and descriptive approach, conducted between April and May 2026. The search for studies was carried out in the databases Periódicos CAPES, SciELO, ScienceDirect, SpringerLink, Taylor & Francis Online, SAGE Journals, and Wiley Online Library, resulting in the final selection of 17 scientific articles published between 2021 and 2025. The findings revealed that digital exclusion is directly associated with socioeconomic, educational, and territorial inequalities, mainly affecting vulnerable populations, rural residents, and individuals with low educational levels. The study also demonstrated that access to technologies alone does not guarantee social inclusion, making the development of digital skills essential for the critical and autonomous use of technological resources. It is concluded that digital inclusion should be understood as a multidimensional process, dependent on the articulation between technological infrastructure, democratization of internet access, digital literacy, and inclusive public policies aimed at reducing social inequalities and strengthening digital citizenship.

Keywords: Digital citizenship, Social vulnerability, Information technologies, Digital literacy, Technological equity.

INTRODUCTION

Contemporary society is experiencing an intense process of digital transformation, in which Information and Communication Technologies (ICTs) have come to exert a direct influence on different dimensions of social life. Access to the internet and to technological resources has become indispensable for activities related to education, work, communication, access to public services, health, and citizen

participation. In this context, being connected has ceased to represent merely a technological convenience and has become an important factor for social inclusion, human development, and the exercise of citizenship (Asimakopoulos et al., 2025).

Despite the technological advances observed in recent decades, access to digital tools still occurs unequally, especially in countries marked by profound social and economic disparities, such as Brazil. Social inequality and digital exclusion have a directly interconnected relationship, since individuals in situations of economic vulnerability frequently face greater difficulties in accessing digital technologies. This exclusion is not limited only to the absence of internet or electronic devices, but also involves limitations related to connection quality, continuous access to digital platforms, and the lack of technological literacy necessary for the critical and efficient use of these tools (Heeks, 2022).

In Brazil, the expansion of the internet has occurred unevenly across regions and social groups, following the country's own historical structures of inequality. Factors such as income, educational level, age group, and geographic location directly influence the way individuals access and use digital resources. Alves (2021) emphasizes that Brazilian digitalization occurred in parallel with the strengthening of socio-digital inequalities, showing that internet access remains conditioned by the socioeconomic conditions of the population. Thus, low-income populations, residents of rural areas, and socially vulnerable groups face greater difficulties in achieving full insertion into digital society.

In addition to structural limitations of access, digital exclusion is also related to difficulties in developing digital competencies. In an increasingly connected society, having internet access does not necessarily guarantee social inclusion and effective participation in digital environments. It becomes essential to understand, interpret, and use technologies in a critical, safe, and autonomous manner. Méndez-Domínguez et al. (2023) state that digital inclusion should be understood as a broad process, involving both access to technologies and the strengthening of digital literacy and the skills necessary for social participation. In this sense, the absence of these competencies expands already existing inequalities and limits access to educational, professional, and informational opportunities.

The problem of digital exclusion became even more evident during the COVID-19 pandemic, a period in which educational activities, public services, and health care began to depend intensely on digital technologies. Nakayama et al. (2023) point out that inequality in internet access significantly compromised the Brazilian population's access to telemedicine and digital health services, revealing barriers related both to technological infrastructure and to socioeconomic conditions. Similarly, Santos et al. (2021) demonstrate that young people in situations of social vulnerability face difficulties related to digital literacy, a factor that directly interferes with their possibilities for educational inclusion and social integration.

Another relevant aspect concerns the relationship between digital exclusion and citizen participation. Digital technologies have expanded the possibilities for communication, social interaction, and democratic participation, allowing greater proximity between citizens and public institutions. However, the persistence of digital inequalities prevents a large portion of the population from fully participating in these spaces. Dodel (2023) emphasizes that inequalities related to access to and use of technological devices directly influence the population's engagement with digital government services, compromising the realization of digital citizenship. Thus, digital exclusion comes to represent not only a technological problem, but also a social and democratic issue.

Furthermore, the digital transformation of public services requires inclusive policies capable of guaranteeing accessibility and technological equity for marginalized populations. Djatmiko, Sinaga, and Pawirosumarto (2025) highlight that digital inclusion depends on the articulation between technological infrastructure, digital education, and public policies aimed at social inclusion. Therefore, reducing digital inequalities requires investments not only in connectivity, but also in the promotion of educational actions and strategies that favor the development of technological competencies and the strengthening of social participation.

In view of this context, this study aims to analyze the interfaces between social inequality and digital exclusion in Brazil, discussing how access to technologies, technological literacy, and social

participation are related in contemporary society. It seeks to understand the main challenges faced by socially vulnerable groups in accessing digital resources, as well as to reflect on the importance of public policies and educational strategies aimed at digital inclusion, the democratization of access to information, and the reduction of social inequalities.

METHODOLOGY

This is an integrative literature review with a qualitative approach, exploratory and descriptive in nature, conducted between April and May 2026, whose objective was to analyze the interfaces between social inequality and digital exclusion in Brazil, considering aspects related to access to technologies, technological literacy, and social participation in contemporary society.

The methodological pathway was developed based on the methodological assumptions of Gil (2019), encompassing the stages of defining the research problem, establishing inclusion and exclusion criteria, searching for and selecting studies, critically analyzing the selected material, organizing information, and synthesizing the results.

The guiding question of the review was defined as follows: how does social inequality interfere with access to digital technologies, the development of technological literacy, and the social participation of the Brazilian population?

The search for studies was carried out in the databases Periódicos CAPES, Scientific Electronic Library Online (SciELO), ScienceDirect, SpringerLink, Taylor & Francis Online, SAGE Journals, and Wiley Online Library, as well as in national and international scientific journals related to the areas of social inequality, digital inclusion, information technologies, and social participation.

For the search strategy, descriptors and free terms related to the theme were used, such as: (social inequality), (digital exclusion), (digital inclusion), (technological literacy), (digital citizenship), (social participation), (digital technologies), and (internet access), combined using the Boolean operators AND and OR.

The inclusion criteria adopted were: full-text scientific articles published between 2021 and 2025, in Portuguese, English, or Spanish, that addressed the relationship between social inequality, access to digital technologies, technological literacy, and social participation. As exclusion criteria, duplicate studies, simple abstracts, narrative reviews, editorials, dissertations, theses, and publications that did not directly respond to the guiding research question were considered.

The initial search identified 268 studies. After applying the time frame and verifying full-text availability, 62 studies were excluded due to unavailability or because they did not meet the inclusion criteria. Subsequently, 38 duplicate studies were removed, leaving 168 studies for title and abstract analysis. At this stage, 110 studies were excluded because they did not directly address the proposed theme, resulting in 58 studies eligible for full reading.

After complete reading and application of the eligibility criteria, 41 studies were excluded because they did not consistently address the relationship between social inequality, digital exclusion, technological literacy, and social participation, or because they presented methodological limitations. Thus, 17 scientific articles were selected to compose the final sample.

Data analysis was performed through thematic content analysis, according to Bardin (2011), encompassing the stages of pre-analysis, exploration of the material, thematic categorization, and interpretation of the results.

RESULTS AND DISCUSSION

The results of the integrative review were systematized and organized in Table 1, considering the numbering of studies, publication journal, authors, year, title of the works, and their main contributions to understanding the interfaces between social inequality, digital exclusion, technological literacy, and social participation.

Table 1

Selected papers on social inequality and digital exclusion

No.	Journal	Author(s)	Year	Title of the paper	Main contributions
1	Revista Pós Ciências Sociais	Alves, E. P. M.	2021	*A expansão da internet no Brasil: digitalização, mercado e desigualdades sociodigitais* [The expansion of the internet in Brazil: digitalization, market, and socio-digital inequalities]	Highlights the unequal expansion of the internet and its relations with social inequalities in Brazil.
2	Technology in Society	Anrijs, S. *et al.*	2023	Excluded from essential internet services	Analyzes the relationship between digital exclusion and socioeconomic resources.
3	Societies	Asimakopoulos, G. *et al.*	2025	Impact of ICTs on democratic processes and citizen participation	Discusses the role of ICTs in citizen participation and democratic processes.
4	Journal of Policy and Practice in Intellectual Disabilities	Chadwick, D. *et al.*	2022	Digital inclusion and participation during COVID-19	Addresses the digital inclusion of people with intellectual disabilities during the pandemic.
5	Sustainability	Djatmiko, G. H.; Sinaga, O.; Pawirosumarto, S.	2025	Digital transformation and social inclusion in public services	Analyzes digital inclusion in public services for marginalized populations.
6	Social Science Computer Review	Dodel, M.	2023	Why device-related digital inequalities matter	Shows how device inequalities affect the use of e-government.
7	Information Technology for Development	Heeks, R.	2022	Digital inequality beyond the digital divide	Expands the concept of digital exclusion beyond access.
8	Frontiers in Communication	Méndez-Domínguez, P. *et al.*	2023	Digital inclusion for social inclusion	Highlights the role of digital literacy in social inclusion.
9	Journal of Information Science	Muñoz, J. A. H.; Valencia, D. C.	2023	Trends and challenges of digital divide	Presents a bibliometric analysis of digital exclusion.

10	Journal of Medical Internet Research	Nakayama, L. F. *et al.*	2023	The digital divide in Brazil and telehealth barriers	Highlights inequalities in access to digital health care in Brazil.
11	GSC Advanced Research and Reviews	Nirmani, I. A. P.	2025	Barriers to digital participation in developing countries	Identifies technological, social, and cultural barriers to digital inclusion.
12	Education and Information Technologies	Nogueira, V. B. *et al.*	2022	Inclusive digital literacy in rural Brazil	Demonstrates the impact of digital literacy interventions.
13	Sinergi International Journal of Communication Sciences	Saleh, M.; Irwani; Bahrianoor	2024	Digital exclusion and social inequity	Relates digital exclusion to global social inequalities.
14	Research, Society and Development	Santos, A. S. *et al.*	2021	Digital inclusion and youth vulnerability	Analyzes digital literacy among young people in social vulnerability.
15	Teias de Conhecimento	Stadler, M. S.; Krepel, J. A.; Manjinski, E.	2025	*Tecnologia para todos* [Technology for all]	Presents digital inclusion strategies in education.
16	International Journal of Research and Innovation in Social Science (IJRISS)	Tomaz, M. L.; Silva, C.	2025	Digital exclusion and lifelong learning	Relates digital exclusion to lifelong learning.
17	Social Indicators Research	Zárate, Z. E.; Trujillo, C. C.; Plaza-De-La-Hoz, J.	2023	Digitalization in vulnerable populations	Review on digitalization among vulnerable populations in Latin America.

Source: Authors (2026).

The analysis of the studies made it possible to organize the findings into three thematic axes, constructed from the recurrence of meanings and patterns identified in the literature, according to the content analysis technique proposed by Bardin (2016).

ACCESS AND STRUCTURAL INEQUALITY

Inequality in access to digital technologies constitutes one of the main determinants of digital exclusion. In the Brazilian context, the expansion of the internet occurs unevenly, strongly conditioned by

socioeconomic factors and market logic, which reinforces already existing historical disparities (Alves, 2021).

This reality intensifies when it is observed that access to technologies is directly related to income, educational level, and material living conditions, showing that digital exclusion is not only technological but also social (Anrijs et al., 2023). In contexts such as Brazil, such inequalities even compromise the effectiveness of digitalized public policies, especially in areas such as health and essential services (Nakayama et al., 2023).

In developing countries, structural barriers include high connectivity costs, precarious infrastructure, and instability of basic services, factors that limit the universalization of digital access (Nirmani, 2025). These elements demonstrate that digital exclusion is directly linked to socioeconomic inequality.

In Latin America, vulnerable populations are the most affected by this process, indicating that digitalization tends to reproduce and expand already existing social inequalities (Zárate et al., 2023).

LITERACY AND DIGITAL COMPETENCIES

The studies analyzed indicate that access to technologies alone does not guarantee digital inclusion, making the development of digital competencies necessary for the critical and functional use of technological tools.

Educational interventions aimed at digital literacy demonstrate positive impacts on individuals' autonomy, especially in contexts of social vulnerability, expanding possibilities for social and educational participation (Nogueira et al., 2022). In this sense, digital inclusion should be understood as an ongoing formative process.

Digital literacy appears as a central element for social inclusion, since it enables individuals to understand, interpret, and use technologies critically (Méndez-Domínguez et al., 2023). In the educational

environment, pedagogical strategies aimed at digital inclusion have proven fundamental for reducing inequalities and promoting equity in access to knowledge (Stadler; Krepel; Manjinski, 2025).

However, even in contexts with access to technology, more subtle forms of exclusion may occur, in which individuals are unable to use digital resources productively, configuring what Heeks (2022) calls adverse digital incorporation. Thus, digital exclusion goes beyond the dimension of access and reaches the dimension of qualified use.

SOCIAL PARTICIPATION AND DIGITAL CITIZENSHIP

Digital exclusion directly impacts social participation and the exercise of citizenship, since a large portion of public services, educational processes, and democratic interactions are increasingly mediated by digital technologies.

The appropriate use of information and communication technologies can strengthen citizen participation and expand democratic processes, provided that adequate access and competencies exist (Asimakopoulos et al., 2025). However, inequalities related to devices and connectivity still limit engagement with digital services, creating new forms of exclusion in the virtual environment (Dodel, 2023).

Groups in situations of vulnerability, such as people with intellectual disabilities, face additional barriers to access and participation, especially in crisis contexts, as evidenced during the COVID-19 pandemic (Chadwick et al., 2022). This demonstrates that digital exclusion also has an intersectional dimension.

The digital transformation of public services can function as an instrument of social inclusion, provided that it is accompanied by public policies that guarantee accessibility and equity (Djatmiko; Sinaga; Pawirosumarto, 2025). However, the absence of digital competencies limits lifelong learning and reduces educational and professional opportunities (Tomaz; Silva, 2025).

Broadly speaking, digital exclusion is directly associated with global social inequalities, affecting access to education, health, and economic participation, which reinforces its structural and multidimensional character (Saleh; Irwani; Bahrianoor, 2024).

CONCLUSION

It is evident that social inequality and digital exclusion have a directly interconnected relationship in the Brazilian context, since access to digital technologies remains deeply conditioned by socioeconomic, educational, and territorial factors. In this sense, the present study achieved its proposed objective of analyzing the interfaces between social inequality and digital exclusion in Brazil, discussing how access to technologies, technological literacy, and social participation are related in contemporary society.

Furthermore, it made it possible to understand that digital exclusion goes beyond the absence of connectivity, also involving limitations related to the quality of access, availability of technological devices, development of digital competencies, and social participation in environments mediated by technologies.

The studies analyzed demonstrated that populations in situations of social vulnerability, residents of rural areas, individuals with low levels of education, and historically marginalized groups face greater difficulties in achieving full insertion into digital society. In this context, digital inequality contributes to the expansion of already existing social inequalities, compromising access to education, public services, health care, information, and professional opportunities.

It was found that technological literacy plays a fundamental role in strengthening social inclusion and digital citizenship, since mere access to technologies does not guarantee effective participation and critical use of digital tools. The literature showed that educational actions aimed at developing digital competencies contribute significantly to individuals' autonomy, the expansion of social participation, and the reduction of exclusion barriers.

Among the main gaps identified, the following stand out: the insufficiency of public policies aimed at universalizing access to quality internet; the persistence of regional inequalities in connectivity; the limitation of digital literacy programs for vulnerable populations; and the absence of continuous strategies for technological inclusion in schools, peripheral communities, and rural areas. Weaknesses related to digital accessibility for specific groups, such as older adults, people with disabilities, and individuals in situations of social vulnerability, were also observed, revealing limitations in the realization of digital citizenship and in equitable access to digitalized public services.

Another relevant aspect identified concerns the need for inclusive public policies that articulate technological infrastructure, democratization of internet access, and promotion of digital literacy, especially for socially vulnerable populations. Thus, digital inclusion must be understood as a multidimensional process, directly related to social equity, the strengthening of citizenship, and the guarantee of rights in contemporary society.

As a contribution, this study expands discussions on the relationships between social inequality and digital exclusion in the Brazilian context, highlighting the importance of educational strategies and public policies aimed at technological inclusion and social participation. For future research, the development of empirical studies is suggested to evaluate the effectiveness of public policies for digital inclusion in different regions of Brazil, as well as investigations into the impacts of digital exclusion on specific populations, such as public education students, older adults, rural communities, and socially vulnerable groups. It is also recommended that research be conducted on the relationship between artificial intelligence, digital transformation, and the expansion of social inequalities, considering contemporary challenges related to digital citizenship, technological accessibility, and the democratization of knowledge.

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