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Digital Inequality and Social Stratification in Contemporary Societies: A Hybrid Systematic Literature Review and Bibliometric Analysis

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ABSTRACT

This study integrates a Systematic Literature Review (SLR) and bibliometric analysis to examine global research on digital inequality within the broader context of social stratification. Data were retrieved from the Scopus database on 14 February 2026, initially identifying 408 publications between 2001 and 2026. Following a rigorous screening process based on the PRISMA 2020 guidelines, 225 peer-reviewed journal articles were selected for final analysis. Bibliometric mapping and visualization were conducted using VOSviewer to identify publication trends, thematic clusters, and intellectual structures. The findings indicate substantial growth in scholarship over time, with research heavily concentrated in Western nations, particularly the United States and the United Kingdom. The dominant thematic domains include digital access and skills, social and economic inequality, educational stratification, and digital inclusion. Collectively, these themes demonstrate that digital inequality is a multidimensional, structural condition that actively reproduces unequal life chances across social groups rather than a mere technological gap. Based on these insights, this study proposes an integrative conceptual model structured across input (socio-structural conditions and digital resources), process (differentiated digital engagement), and output (stratified social, economic, and civic outcomes) dimensions. This framework extends existing literature by positioning digital exclusion as a core mechanism of contemporary social reproduction. Overall, this study provides a comprehensive mapping of global publication patterns and intellectual directions in the field. The findings highlight the need for future research to expand data sources beyond a single database and incorporate diverse regional, non-Western contexts to foster a more inclusive and globally representative understanding of digital stratification.

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1. Introduction

Digital inequality has attracted increasing scholarly attention as a critical issue in understanding social stratification in contemporary societies (Halford & Savage, 2010; Mansell, 2017; Zilian & Zilian, 2020). Beyond questions of technological access, digital inequality is closely connected to broader social challenges such as unequal educational opportunities, labor market disparities, and uneven economic development. At its core, digital inequality highlights how disparities in access to digital resources, skills, and effective use shape life chances and reproduce existing social hierarchies. These dynamics position digital inequality not merely as a technological concern, but as a structural social problem with significant implications for inequality and stratification processes (Hilbert, 2015; Martini & Sgambato, 2025; Ragnedda & Muschert, 2015).

Over time, different analytical approaches to digital inequality have emerged. Early studies emphasized disparities in access to digital technologies, while later research expanded this focus to include inequalities in digital skills, usage patterns, and the ability to translate digital engagement into social and economic advantages (Hilbert, 2015; van Deursen et al., 2017). Despite their conceptual differences, these approaches consistently demonstrate that digital inequality is shaped by socio-economic conditions such as income, education, gender, and geographic location. Rather than automatically reducing inequality, digital transformation often mirrors and intensifies existing social divisions, reinforcing patterns of advantage and disadvantage across social groups (Mansell, 2017; Martini & Sgambato, 2025; Viluckienė, 2015; Zilian & Zilian, 2020).

The study of digital inequality has continued to develop through interdisciplinary engagement across sociology, economics, education, and policy research. Existing scholarship has increasingly examined the implications of digital inequality for economic development, social justice, educational access, and civic participation (Büchi & Hargittai, 2022; González-Betancor et al., 2021; Liu et al., 2017). Recent studies also emphasize that digital inequality affects not only economic outcomes, but also access to education, public services, and opportunities for social participation (Engzell et al., 2021; Rosenberg, 2020; Vitral Rezende, 2023). However, despite growing academic attention, existing research remains fragmented and lacks a comprehensive analytical framework capable of systematically mapping publication trends, dominant themes, and conceptual developments within the intersection of digital inequality and social stratification research (Halford & Savage, 2010; Hilbert, 2015; Martini & Sgambato, 2025).

Although previous studies have examined digital inequality through either systematic literature reviews or bibliometric approaches, most of these studies tend to focus on specific dimensions such as digital access, digital skills, educational inequality, or technological adoption. Existing review-based studies also remain limited in integrating the broader perspective of social stratification with the evolving intellectual structure of digital inequality research. Furthermore, only a limited number of studies have combined Systematic Literature Review (SLR) and bibliometric analysis within a hybrid framework to comprehensively map publication trends, thematic developments, conceptual relationships, and future research directions in this field.

Addressing these limitations, the present study adopts a hybrid methodological approach by integrating SLR and bibliometric analysis to provide a more comprehensive understanding of the relationship between digital inequality and social stratification. This study not only synthesizes existing findings, but also maps the intellectual structure, dominant themes, collaborative networks, and emerging research directions within the global literature.

Based on this objective, the study is guided by the following research questions:

RQ 1*: What are the publication trends and intellectual structures of research on digital inequality and social stratification?*

RQ 2*: Which thematic and contextual domains dominate this field?*

***RQ 3**: What future research directions can contribute to a more integrated understanding of digital inequality in contemporary societies?*

To answer these questions, this study integrates SLR and bibliometric analysis as complementary methods. The SLR synthesizes and critically interprets previous studies, allowing for a structured understanding of existing knowledge and research gaps. Meanwhile, bibliometric analysis reveals publication patterns, thematic clusters, and collaborative networks within the literature using the Scopus database and visualization tools from VOSviewer, covering publications up to 14 February 2026.

To address these questions, this study integrates SLR and bibliometric analysis as complementary methods. The SLR enables a systematic synthesis and critical interpretation of existing studies, while bibliometric analysis reveals publication patterns, thematic clusters, and collaborative networks within the literature using the Scopus database and visualization tools such as VOSviewer, covering publications up to 14 Februari 2026.

2. Literature review

Digital inequality examines the unequal distribution of access to digital technologies, digital skills, and meaningful patterns of use across different social groups, and seeks to clarify how these disparities shape social stratification in contemporary societies. Scholars argue that digital inequality provides an analytical framework for understanding how technological transformation intersects with existing structures of class, education, and power, thereby influencing life chances and social mobility (Halford & Savage, 2010; Hilbert, 2015; Mansell, 2017; Zilian & Zilian, 2020). Initially, research in this field focused primarily on the "digital divide," emphasizing disparities in internet access and device ownership as key indicators of inequality.

Early studies stressed that digital inequality should not be understood merely as a technological or infrastructural deficit, but as a socially embedded phenomenon rooted in broader socio-economic structures. Researchers demonstrated that income, education, geographic location, and age significantly influence digital access and digital competence, indicating that digital exclusion reflects pre-existing inequalities rather than individual preferences alone (Hilbert, 2015; van Deursen et al., 2017; Viluckienė, 2015). Consequently, digital inequality came to be viewed as an extension of traditional forms of stratification, challenging the optimistic assumption that digital technologies would automatically democratize opportunities and promote social inclusion (Mansell, 2017; Ragnedda & Muschert, 2015).

Building on these foundations, scholars increasingly linked digital inequality to issues of economic development and income distribution. From an economic-sociological perspective, the digital economy does not affect inequality uniformly. In certain contexts, digital platforms and online labor markets may expand access to economic opportunities, yet unequal access to digital infrastructure and uneven investment in technological development frequently intensify existing income gaps (DiMaggio & Bonikowski, 2008; Liu et al., 2017a; Martini & Sgambato, 2025). Empirical evidence further shows that digital inequality is associated with regional economic disparities, particularly in rapidly developing economies where technologically advanced regions benefit disproportionately compared to less connected areas (Liu et al., 2017a; Tian, 2025; Zhao & Kuang, 2025). These patterns underscore that digital inequality functions not merely as a technological issue, but as a structural economic condition that reproduces uneven development and reinforces stratified labor markets (Zilian & Zilian, 2020).

Closely related to economic inequality is the discourse on social justice, which positions digital access as a prerequisite for equitable participation in modern society. Scholars emphasize that unequal digital resources deepen educational disparities, particularly in rural and marginalized communities, where limited infrastructure intersects with broader socio-economic disadvantage (Engzell et al., 2021; González-Betancor et al., 2021; Sanrey et al., 2021). During periods of crisis such as the COVID-19 pandemic, these inequalities became even more visible, as remote learning and digital service delivery amplified pre-existing gaps (Reynolds et al., 2022; Vitral Rezende, 2023). Beyond education, digital inclusion enhances access to public services, employment opportunities, and civic engagement,

while digital exclusion constrains individuals' ability to exercise social and economic rights fully (Büchi & Hargittai, 2022; McPherson & Wilkinson, 2001; Rosenberg, 2020). In this sense, digital inequality is increasingly framed as a justice issue in which technological disparities translate into unequal citizenship and participation (Martini & Sgambato, 2025; Zilian & Zilian, 2020).

Another significant development in this field is the recognition that digital inequality encompasses more than access; it includes disparities in digital skills, usage patterns, and the capacity to convert digital resources into tangible social and economic benefits. Empirical studies demonstrate that individuals from higher socio-economic backgrounds tend to possess stronger digital competencies and more advantageous patterns of digital engagement, while gender, age, and rural–urban divides continue to structure digital participation (Martini & Sgambato, 2025; van Deursen et al., 2017; Willekens et al., 2022). This multidimensional understanding highlights how digital technologies interact with existing forms of economic, cultural, and social capital, reinforcing established hierarchies rather than dismantling them (Lissitsa, 2015; Merisalo & Makkonen, 2022; Ragnedda & Muschert, 2015).

From a broader sociological perspective, digital inequality challenges technological determinism by emphasizing that digital transformation is embedded within power relations and institutional contexts. Rather than inherently reducing inequality, digital technologies may reproduce and intensify stratification when structural barriers remain intact (Halford & Savage, 2010; Mansell, 2017). Marginalized groups defined by socio-economic status, gender, age, or geography often experience compounded disadvantages, as limited digital access and skills constrain economic opportunities, social participation, and cultural expression(Hilbert, 2015; Martini & Sgambato, 2025; Zilian & Zilian, 2020). Digital inequality thus emerges as a multidimensional mechanism through which contemporary societies reproduce and reshape social hierarchies under conditions of rapid technological change.

Taken together, these perspectives position digital inequality not as a peripheral technological concern, but as a central analytical lens for understanding social stratification in the digital age. It operates simultaneously as an economic constraint, a social justice issue, and a structural dimension of inequality, shaping the distribution of resources, opportunities, and life chances in contemporary societies (Halford & Savage, 2010; Hilbert, 2015; Martini & Sgambato, 2025).

Table 1: Key Conceptual Foundations of Digital Inequality and Social Stratification

Conceptual Category	Core Defining Elements of Digital Inequality and Social Stratification	Representative Sources
Economic Aspects	1. Shapes unequal income distribution and regional economic development. 2. Access to platforms creates uneven employment and digital resource distribution. 3. Digital disparities reinforce regional, spatial, and urban-rural economic gaps. 4. Functions as a structural economic condition that reproduces uneven capitalist development.	(DiMaggio & Bonikowski, 2008; Liu et al., 2017a; López-Sintas et al., 2020; Martini & Sgambato, 2025; Tian, 2025; Zhao & Kuang, 2025)
Social Justice	1. Directly impacts and shapes unequal life chances and social rights. 2. Deepens educational inequalities, especially during crises (e.g., remote learning in COVID-19). 3. Restricts digital inclusion, healthcare information, public services, and civic participation. 4. Compounds existing disadvantages for vulnerable groups (disabled, elderly, low-income).	(Büchi & Hargittai, 2022; Cho & Kim, 2021; Engzell et al., 2021; González-Betancor et al., 2021; Hartmann et al., 2025; Martini & Sgambato, 2025; McPherson & Wilkinson, 2001; Reynolds et al., 2022; Rosenberg, 2020; Sanrey

	5. Positions digital inclusion as a normative concern rather than a mere technical goal.	et al., 2021; Vitral Rezende, 2023; Zilian & Zilian, 2020)
Digital Divide	1. Operates as a critical and multidimensional mechanism of social stratification. 2. Extends beyond material access to differences in digital skills and usage patterns. 3. Conditioned systematically by socio-economic status, education, age, gender, and geography. 4. Intersects with Bourdieusian capitals (economic, cultural, social) to reproduce hierarchies. 5. Refined as an active agent that mirrors, shapes, and intensifies established social divisions.	(Halford & Savage, 2010; Hilbert, 2015; Lissitsa, 2015; Mansell, 2017; Martini & Sgambato, 2025; Merisalo & Makkonen, 2022; Ragnedda & Muschert, 2015; van Deursen et al., 2017; Viluckienė, 2015; Willekens et al., 2022; Zilian & Zilian, 2020)

2.1 Critical Synthesis

This study employed a hybrid methodological approach that integrates a Systematic Literature Review (SLR) with bibliometric analysis to examine global research trends on digital inequality and social stratification. Clear inclusion criteria were applied to ensure the relevance and reliability of the data. Only peer-reviewed journal articles in English that addressed issues of digital inequality, digital divide, or digital stratification in relation to social inequality or social stratification were included. Although the literature on digital inequality has expanded rapidly and encompasses diverse disciplinary perspectives, several recurring patterns and tensions can be identified across the field.

Across economic, social justice, and stratification-oriented studies, scholars consistently emphasize that digital inequality is deeply embedded within existing socio-economic structures. Research highlights common concerns regarding unequal access to digital resources, disparities in digital skills, and differential capacities to benefit from digital technologies. These shared concerns indicate a growing convergence toward understanding digital inequality as a structural condition that shapes life chances, reinforces class-based advantages, and contributes to the reproduction of social stratification in contemporary societies. In this sense, digital inequality is increasingly conceptualized not as a temporary technological gap, but as a persistent form of social inequality.

Nevertheless, important theoretical and analytical divergences remain within the field. Economically oriented studies tend to focus on productivity, income distribution, and regional development, often emphasizing macro-level outcomes of digital transformation. In contrast, social justice–oriented research foregrounds issues of educational inequality, citizenship, and access to public services, while stratification-focused approaches emphasize class, gender, and spatial hierarchies in digital participation. This fragmentation has resulted in parallel bodies of literature that rarely engage in sustained dialogue with one another, limiting the development of integrated theoretical frameworks that connect economic processes, justice concerns, and stratification dynamics.

Furthermore, much of the existing literature examines digital inequality through isolated analytical lenses, such as access, skills, or usage, without sufficiently integrating these dimensions into a cohesive conceptual model. Empirical studies often prioritize specific social groups or national contexts, which, while valuable, can obscure broader structural patterns. Additionally, research output remains unevenly distributed geographically, with a strong concentration on certain regions, thereby constraining the global comparability and inclusiveness of digital inequality scholarship. As a result, a significant gap persists in the absence of a synthesized analytical framework that systematically links digital inequality to broader processes of social stratification across diverse socio-economic contexts.

Addressing this gap provides the theoretical and methodological justification for the present study. By combining a Systematic Literature Review with bibliometric analysis, this research seeks to move beyond fragmented perspectives and offer a comprehensive mapping of publication trends, dominant themes, and conceptual developments in digital inequality research. This integrated approach enables a clearer understanding of the intellectual structure of the field and supports the identification of underexplored areas and future research directions within the study of digital inequality and social stratification.

3. Methodology

This study employs a hybrid methodological approach integrating a Systematic Literature Review (SLR) with bibliometric analysis to examine global research trends in digital inequality and social stratification. This combination enables both a systematic synthesis of existing literature and a quantitative mapping of publication patterns, thematic clusters, and intellectual structures within the field. The SLR component allows for a critical and structured evaluation of prior studies, while bibliometric analysis provides insight into citation networks, keyword co-occurrence patterns, and research productivity across countries and institutions. Together, these methods offer a comprehensive understanding of the development and conceptual structure of digital inequality research.

3.1 Data Source and Search Strategy

The Scopus database was selected as the primary source of data due to its extensive coverage of peer-reviewed international publications and its suitability for bibliometric analysis. Scopus is widely recognized for its multidisciplinary scope, comprehensive bibliographic metadata, and compatibility with bibliometric visualization software such as VOSviewer. These advantages make Scopus particularly appropriate for identifying publication trends, thematic developments, and intellectual structures related to digital inequality and social stratification research.

The search process was conducted on 14 February 2026 using the TITLE-ABS-KEY function in Scopus to maximize retrieval relevance. The search query employed combinations of keywords associated with digital inequality and social stratification using Boolean operators. The final search syntax used was as follows:

TITLE-ABS-KEY (“digital inequality” OR “digital divide” OR “digital stratification” OR “digital inclusion“) AND TITLE-ABS-KEY (“social stratification” OR “social inequality”)

The search initially identified 408 publications. To ensure analytical consistency and relevance, the dataset was limited to peer-reviewed journal articles indexed in Scopus. Duplicate records were subsequently removed, resulting in 408 remaining publications. The screening process was then conducted through title and abstract evaluation to assess the relevance of each study to the research objectives. At this stage, 142 publications were excluded because they did not sufficiently address the relationship between digital inequality and social stratification.

Following the screening stage, 266 full-text articles were assessed for eligibility. Further exclusions were made based on document type and thematic irrelevance, resulting in the removal of 41 publications. Ultimately, 225 studies were included in the final dataset for systematic literature review and bibliometric analysis.

The final dataset was exported in compatible formats for bibliometric mapping and visualization using VOSviewer, while qualitative synthesis was conducted within the Systematic Literature Review (SLR) framework to identify dominant themes, conceptual developments, and future research directions in the field.

3.2 Inclusion and Exclusion Criteria

Clear inclusion and exclusion criteria were established to ensure the relevance, consistency, and methodological rigor of the dataset. Only peer-reviewed journal articles written in English and explicitly addressing digital inequality, digital divide, or digital stratification in relation to social inequality or social stratification were included.

Publications such as conference papers, book chapters, editorials, review articles, errata, letters, dissertations, and other non-peer-reviewed documents were excluded. Studies that mentioned digital technologies without directly engaging with inequality or stratification dimensions were also removed during the screening process. These criteria ensured that the final dataset consisted of original and methodologically robust research articles directly relevant to the study's objectives.

3.3 Screening Procedure (PRISMA)

The screening and selection process followed the PRISMA 2020 guidelines to enhance transparency, replicability, and methodological rigor (Page et al., 2021). The PRISMA framework was applied to systematically document the stages of identification, screening, eligibility, and inclusion.

During the identification stage, all records retrieved from the Scopus database using the predefined search query were exported for further processing. Duplicate records were removed, and the remaining publications were screened based on titles and abstracts to assess their relevance to digital inequality and social stratification. Studies that addressed digital technologies without explicitly engaging with inequality, stratification, or related socio-economic dimensions were excluded at this stage.

In the eligibility phase, full-text assessments were conducted to ensure conceptual alignment with the study's objectives. Additional exclusions were applied based on language criteria and document type restrictions. Only English language peer-reviewed journal articles were retained. Publications written in other languages and non-journal formats were removed to ensure consistency and analytical comparability.

Following the completion of all PRISMA stages identification, screening, eligibility, and inclusion a total of 225 articles were retained for the final analysis. The complete screening process is visually summarized in Figure 1, which presents the PRISMA flow diagram detailing each stage of article selection.

3.4 Bibliometric Analysis Procedures

Bibliometric analysis was conducted using VOSviewer software to examine bibliographic coupling, co-citation networks, and keyword co-occurrence patterns within the selected dataset. This approach enabled the visualization of intellectual structures and thematic concentrations in digital inequality research.

A minimum threshold of five keyword occurrences was applied to ensure that the resulting clusters were analytically meaningful and not driven by marginal or infrequent terms. Co-occurrence analysis was used to identify dominant research themes and conceptual relationships among key terms. Bibliographic coupling and co-citation analyses were conducted to reveal influential publications, intellectual linkages, and theoretical foundations shaping the field. Additionally, co-authorship analysis was performed to map collaboration patterns among authors, institutions, and countries.

The results of the bibliometric analysis were subsequently integrated with the findings of the Systematic Literature Review. This integration enabled a comprehensive synthesis of theoretical orientations, empirical patterns, and contextual developments in research on digital inequality and social stratification.

3.5 Limitations

Despite the systematic and rigorous methodological approach employed in this study, several limitations should be acknowledged. First, the study relied exclusively on the Scopus database as the primary source of publications. Although Scopus was selected due to its broad multidisciplinary coverage, standardized bibliographic metadata, and suitability for bibliometric analysis, the use of a single database may have resulted in the exclusion of relevant studies indexed in other databases such as Web of Science, Google Scholar, Dimensions, or regional indexing platforms. Consequently, the dataset may not fully represent the entirety of global scholarship on digital inequality and social stratification.

Second, this study was limited to English-language publications. While this criterion was applied to ensure consistency and analytical coherence during the review process, it may have reduced the representation of perspectives originating from non-English-speaking regions. Considering that digital inequality is a global phenomenon shaped by diverse socio-cultural, economic, and political contexts, excluding non-English publications may limit the inclusiveness and geographical diversity of the findings.

Third, bibliometric analysis primarily relies on publication metadata such as keywords, citations, authorship information, and publication trends. Although this approach is effective for identifying thematic patterns, intellectual structures, and collaborative networks, it may not fully capture the depth of theoretical debates, contextual interpretations, or methodological nuances contained within individual studies. To reduce this limitation, the present study integrated bibliometric analysis with a Systematic Literature Review (SLR), enabling a more comprehensive interpretation of the existing literature.

Finally, the findings of this study were also influenced by the selected search keywords and inclusion criteria applied during the data collection process. Although the search strategy was systematically designed to maximize relevance and coverage, some potentially relevant studies may not have been identified due to variations in terminology, indexing practices, or keyword usage across publications.

Future research is therefore encouraged to expand database coverage, incorporate multilingual datasets, conduct comparative cross-database analyses, and employ complementary qualitative or mixed-method approaches to further enrich the understanding of digital inequality and social stratification in contemporary societies.

(PRISMA 2020 flow diagram illustrating identification, screening, eligibility, and inclusion stages; final dataset: n = 225 articles)

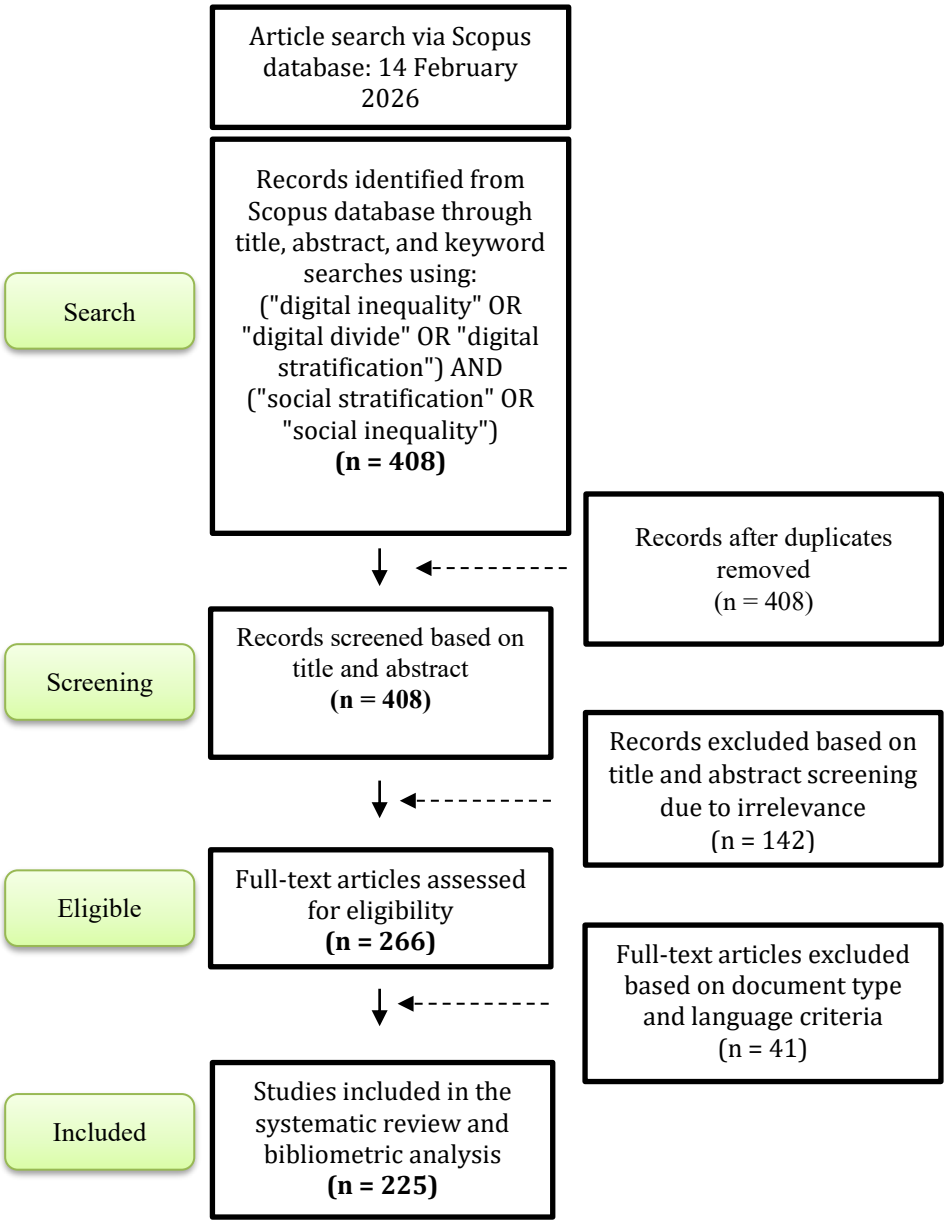

Figure 1. Systematic Literature Review information flow using PRISMA

According to the search results retrieved from the Scopus database on February 14, 2026, a search was conducted using the query (“digital inequality” OR “digital divide” OR “digital stratification” OR “digital inclusion”) AND (“social stratification” OR “social inequality”) applied to article titles, abstracts, and keywords. This initial search identified a total of 408 documents. Following the PRISMA 2020 screening procedure, records that were not relevant to the research focus were excluded based on title and abstract screening. Subsequently, full-text articles were assessed for eligibility, and non-eligible document types and non-English publications were removed. After the screening and eligibility stages, 225 peer-reviewed journal articles remained and constituted the final dataset for the systematic literature review and bibliometric analysis (see Figure 1).

4. Results

The analysis draws on 225 articles from the Scopus database-an impressive body of work that shows just how far the study of Digital Inequality and Social Stratification has progressed. The data reveal not only how publication numbers have changed over time but also the patterns behind them: which journals shape the conversation, who the leading scholars are, and how their ideas intersect across institutions and countries.

RQ1: *Publication trends and intellectual structure*

Based on the Scopus data (Figure 1), the earliest publications addressing digital inequality and social stratification in contemporary societies appeared in 2001. During the early 2000s, the number of publications remained relatively low and sporadic, indicating that scholarly attention to this topic was still limited. A gradual increase became visible after 2010, reflecting growing academic interest in the social consequences of digital transformation. From around 2018 onward, publication output rose more sharply, marking a period of accelerated growth. The field reached its highest publication volume in 2026, with more than 45 documents published in that year. The apparent decline in 2026 can be attributed to incomplete indexing of publications for the ongoing year rather than a substantive decrease in research activity.

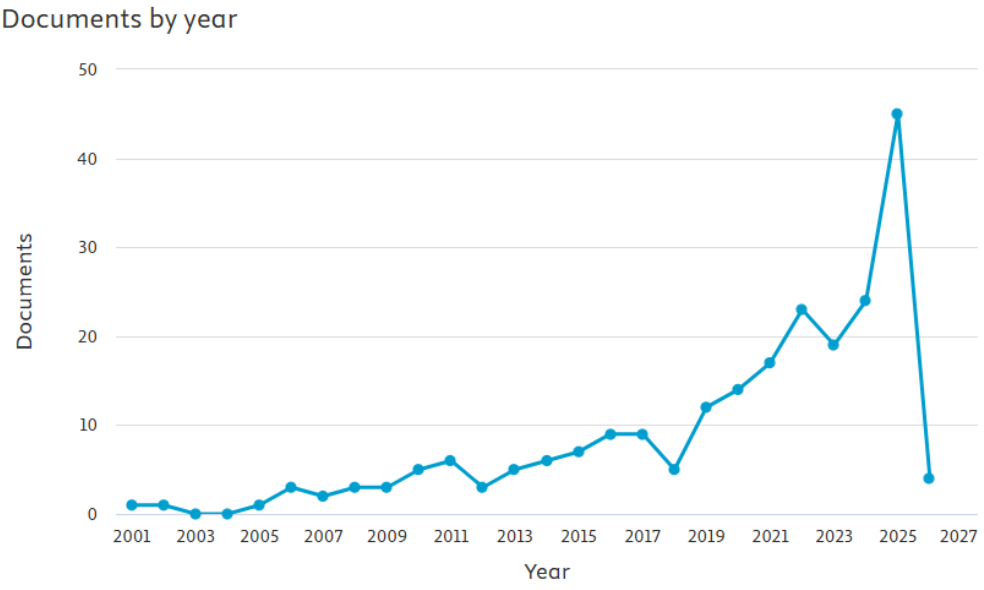

Figure 2. Number of Digital Inequality and Social Stratification

Source: Scopus database

Looking at the historical development of digital inequality research, early scholarly discussions primarily emerged from concerns surrounding health informatics, communication technologies, and cultural divisions in access to information technologies (McPherson & Wilkinson, 2001). During the early 2000s, research on digital inequality remained relatively limited and predominantly focused on issues of technological access, internet connectivity, and infrastructural disparities across social groups. At this stage, most studies adopted a descriptive orientation, emphasizing unequal access to digital resources rather than examining the broader structural implications of inequality and social stratification. The bibliometric patterns identified in this study also confirm that early research networks were relatively fragmented, with limited thematic integration between technological and sociological perspectives.

As the field continued to evolve, scholarly attention gradually shifted toward the social consequences of digital inequality in areas such as education, labor markets, healthcare, and public services. Existing studies increasingly demonstrated that digital disparities are closely intertwined with broader forms of social stratification associated with class, education, age, gender, and geographic location (Halford & Savage, 2010; Helsper & Reisdorf, 2017; Yu, 2011). This transition reflects an important transformation in the intellectual orientation of the field, moving from a predominantly technological perspective toward a more sociological and stratification-based analytical framework. The keyword co-occurrence network further illustrates this shift through the growing centrality of terms such as "social inequality," "education," "digital participation," and "social exclusion," indicating that contemporary discussions increasingly frame digital inequality as part of broader structural inequalities rather than merely a problem of technological access.

More recently, the significant increase in publications after 2020 reflects heightened academic concern following global disruptions caused by the COVID-19 pandemic. During this period, research increasingly focused on vulnerable and marginalized populations, including students, older adults, persons with disabilities, and low-income communities, particularly in relation to remote learning, digital health services, and online public administration (Cho & Kim, 2021; Engzell et al., 2021; Robinson et al., 2020). Bibliometric clustering patterns also demonstrate the emergence of new thematic concentrations related to online learning, digital resilience, public health, and digital inclusion. The strong interconnections among these clusters suggest that the pandemic accelerated interdisciplinary engagement between sociology, education, health studies, and public policy research. These developments indicate that contemporary digital inequality research has expanded beyond a narrow focus on technological access and connectivity. Current scholarship increasingly incorporates perspectives related to social justice, digital capital, digital participation, and the reproduction of social inequality, positioning digital inequality as a central issue within contemporary sociological and policy-oriented research.

The citation and collaboration networks identified in this study further reveal that research on digital inequality and social stratification remains unevenly distributed across global academic contexts. Scholarly production is still heavily concentrated in high-income and technologically advanced countries, particularly within Western and Anglo-European institutions. The centrality of these countries within collaboration networks indicates their dominant role in shaping theoretical perspectives, methodological approaches, and research agendas in the field. In contrast, weaker collaborative links involving institutions from the Global South suggest continuing disparities in global knowledge production and academic visibility. This imbalance implies that existing understandings of digital inequality are still largely informed by Western socio-economic contexts, while experiences from underrepresented regions remain comparatively limited. Consequently, future research would benefit from broader geographic representation and stronger cross-regional collaboration in order to develop a more inclusive and globally grounded understanding of digital inequality and social stratification.

RQ2: *Which theoretical and contextual domains dominate the field of Digital Inequality and Social Stratification?*

To address the second research question, this study examined the geographical distribution and contextual concentration of research on digital inequality and social stratification. The analysis was conducted using all 225 articles included in the final dataset and categorized according to the country or territory associated with each publication. Given the size and diversity of the dataset, the discussion focuses on the ten most productive countries in order to highlight broader structural patterns and dominant research contexts within the field.

The findings indicate that research production remains highly concentrated in a limited number of academically and technologically advanced countries. The United States emerges as the most dominant contributor, with 50 publications, reflecting a strong and sustained scholarly focus on digital inequality across domains such as education, labor markets, healthcare, public policy, and marginalized populations. The centrality of the United States within the publication and collaboration networks also suggests its influential role in shaping theoretical frameworks, methodological approaches, and research agendas related to digital inequality and social stratification. The United Kingdom follows with 21 publications, demonstrating a strong tradition of sociological and policy-oriented scholarship on digital exclusion, welfare systems, and social inequality. China, with 17 publications, represents the

most significant contributor from Asia, reflecting increasing scholarly attention to the social consequences of rapid digital transformation, including urban-rural divides, regional inequality, educational disparities, and uneven technological development.

Several European countries also occupy important positions within the field. Spain contributes 16 publications, while Germany and the Netherlands each account for 11 publications. These studies commonly focus on digital inclusion, welfare regimes, educational inequality, and the relationship between technological change and social stratification. The strong interconnectedness among European research networks further indicates active regional collaboration and the influence of European policy frameworks in shaping discussions on digital inclusion and social cohesion. Australia and Italy each contribute 10 publications, demonstrating that research on digital inequality is increasingly expanding beyond traditional Anglo-American academic centers. Meanwhile, the Russian Federation also contributes 10 publications, highlighting growing interest in digital stratification within post-socialist and transitional socio-economic contexts. Finland, with 7 publications, reflects the continuing engagement of Nordic welfare-state scholars with issues related to digital equality, public access, and social inclusion.

The collaboration and publication patterns identified in this study further reveal that countries with comparatively smaller publication volumes, including Australia, Germany, Italy, the Netherlands, Spain, Finland, and the Russian Federation, are increasingly making meaningful contributions to the field. Although their publication outputs remain below those of the United States and the United Kingdom, their growing presence demonstrates that research on digital inequality is progressively developing as a transnational and interdisciplinary domain of inquiry. Scholars across different regions are increasingly examining how digital technologies intersect with social mobility, structural disadvantage, public services, and inequalities in access and participation across diverse socio-economic settings.

At the same time, the collaboration network reveals persistent inequalities in global knowledge production. Research activity remains heavily concentrated within North American and Western European institutions, where traditions of sociological stratification research, digital society studies, and technological innovation are more firmly established. These regions generally possess stronger research infrastructures, greater access to funding, higher levels of digital development, and broader integration into international publication networks. Consequently, they occupy central positions within global academic collaboration networks and play a dominant role in shaping theoretical frameworks, methodological approaches, and policy discussions related to digital inequality.

This geopolitical concentration also carries important implications for the intellectual development of the field. Because much of the existing literature is produced within high-income and technologically advanced societies, dominant interpretations of digital inequality tend to reflect Western institutional experiences and socio-economic conditions. As a result, forms of digital exclusion experienced in developing countries, rural regions, and marginalized communities in the Global South may remain comparatively underrepresented within mainstream scholarship. The weaker visibility and lower centrality of institutions from the Global South within collaboration networks suggest continuing inequalities not only in digital access and infrastructure, but also in global knowledge production and academic representation.

Nevertheless, the increasing research output from Asian and Eastern European contexts, particularly from China and the Russian Federation, reflects broader international engagement with the social consequences of digital transformation. Emerging studies from these regions increasingly address issues such as regional inequality, urban-rural disparities, unequal digital infrastructure, and access to online public services, thereby contributing alternative empirical perspectives to the field. This trend indicates a gradual diversification of research contexts and analytical approaches beyond traditional Western-centric frameworks.

Overall, these findings suggest that research on digital inequality and social stratification is becoming progressively more global in scope, although intellectual leadership and publication dominance continue to be shaped primarily by Anglo-American and Western European academic traditions. The expanding participation of countries outside these traditional centers signals a gradual diversification of empirical settings, theoretical perspectives, and contextual approaches. At the same time, the uneven distribution of scholarly production highlights that digital inequality is not

only reflected in technological access and social participation, but also reproduced within the structures of global academic knowledge production itself.

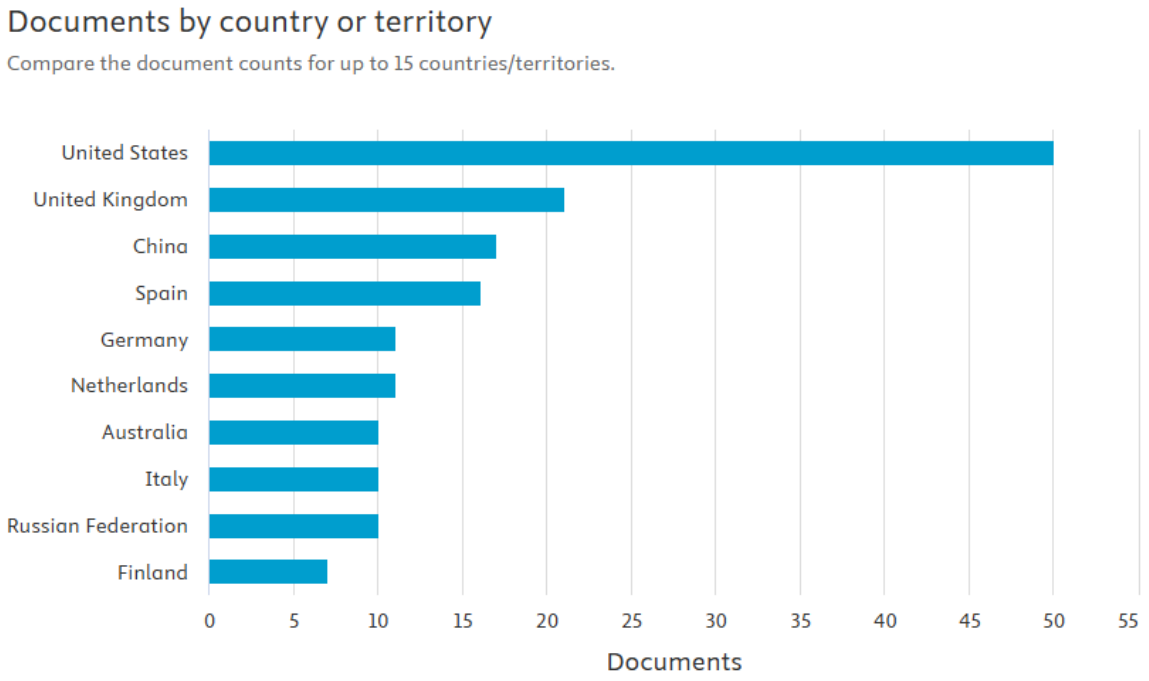

Figure 3. Number of articles by country or territory (top 10 countries)

Source: Scopus database

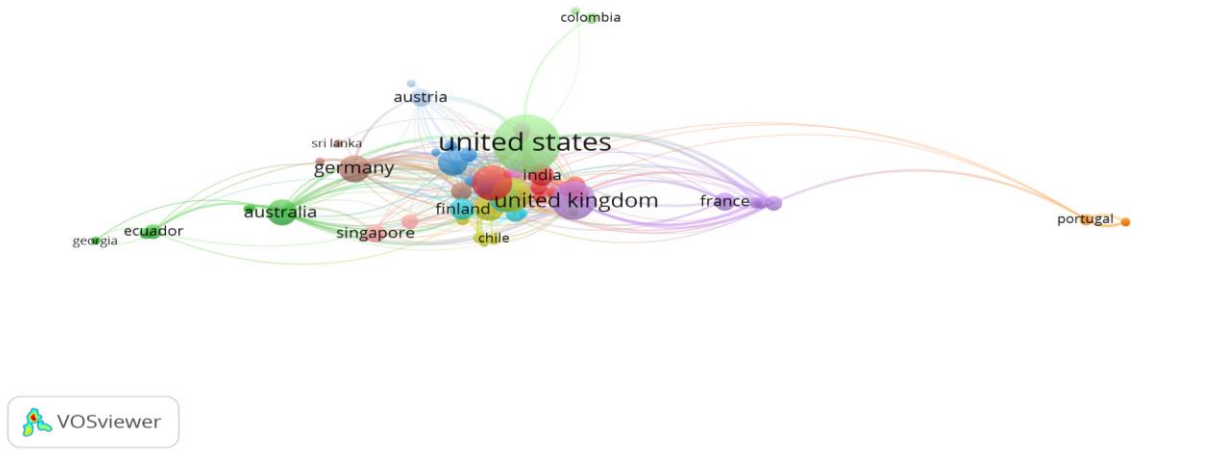

Figure 4. Network country visualization

Source: Output VOSviewer software

Increasingly, countries with comparatively smaller publication volumes, including Australia, China, Germany, the Netherlands, Italy, the Russian Federation, Spain, and Finland, are making meaningful contributions to the field of

digital inequality and social stratification. Although their publication counts remain below those of the United States and the United Kingdom, their growing presence demonstrates that research on digital inequality is no longer confined to a single national or academic tradition. Instead, the field is increasingly developing as a transnational domain of inquiry in which scholars collectively examine digital access, digital skills, social mobility, public services, and structural disadvantage across diverse socio-economic contexts. The growing interconnectedness among these countries within the collaboration network also suggests that digital inequality research is becoming more internationally integrated and interdisciplinary in nature.

This pattern further indicates that while much of the scholarship remains concentrated within North American and Western European institutions where traditions of sociological stratification research and digital society studies are more firmly established the field is gradually expanding beyond these dominant academic centers. The strong centrality of Anglo-American and Western European institutions within the collaboration network reflects their continuing influence in shaping theoretical frameworks, methodological standards, and policy discussions related to digital inequality. This dominance is closely associated with stronger research infrastructures, greater access to international publication networks, higher levels of digital development, and more substantial research funding opportunities.

At the same time, the rising output from Asian and Eastern European contexts, particularly from China and the Russian Federation, reflects broader global engagement with the social consequences of digital transformation, including urban-rural divides, regional disparities, unequal digital infrastructure, and unequal access to public services. The emergence of these countries within new collaborative clusters suggests a gradual diversification of the intellectual structure of the field, as alternative socio-economic and political contexts increasingly contribute empirical evidence and analytical perspectives that differ from dominant Western-centered approaches. Nevertheless, weaker network centrality and more limited international collaboration involving many developing countries indicate that global knowledge production on digital inequality remains unevenly distributed.

Overall, these developments indicate that digital inequality research is progressively becoming more globally distributed, even though intellectual leadership and publication dominance continue to be shaped largely by Anglo-American and Western European academic traditions. The expanding participation of countries outside these traditional centers signals not only a diversification of empirical settings and analytical perspectives, but also a gradual shift toward a more globally grounded understanding of how digital technologies intersect with social stratification across different institutional, cultural, and developmental contexts. At the same time, the unequal concentration of research productivity and collaboration networks suggests that patterns of inequality are reproduced not only in digital access and participation, but also within the global structure of academic knowledge production itself.

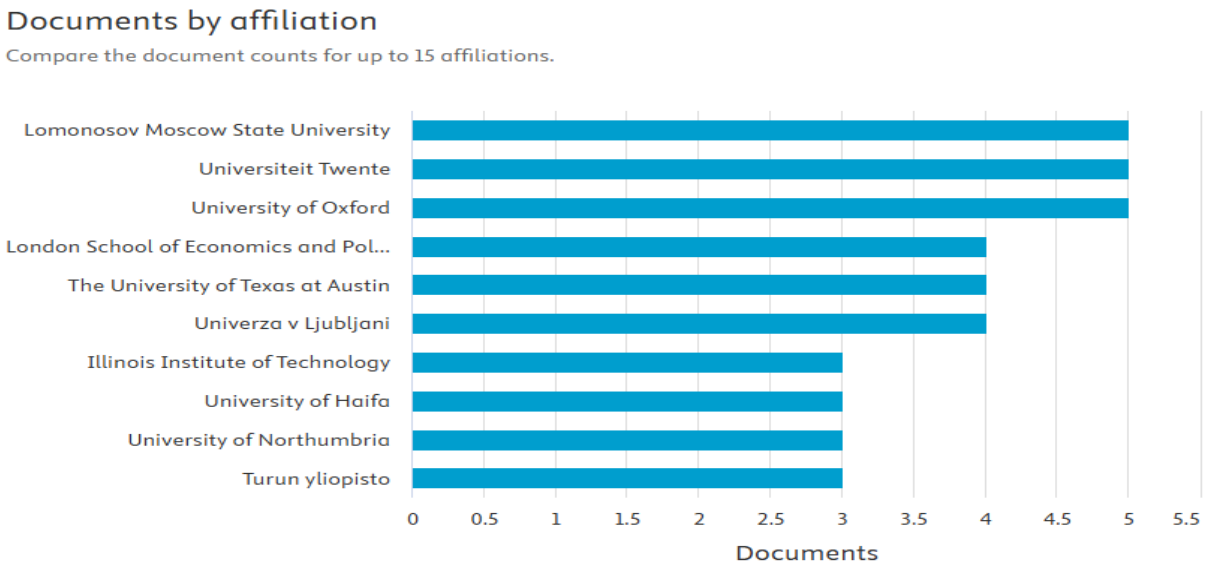

Figure 5. Number of articles by affiliation

Source: Scopus Database

These findings confirm that research on digital inequality and social stratification is not concentrated within a single institutional context or confined exclusively to Anglo-American universities. Several institutions demonstrate notable and consistent contributions to the field. Lomonosov Moscow State University, Universiteit Twente, and the University of Oxford each contribute five publications, positioning them as influential institutional actors within the dataset. Their strong presence within the collaboration network reflects established research traditions in digital society studies, social stratification, and technology policy across different European academic contexts. The relatively high centrality of these institutions also suggests their important role in shaping theoretical debates, methodological approaches, and international research collaborations within the field.

Other prominent institutions include the London School of Economics and Political Science, the University of Texas at Austin, and the University of Ljubljana, each contributing four publications. These institutions represent diverse academic traditions spanning Western Europe, North America, and Central Europe, further illustrating that digital inequality research has developed across multiple intellectual and policy-oriented contexts. At the same time, the dominance of institutions located in high-income and technologically advanced countries reflects broader inequalities in global academic infrastructure, research funding, publication visibility, and access to international collaboration networks. Institutions with stronger global academic connectivity are more likely to occupy central positions within collaboration and citation networks, thereby exerting greater influence over dominant conceptual frameworks and research agendas.

Additional contributions come from the Illinois Institute of Technology, the University of Haifa, Northumbria University, and the University of Turku, each with three publications. The diversity of these institutions spanning North America, Western Europe, Eastern Europe, and the Middle East underscores the increasingly transnational character of the field. However, the institutional network also reveals uneven patterns of collaboration and visibility. While some universities function as important international collaboration hubs, others remain comparatively peripheral within the global research structure. This unevenness suggests that institutional influence is shaped not only by publication productivity, but also by access to international academic networks and citation visibility.

Taken together, these institutional patterns reinforce the expanding global scope of digital inequality research while simultaneously highlighting persistent geopolitical inequalities in global knowledge production. Although the field

increasingly incorporates contributions from diverse institutional contexts, intellectual leadership remains concentrated within universities located in Europe and North America. Consequently, dominant theoretical perspectives and empirical priorities continue to be shaped largely by institutions operating within Western socio-economic and technological contexts. This concentration has important implications for the development of the field, as experiences and forms of digital inequality from underrepresented regions may receive comparatively less visibility within mainstream academic discourse. Future research would therefore benefit from stronger institutional collaboration involving universities from the Global South in order to foster a more inclusive and globally representative understanding of digital inequality and social stratification.

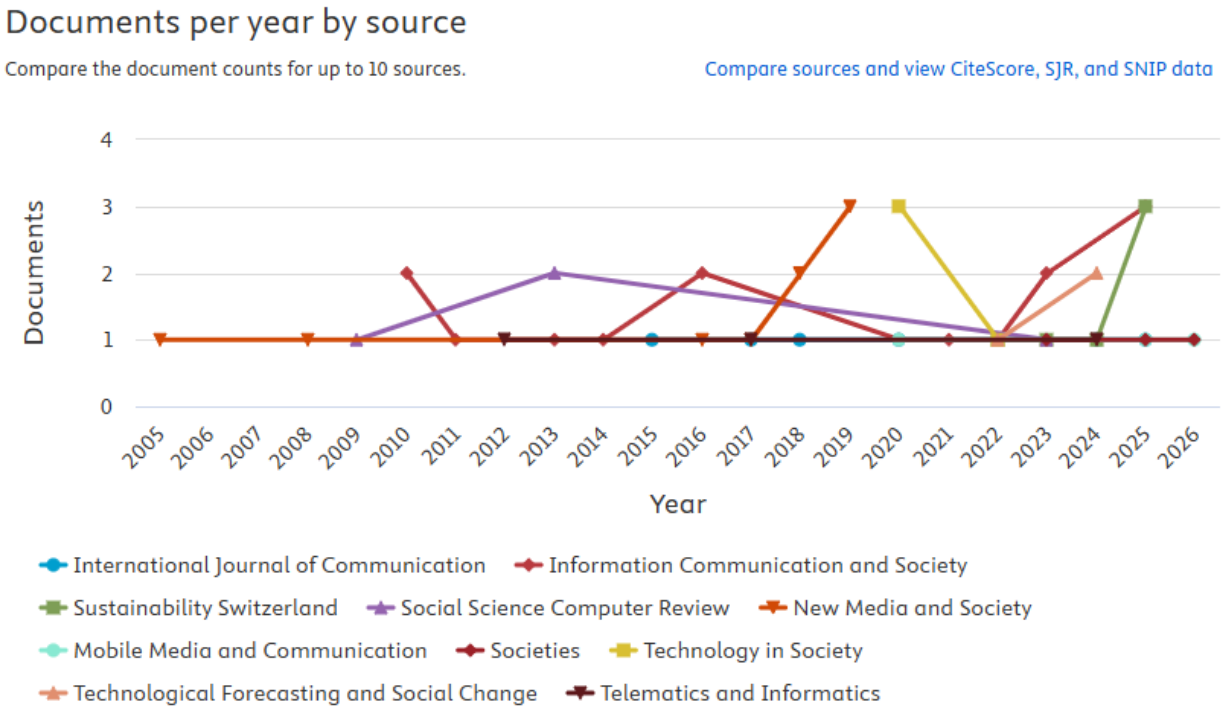

Figure 6. Number of articles by sources (top 10 sources)

Source: Scopus database

These findings confirm that research on digital inequality and social stratification is far from being concentrated within a single journal or disciplinary outlet. Instead, the field is distributed across a diverse range of high-impact international journals that bridge communication studies, sociology, technology studies, and interdisciplinary social science. Among the most prominent sources, Information, Communication & Society stands out as the leading outlet with 15 publications, indicating its central role in shaping debates on digital access, online participation, and structural inequalities in digital inequality and social stratification

Other journals playing a significant role include New Media & Society with 9 publications, as well as the International Journal of Communication and Sustainability, each contributing 6 publications. These outlets reflect the interdisciplinary positioning of digital inequality research, combining perspectives from media studies, communication theory, sustainability, and socio-technical systems.

Additional contributions are found in Technology in Society and Social Science Computer Review, each with 4 publications, alongside Mobile Media & Communication, Societies, Technological Forecasting and Social Change, and Telematics and Informatics, each contributing 3 publications. The presence of these journals demonstrates that the

study of digital inequality intersects with broader discussions on technological change, digital media ecosystems, innovation, and social transformation.

The consistent contributions from these diverse publication venues reinforce the interdisciplinary and global nature of digital inequality research. Rather than being confined to a narrow subfield, the scholarship evolves across communication studies, sociology, information science, and technology policy. This distribution of sources highlights how digital inequality has become an established and cross-cutting research domain that transcends disciplinary boundaries and reflects multiple theoretical traditions and socio-political contexts.

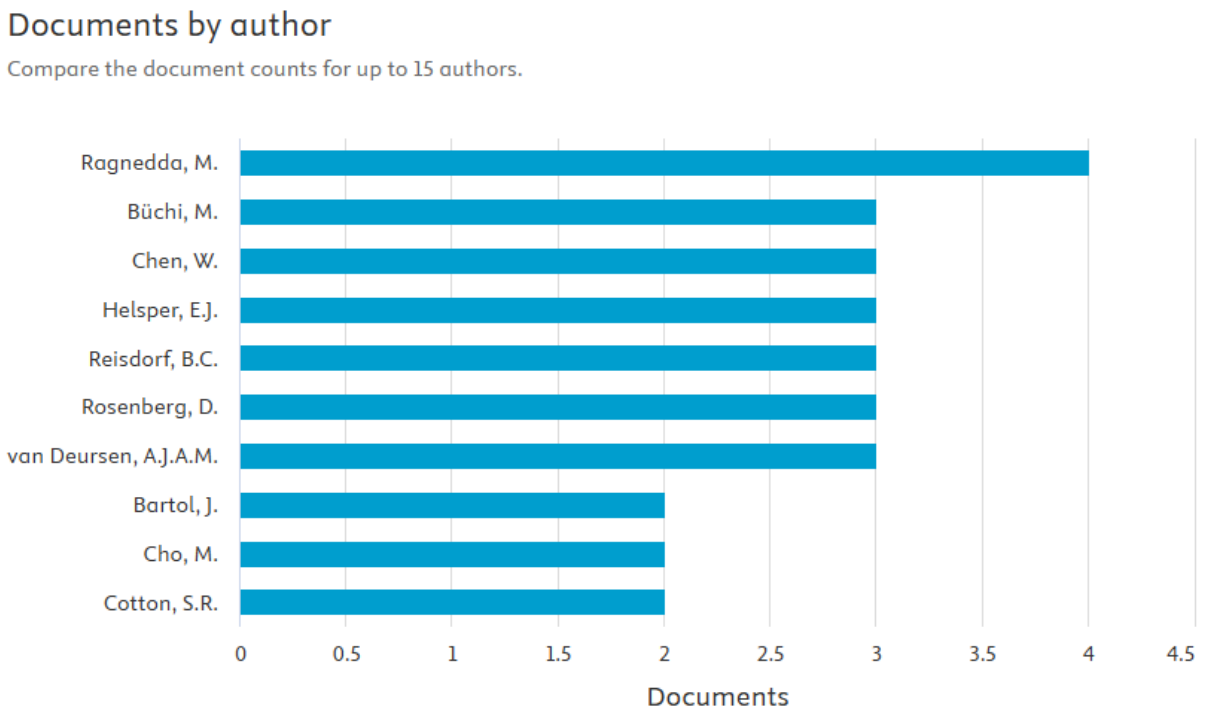

Figure 7. Count of publications by authors (top 10 authors)

Source: Scopus database

Fourth, the analysis of research distribution by author shows that the field of digital inequality and social stratification is shaped by a relatively small yet highly productive group of scholars. Among them, Massimo Ragnedda stands out as the most prolific contributor, with 4 publications, reflecting his influential role in advancing debates on digital capital, social stratification, and structural inequalities in digital societies.

He is followed by several prominent scholars who each contribute 3 publications, including Moritz Büchi, Wenhong Chen, Ellen J. Helsper, Bianca C. Reisdorf, David Rosenberg, and Alexander J.A.M. van Deursen. Their collective contributions have been central in developing theoretical models of digital skills, usage inequalities, digital outcomes, and the multidimensional nature of digital exclusion.

Additional contributions come from scholars such as Jernej Bartol, Moon Cho, and Shelia R. Cotton, each with 2 publications. Although their publication counts are smaller, their work contributes important empirical and

contextual insights into issues such as vulnerable populations, education, aging, and social participation in digital inequality and social stratification.

This authorship pattern indicates a concentration of expertise within a core network of leading researchers whose work has significantly shaped the intellectual development of digital inequality studies. At the same time, the presence of multiple contributors with moderate publication outputs suggests a broadening scholarly community. Together, these authors drive theoretical refinement, empirical diversification, and the continued integration of digital inequality research within broader discussions of social stratification, digital capital, and structural disadvantage.

RQ3: *What future research directions can contribute to a more integrated understanding of digital inequality in contemporary societies?*

Figure 8 highlights the most frequently used keywords in digital inequality and social stratification research: Digital Divide (1267), Social Inequality (440), Digital Inequality (274), Internet Access (271), Digitization (162), Social Class (160), Technological Development (155), Information and Communication Technology (138), Educational Status (122), and Digital Inclusion (116).

These terms reveal more than a simple list of recurring topics; they reflect an ongoing scholarly dialogue about how digital technologies intersect with social structures and unequal life chances. The prominence of keywords such as digital divide, social inequality, and social class underscores that digital inequality research is deeply rooted in sociological concerns with stratification, power, and resource distribution, rather than being limited to technical or infrastructural questions alone.

At the same time, the frequent appearance of terms related to internet access, digitization, and information and communication technology indicates that technological change remains a central context through which social inequalities are produced and negotiated. Keywords associated with educational status and digital inclusion further highlight the strong connection between digital inequality and institutional settings such as education systems, labor markets, and public services, where unequal access to digital resources can translate into long-term disadvantages.

Collectively, this keyword pattern demonstrates that digital inequality research has evolved beyond a narrow focus on access disparities. It now represents an interdisciplinary meeting point that integrates sociology, communication studies, education, and technology studies to examine how digital transformation reshapes social inequality. Moving forward, developing a more holistic framework for digital inequality will require greater integration of structural, cultural, and contextual perspectives, as well as broader empirical attention to underrepresented regions and social groups.

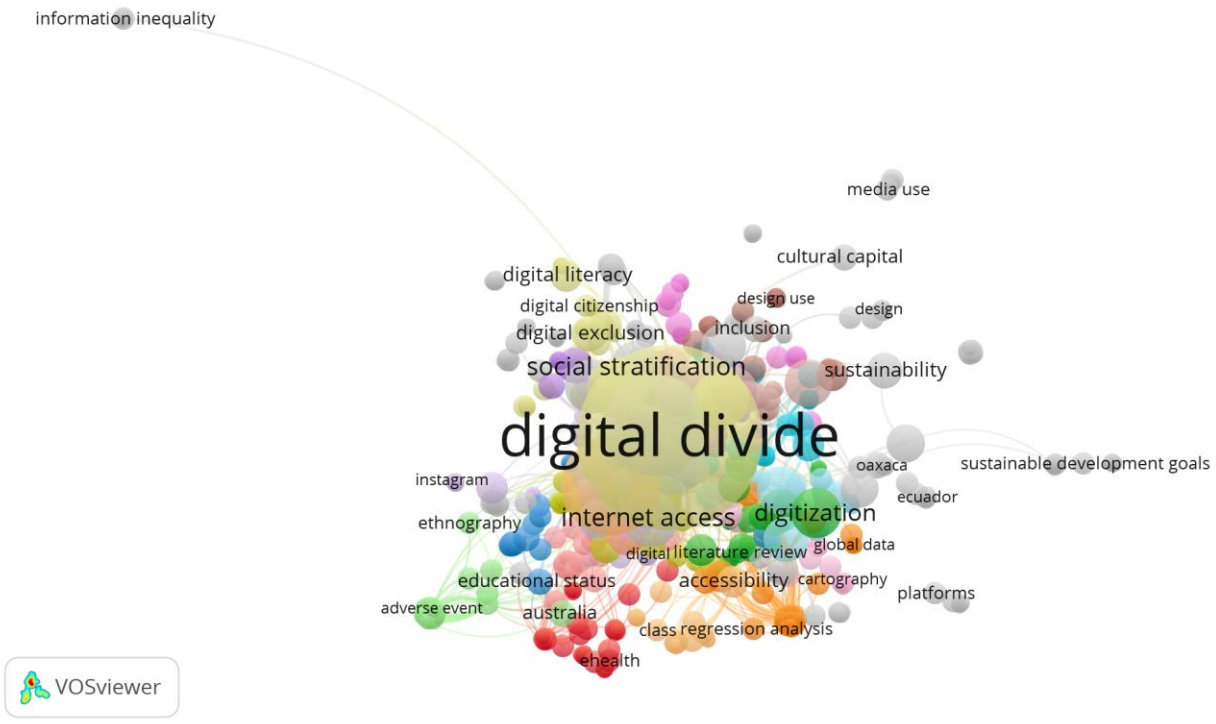

Figure 8. Co-occurrence framework and representation of key terms

Source: Output VOSviewer software

Table 2: Keyword of Digital Inequality and Social Stratification.

	Keyword	**Total Link Strength**
1	Digital Divide	1267
2	Social Inequality	440
3	Digital Inequality	274
4	Internet Access	271
5	Digitization	162
6	Social Class	160
7	Technological Development	155
8	Information and Communication Technology	138
9	Educational Status	122
10	Digital Inclusion	116

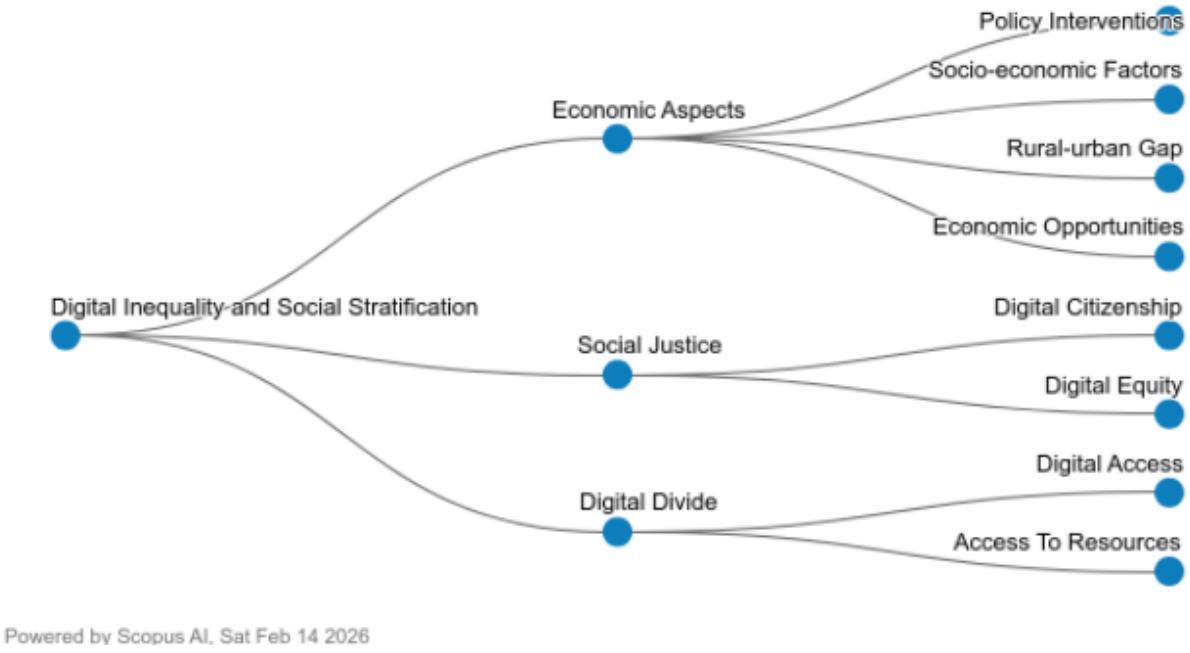

Figure 9. Digital Inequality and Social Stratification Attribute

S*ource: Adopted from previous research* (Büchi & Hargittai, 2022; Engzell et al., 2021; González-Betancor et al., 2021; Halford & Savage, 2010; Hilbert, 2015; Liu et al., 2017a; Martini & Sgambato, 2025; Ragnedda & Muschert, 2015; Rosenberg, 2020; Tian, 2025; van Deursen et al., 2017; Willekens et al., 2022; Zhao & Kuang, 2025; Zilian & Zilian, 2020)

As illustrated in the conceptual model (see Figure 9), the framework is hierarchically structured around the central concept of digital inequality and social stratification, which branches into three major and interconnected domains: economic aspects, social justice, and digital divide. These domains should not be interpreted as isolated dimensions, but rather as analytically distinct yet structurally interconnected components that collectively shape the multidimensional nature of digital stratification (Halford & Savage, 2010; Zilian & Zilian, 2020). The clustering structure identified in the conceptual mapping further indicates that these three domains function as the primary intellectual pillars within the literature, reflecting the dominant theoretical orientations shaping contemporary research on digital inequality.

Conceptually, this framework is grounded in broader theories of social stratification and digital capital, which argue that unequal access to resources, skills, and participation opportunities contributes to the reproduction of existing social hierarchies within digital environments (Ragnedda & Muschert, 2015). The model also draws upon digital divide theory, particularly perspectives emphasizing that inequalities in digital access, competencies, and outcomes are closely linked to broader socio-economic structures rather than merely technological differences (Hilbert, 2015; van Deursen et al., 2017)In this regard, digital inequality is understood not simply as a technological gap, but as a multidimensional process through which structural inequalities are reproduced and legitimized in digitally mediated societies.

The first domain, economic aspects, encompasses structural elements such as socio-economic inequality, regional disparities, policy interventions, labor-market dynamics, and unequal access to economic opportunities. Existing studies demonstrate that digital transformation interacts closely with pre-existing economic structures, often

reinforcing unequal patterns of development and social mobility (Liu et al., 2017a; Martini & Sgambato, 2025). The strong conceptual linkage between economic factors and digital access within the network structure suggests that digital inequality is increasingly understood not merely as a technological issue, but as a structural economic condition embedded within broader systems of capitalism, labor-market stratification, and uneven regional development. Studies also show that socio-economic status and geographic location significantly shape individuals' ability to benefit from digital infrastructures, particularly in contexts characterized by rural-urban divides and unequal technological investment (Tian, 2025; Zhao & Kuang, 2025). The relatively central position of economic-related concepts within the framework indicates that material inequalities continue to function as a foundational driver of digital stratification.

The second domain, social justice, focuses on normative concerns related to fairness, equity, inclusion, and meaningful participation within digital society. Within this branch, concepts such as digital equity, digital citizenship, and social inclusion highlight the importance of ensuring equal opportunities for participation in digital environments (Büchi & Hargittai, 2022; Rosenberg, 2020). Empirical findings consistently indicate that unequal access to digital resources deepens educational, civic, and participatory inequalities, particularly among socio-economically disadvantaged groups (Engzell et al., 2021; González-Betancor et al., 2021). The increasing prominence of this cluster within recent research networks suggests a broader normative shift in the field, where digital inequality is increasingly framed not only as a problem of access and infrastructure, but also as a question of social justice, democratic participation, and citizenship rights. This shift reflects the growing influence of critical sociological and policy-oriented approaches that examine how digital exclusion affects life chances and reproduces broader systems of social inequality (Martini & Sgambato, 2025; Zilian & Zilian, 2020).

The third domain, digital divide, represents the foundational analytical layer of the model and remains one of the most central and highly interconnected clusters within the conceptual network. This dimension includes disparities in digital access, access to technological resources, digital skills, and patterns of technology use. Existing studies consistently demonstrate that digital engagement is strongly shaped by socio-economic status, education, age, gender, and geographic context, while differences in digital competence influence individuals' ability to transform online participation into social and economic advantages (Hilbert, 2015; van Deursen et al., 2017; Willekens et al., 2022). The strong centrality of the digital divide cluster within the conceptual framework indicates that access inequality continues to function as the foundational mechanism through which broader patterns of social stratification are reproduced in digital environments. At the same time, the network connections between digital divide concepts and the domains of economic inequality and social justice illustrate that digital exclusion operates simultaneously as a technological, economic, and socio-political phenomenon (Ragnedda & Muschert, 2015; Zilian & Zilian, 2020).

Taken together, the three domains depicted in Figure 9 illustrate a structured yet dynamically interconnected conceptual model. Economic structures shape access and opportunity, social justice principles provide normative evaluations of inequality, and digital divide mechanisms explain how disparities in access and digital competence translate into stratified social outcomes. The strong interconnections among these domains suggest that digital inequality should be understood as a multidimensional and systemic phenomenon rather than as an isolated technological problem.

By integrating economic structures, justice-oriented perspectives, and digital divide mechanisms within a single conceptual framework, this study contributes theoretically to the literature by positioning digital inequality as a multidimensional process of social reproduction. Rather than treating digital exclusion solely as a problem of technological access, the framework demonstrates how digital inequalities are embedded within broader systems of economic inequality, institutional power, and social stratification. In this sense, the model extends existing digital divide approaches by incorporating sociological perspectives on power, inequality, and structural disadvantage into the analysis of digital transformation. More broadly, the conceptual structure identified in this study demonstrates that contemporary scholarship increasingly positions digital inequality as a central mechanism through which existing forms of social stratification are reproduced, intensified, and legitimized within digitally mediated societies (Liu et al., 2017; Martini & Sgambato, 2025).

5. Discussion

Early studies on digital inequality laid important conceptual foundations by highlighting disparities in access to information and communication technologies and their implications for social participation (McPherson & Wilkinson, 2001; Yu, 2006). Initially, much of the literature treated digital inequality as a technical or infrastructural issue, focusing primarily on connectivity, device ownership, and basic internet access. Building on these foundations, the present review demonstrates that digital inequality should not be understood as a collection of isolated technological gaps, but rather as an integrated structural condition in which socio-economic, institutional, and technological dimensions are systematically interconnected (Hilbert, 2015; Ragnedda & Muschert, 2015; van Deursen et al., 2017). This integrative perspective addresses a key limitation of earlier studies, which often examined access, skills, or usage separately without sufficiently accounting for their cumulative and reinforcing effects on social stratification (Helsper & Reisdorf, 2017; Scheerder et al., 2019).

Previous scholarship consistently emphasizes that digital inequalities are socially embedded and relational rather than independent or static phenomena. Within this framework, socio-structural conditions such as income, education, age, and geographic location shape individuals' access to digital resources and their capacity to engage meaningfully with digital technologies (Hilbert, 2015; Liu et al., 2017a; Zilian & Zilian, 2020). These conditions interact with digital resources and capabilities, including connectivity and digital skills, to produce differentiated patterns of digital engagement. As illustrated in the conceptual model, unequal digital use is not merely a consequence of access deficits, but reflects deeper structural inequalities that determine who can convert digital participation into tangible social and economic benefits (Büchi & Hargittai, 2022; van Deursen et al., 2017).

The process-level dynamics identified in this review highlight the mediating role of education systems, labor markets, and public services in translating digital engagement into unequal life chances. Empirical studies demonstrate that individuals from higher socio-economic backgrounds are more likely to leverage digital technologies for educational attainment, occupational mobility, and civic participation, while disadvantaged groups often experience limited returns from similar levels of digital access (Helsper & Reisdorf, 2017; Martini & Sgambato, 2025; Räsänen et al., 2021). This unequal conversion of digital resources into outcomes reinforces existing hierarchies of class and status, supporting the argument that digital inequality operates as a mechanism of stratification rather than a neutral technological phenomenon (Halford & Savage, 2010; Ragnedda & Muschert, 2015).

At the output level, the literature converges on the view that digital inequality has become institutionalized within contemporary societies. Unequal life chances in education, employment, health services, and public administration increasingly reflect differential digital inclusion, particularly in contexts where essential services are mediated through digital platforms (Büchi & Hargittai, 2022; Robinson et al., 2020). As shown in the model, these outcomes feed back into the broader social structure, sustaining the reproduction of inequality across generations. Digital exclusion thus functions not as a temporary transitional problem, but as a durable structural condition that shapes long-term social stratification (Hilbert, 2015; Zilian & Zilian, 2020).

Despite the growing conceptual sophistication of digital inequality research, important gaps remain. Much of the literature continues to focus on Western and high-income contexts, while structural dynamics in developing regions and peripheral areas receive comparatively less attention (Liu et al., 2017b; Uy-Tioco, 2019). Moreover, while policy-oriented studies increasingly address digital inclusion, fewer analyses critically examine how institutional arrangements may unintentionally reproduce exclusion through standardized digital governance and market-driven technological development (Scheerder et al., 2019; van Deursen et al., 2017).

From a theoretical and practical perspective, the conceptual framework proposed in this study integrates these insights across three analytical levels. At the input level, socio-structural conditions, digital resources, and institutional contexts establish the foundational inequalities shaping digital engagement (Hilbert, 2015; Liu et al., 2017b; Zilian & Zilian, 2020). At the process level, differentiated digital engagement and social–economic mediation explain how digital skills and access are unevenly transformed into benefits through education, work, and civic participation (Helsper & Reisdorf, 2017; Martini & Sgambato, 2025; van Deursen et al., 2017). At the output level,

these processes culminate in unequal life chances and the institutionalization of digital inequality as a structural condition that sustains social stratification over time (Büchi & Hargittai, 2022; Ragnedda & Muschert, 2015; Robinson et al., 2020).

Taken together, this discussion reinforces the argument that digital inequality is not a peripheral technological concern, but a central mechanism through which contemporary societies reproduce and reorganize social hierarchies. By conceptualizing digital inequality as an integrated structural process rather than a fragmented set of access problems, this study contributes to a more coherent analytical framework for understanding the enduring relationship between digital transformation and social stratification.

5.1 Theoretical Distinctiveness and Novelty

Unlike prior systematic literature reviews or standalone bibliometric studies that tend to treat digital access, literacy, and usage as isolated or fragmented phases (Helsper & Reisdorf, 2017; van Deursen et al., 2017), this study's findings explicitly demonstrate that digital inequality operates as a continuous, cumulative structural feedback loop. While existing reviews frequently conclude that providing hardware or basic connectivity mitigates stratification, our cross-institutional mapping reveals that deep-seated social stratification actually intensifies after physical access is achieved, because higher socio-economic groups convert digital capital into disproportionately higher material and civic returns. This shifts the scholarly conversation from a descriptive "access-deficit" paradigm to a critical "structural-reproduction" paradigm.

5.2 Multidimension Implication Framework

Based on this structural synthesis, the findings yield critical implications across three interconnected pillars:

1. Digital Policy Implications: Governments and policymakers must move beyond market-driven, technological infrastructure deployment. Standardized digital governance often introduces algorithmic biases and institutional barriers that unintentionally exclude vulnerable populations. Policy interventions should pivot toward targeted digital capital investments, expanding localized training, and ensuring that digital public administration services maintain non-digital or highly supportive hybrid safety nets for marginalized communities.
2. Educational Implications: In the post-pandemic landscape, remote and digitally mediated learning can exacerbate educational stratification rather than equalize it. Educational institutions should avoid treating digital skills as mere technical tools. Instead, curricula must focus on critical digital literacy-teaching students how to evaluate information, leverage networks for social mobility, and translate digital engagement into educational capital, thereby preventing the intergenerational transmission of disadvantage.
3. Social Justice Implications: This study positions digital inclusion not as a technical milestone, but as a core normative tenet of modern citizenship and human rights. True social justice in a digitally mediated society requires addressing the asymmetrical distribution of digital capital. Eradicating digital exclusion is essential to ensuring equitable life chances, safeguarding democratic participation, and preventing established social hierarchies from being permanently legitimized and locked within digital environments.

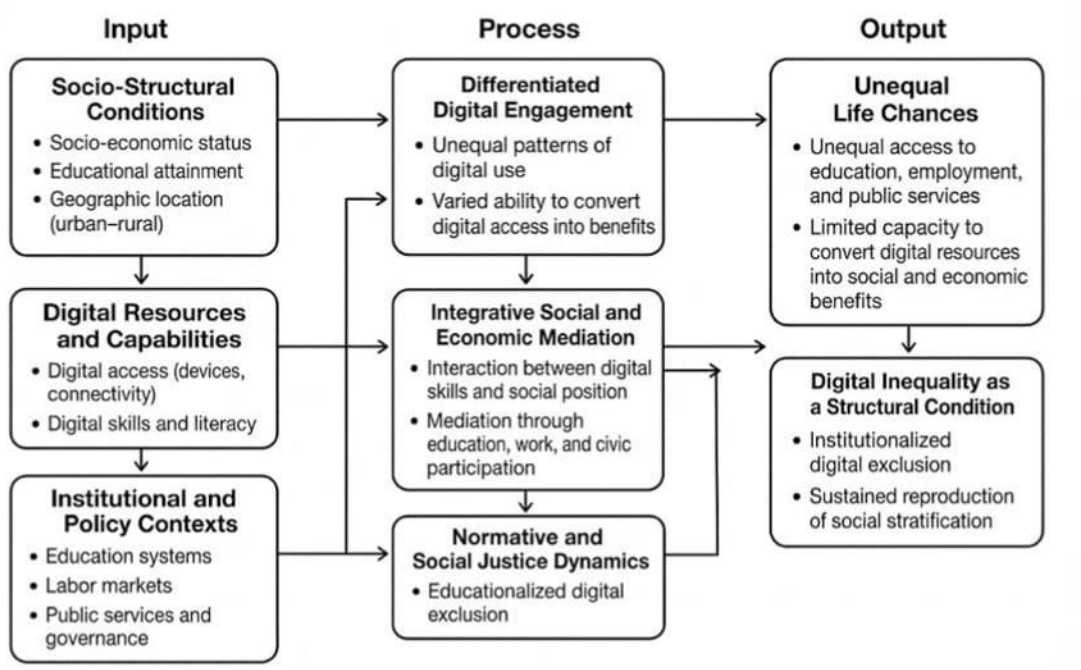

Figure 10. Conceptual model of Digital Inequality and Social Stratification

Source: Author's elaboration based on Digital Inequality and Social Stratification

Figure 10 presents an integrative conceptual model of digital inequality and social stratification, structured across input, process, and output dimensions. The model illustrates how socio-structural conditions and digital resources interact through differentiated patterns of digital engagement, ultimately producing unequal life chances and the reproduction of social stratification in contemporary societies.

6. Conclusion

Digital inequality has evolved into a structurally embedded dimension of contemporary social stratification that extends far beyond early concerns about technological access. Based on a Systematic Literature Review (SLR) of 225 peer-reviewed articles, this study maps the intellectual development of digital inequality research and synthesizes its dominant conceptual trajectories. The findings indicate that scholarly production remains concentrated in Western and high-income countries, while the dominant thematic areas revolve around digital access and skills, socio-economic disparities, institutional mediation, and the reproduction of unequal life chances in education, labor markets, and civic participation.

This study contributes to the literature by offering an integrated analytical framework that conceptualizes digital inequality as a multi-level structural process rather than a fragmented set of technological gaps. Methodologically, it demonstrates the value of employing a systematic and transparent review design to identify recurring conceptual patterns, theoretical foundations, and structural mechanisms within a large body of research. Conceptually, the study advances a synthesized model structured across input, process, and output dimensions, showing how socio-structural conditions and digital resources shape differentiated digital engagement, which in turn produces unequal life chances and sustains the reproduction of social stratification.

The findings carry important theoretical and practical implications. Theoretically, they reinforce the view that digital inequality should be understood as a core mechanism of contemporary stratification, intersecting with education systems, labor markets, and institutional arrangements. Practically, the results underscore the need for policy approaches that move beyond expanding access alone and instead address inequalities in digital skills, usage patterns, and the capacity to convert digital engagement into social and economic benefits. Without such structural interventions, digital transformation risks reinforcing rather than mitigating existing social disparities.

Despite these contributions, this study has several limitations. The analysis relies exclusively on the Scopus database and includes only English-language journal articles, which may limit the representation of scholarship from non-Western contexts and emerging research communities. Future studies should incorporate additional databases, such as Web of Science, and broaden linguistic and regional coverage to capture a more globally representative understanding of digital inequality. Expanding empirical and theoretical engagement with underrepresented regions would strengthen the comparative and structural analysis of digital stratification in diverse socio-economic contexts.

Declaration

Competing Interests
None.

Ethical Approval
This study was granted an exemption from requiring ethics approval as it does not involve human participants, animal subjects, or the collection of sensitive personal data. The research is based on a systematic literature review and bibliometric methods, utilizing secondary data exclusively from the Scopus database. As such, it adheres to institutional guidelines that classify this type of study as low-risk and not subject to formal ethics approval.

Author's Contribution
Author1: Conceptualization, Data curation, Formal analysis, Software, Writing – original draft.
Author2: Supervision, Methodology, Validation, Writing – review and editing.

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