

Article

Large Family Contexts in Inclusive Education: Lights and Shadows from a Bibliometric Perspective

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Abstract

Across the literature, family involvement is recognized as a key factor for academic progress, inclusive education and personal development. However, family size is rarely examined in bibliometric analyses, despite growing attention to socioeconomic and family-related factors influencing educational participation and inequality. Although empirical evidence does not establish a direct relationship between family size and inclusive education, existing research suggests that inclusive practices are more effective when family-related challenges are acknowledged. This study maps the representation of large families within the literature addressing educational inequality, participation, and inclusion-related processes. A bibliometric and co-occurrence analysis of 395 Web of Science publications (retrieved March 2026) was conducted using VOSviewer and Microsoft Excel. Findings revealed that research emerged in the 1990s and expanded after 2016, with the United States, Ethiopia, and China as leading contributors. Six thematic clusters were identified: socioeconomic participation, child vulnerability, educational outcomes, fertility and gender dynamics, and household-level constraints. Results indicate that large families are unevenly addressed, appearing more frequently in research on educational inequality than in inclusive education. Based on these findings, the study proposes a conceptual framework describing the “lights and shadows” of large family contexts in inclusive education, capturing both constraining and enabling dimensions associated with family structure.

Keywords: inclusive education; educational barriers; educational equity; socioeconomic statuses; large families; sibship size; policy impact

1. Introduction

Inclusive education has emerged as a central paradigm in contemporary educational policy and research, and it is defined as a system that ensures equitable access, participation, and achievement for all learners (UNESCO, 2017, 2020). While students with disabilities represent a core focus of inclusive education, inclusive education scholars tend to conceptualize inclusion as a multidimensional and context-dependent process shaped by structural, social, and institutional factors rather than solely by individual learner characteristics. Scholars emphasize that inclusive education must be understood within broader frameworks of educational inequality, participation, and systemic barriers (Ainscow, 2020a; Artiles, 2011; Graham, 2020; Slee, 2018). From this perspective, the concept encompasses broader dimensions of marginalization and educational disadvantage, including those related to socioeconomic background and family circumstances (Björklund & Salvanes, 2011; Escudero & Martínez, 2011; Florian, 2008, 2014; Francisco et al., 2020). Among these



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contextual determinants, family size has been identified as a potential factor shaping educational opportunities (Ainscow, 2020b; Bredtmann & Smith, 2018; Gao et al., 2024; Halvorsen et al., 2025; Yang & Qiu, 2016).

While contemporary educational discourse in many high-income countries is increasingly shaped by concerns related to declining fertility, population aging, and shrinking school-age cohorts, these demographic realities are not globally uniform (United Nations, 2024). In ultra-low fertility educational systems, such as those characterizing much of Western Europe or similarly positioned OECD contexts (OECD, 2023, 2025), family size is rarely treated as a distinct explanatory variable within inclusive education research, where analytical attention is more commonly directed toward socioeconomic inequality, migration, disability policy, or institutional inclusion mechanisms (Caballeros et al., 2024; Hikmat, 2025). In contrast, in high-fertility or demographically transitional contexts, particularly across parts of Sub-Saharan Africa, South Asia or Latin America, household size and sibling composition continue to intersect more visibly with educational participation, resource allocation, and support structures (Berniell et al., 2026; Bongaarts, 2020). Within such settings, family structure may acquire greater empirical relevance in relation to inclusion processes, especially under conditions of economic constraint and rapid educational expansion.

Large family contexts, typically operationalized through sibship size (Blake, 1981), number of siblings, or total household composition, have been widely examined in relation to children's educational participation and learning outcomes. The literature proposes several theoretical perspectives to explain these associations, although the present study does not examine these mechanisms empirically. One of the most influential is the resource dilution theory, which suggests that while larger families incur greater total educational expenditures, the allocation of resources per child often declines (Guo et al., 2026). Previous studies have also suggested that larger households may often redistribute economic and cognitive resources across multiple children, shaping educational trajectories through variations in parental investment, home learning environments, and educational expectations (Bredtmann & Smith, 2018; Yang & Qiu, 2016). Within this literature financial constraints have been associated with reduced access to school supplies, extracurricular activities, or private tutoring, while time and attention from parents or caregivers may be unevenly distributed among children (Downey, 1995, 2001). This can result in reduced academic support, lower individual monitoring, and, in some cases, diminished educational aspirations. Some studies further argue that overcrowded living conditions and competing responsibilities may create environments that are less conducive to studying and sustained academic focus (Behrman & Taubman, 1986; Blake, 1989; Bredtmann & Smith, 2018; Gao et al., 2024). These relationships have been reported to be more pronounced in socioeconomically disadvantaged households, particularly where parental education and income are lower (Black et al., 2005; Halvorsen et al., 2025; Yang & Qiu, 2016). In addition, previous research has suggested that these conditions may influence family-school collaboration, as well as diminish participation in programs that require sustained parental engagement (Florian, 2014; Skyba et al., 2020). Consequently, studies of inclusive schooling have highlighted the importance of supporting families facing structural constraints, while recognizing that family size represents only one of several contextual factors shaping educational participation (Skyba et al., 2020). Importantly, this does not imply that larger families are inherently disadvantaged, but rather that household structure may shape educational engagement in diverse and context-dependent ways. These theoretical perspectives provide the conceptual background for the present study, which focuses on mapping how such themes are represented across the interdisciplinary literature rather than evaluating their empirical validity.

At the same time, the literature also highlights that large family contexts may generate positive educational dynamics through sibling interaction, shared learning, and extended family support structures (Blaabæk et al., 2020; Lehti et al., 2019; Steelman et al., 2002; Sulloway, 1996). Within this perspective, the concept of family social capital is particularly relevant for understanding how educational outcomes are shaped in multi-child households. Social capital refers to the networks, relationships, and norms of reciprocity that facilitate access to information, support, and learning resources (Coleman, 1988). From this point of view, growing up in a larger family may provide children with increased opportunities for social learning, cooperation, and the development of cognitive and interpersonal skills through continuous interaction within the household environment. Empirical research suggests that older siblings can play an important educational role by providing academic assistance, modeling learning behaviors, and acting as informal tutors and social guides, thereby contributing to both academic development and social integration (Bah & Kagotho, 2024; Lehti et al., 2019; Steelman et al., 2002). In addition, extended family members, including grandparents, aunts, uncles, and other kin, may play an important supportive role in children's upbringing and educational processes, contributing to care, supervision, and learning-related support, particularly in contexts where parental time and resources are constrained (Bah & Kagotho, 2024; Lehti et al., 2019). In such configurations, caregiving and educational responsibilities may be distributed across a wider familial network, potentially compensating for limited individual parental availability. Yet, dual-earner families often experience work–family conflicts that reduce the time available for direct educational support (Kelley et al., 2021; Wang et al., 2021). Furthermore, demographic changes, including declining household size, increased geographic mobility, and the predominance of nuclear family structures, may reduce the availability of support from grandparents and extended family networks. These structural conditions reinforce the importance of schools and community services in promoting equitable participation and educational inclusion for children from large families. Previous research has consistently shown that support programs for families can reduce poverty, encourage fertility, and improve children's educational and health outcomes in both the short and long term (Baker et al., 2021; Lindemann, 2025; Mari, 2024; Schoenholzer & Burger, 2024).

However, it is important to emphasize that these effects are context-dependent and non-deterministic, varying according to socioeconomic conditions, cultural norms, and the availability of external educational and institutional support. Accordingly, large family size should not be interpreted as inherently beneficial or detrimental, but rather as a structural household characteristic that may generate both enabling and constraining conditions for children's educational experiences (Blaabæk et al., 2020; Gao et al., 2024; Yang & Qiu, 2016). Understanding these intersecting influences is therefore important for advancing inclusive education, which is not only about responding to disability or classroom diversity, but also about compensating for structural differences in home environments, such as those created by large household size, that can indirectly affect learning opportunities.

Despite increasing scholarly attention to family-related determinants of educational outcomes, research on family structure and educational inclusion remains distributed across relatively distinct disciplinary traditions. Rather than constituting a unified field of inquiry, existing knowledge is dispersed across inclusive education, sociology of education, and demographic research; each field prioritizes different levels of analysis and theoretical assumptions. Within inclusive education scholarship, the dominant focus has been settled on system-level and pedagogical dimensions of inclusion, such as policy implementation, teacher beliefs and practices, and school–family partnerships (Florian, 2014; Francisco et al., 2020; Skyba et al., 2020). In this strand of literature, household characteristics, including family size, are typically incorporated as contextual background variables rather

than independent analytical constructs that may shape inclusion processes. Sociological approaches to education foreground family structure as part of broader stratification processes, emphasizing mechanisms such as social mobility, cultural capital, and intra-household resource allocation. Family size is often associated with differentiated patterns of educational investment and opportunity distribution (Bredtmann & Smith, 2018; Lehti et al., 2019). Demographic research uses indicators such as sibship size and birth order to estimate causal relationships with educational attainment but generally situated within population studies or human capital frameworks and not integrated into inclusive education discourse (Gao et al., 2024).

Another limitation of literature concerns the imbalance between studies addressing barriers and those examining enabling factors in large family contexts. Existing literature predominantly focuses on negative outcomes, including reduced parental support, limited educational resources, and increased socioeconomic vulnerability (Bah & Kagotho, 2024; Bredtmann & Smith, 2018; Luo et al., 2025; Skyba et al., 2020). Barriers such as resource dilution, constrained educational access, and structural inequalities are frequently emphasized, particularly in disadvantaged contexts (Halvorsen et al., 2025; Yang & Qiu, 2016). In contrast, enabling factors such as sibling mentorship, family social capital, and community support are less systematically investigated and often appear as secondary findings (Bah & Kagotho, 2024; Lehti et al., 2019; Skyba et al., 2020).

Conceptual ambiguity further contributes to fragmentation in the literature. Terms such as “large family”, “family size” and “sibship size” are frequently used interchangeably, despite representing distinct constructs across education, sociology, and demography. Table 1 provides the working definitions adopted in the present study to clarify the analytical distinctions between these concepts.

Table 1. Working definitions of family-related concepts and their typical disciplinary use adopted in this study.

Term	Working Definition Used in This Study	Typical Disciplinary Context
Large family	A broad contextual concept referring to households with a greater-than-average number of children or siblings. In contemporary sociological and economic studies within low-fertility, developed nations (like the US or European countries), a family is typically classified as “large” if it contains 3 or more children (Aprea et al., 2025; Chanfreau et al., 2024; Chen & Gietel-Basten, 2025; Luo et al., 2025; Saenz et al., 2025; Stamoulis & Pierrakos, 2023).	Education, sociology, social policy
Family size	The total number of individuals within a household or family unit (Banerjee et al., 2025; OECD, 2025; United Nations, 2019)	Sociology, education, demography
Sibship size	The number of siblings (brothers and sisters) within a family (Blake, 1989; Chanfreau et al., 2024; Chen & Gietel-Basten, 2025; Guo et al., 2026; Saenz et al., 2025; Sheppard & Monden, 2020)	Demography, population studies
Birth order	The order in which a child is born within the sibling group (e.g., first-born, middle-born, last-born) (Saenz et al., 2025; Vaghchipawala, 2023)	Demography, developmental research

Source: Authors’ processing.

These conceptual inconsistencies complicate comparisons across studies and contribute to divergent findings regarding the educational implications of large family contexts (Bredtmann & Smith, 2018; Gao et al., 2024). At the same time, the limited integration of socioeconomic, demographic, and educational perspectives continues to restrict interdis-

disciplinary synthesis and reduce the contextual and policy relevance of existing research (Florian, 2014; Yang & Qiu, 2016).

Beyond conceptual fragmentation, the literature also lacks bibliometric analyses examining the relationship between large family contexts and inclusive education. Existing reviews typically address inclusive education, disability, or educational inequality without systematically mapping research trends related to family size. As a result, publication patterns, thematic clusters, influential authors, and emerging research directions remain insufficiently mapped. The absence of bibliometric synthesis limits the identification of disciplinary segmentation, under-researched enabling factors, and gaps in knowledge related to inclusive education in large family contexts.

Given these limitations, the present study aims to provide a bibliometric analysis of the interdisciplinary literature addressing large family contexts in relation to educational inequality, participation, and inclusion-related processes. The intention is not to claim that family size should be a central explanatory variable in inclusive education research, but rather to highlight a systematic imbalance in how it is treated within the literature, given that family size:

- is frequently operationalized as part of composite disadvantage indicators (e.g., poverty, or household composition indices);
- is less often isolated as a distinct explanatory variable, despite evidence from demographic and educational research suggesting it may interact independently with educational outcomes (e.g., resource dilution mechanisms, sibling competition effects, and caregiving burden within households);
- may be under-theorized within inclusive education models that prioritize school-level rather than household-level determinants.

Specifically, the study pursues the following research objectives: (RO1) to identify the temporal evolution of research on large family contexts within the literature addressing educational inequality and inclusion-related processes; (RO2) to highlight the most influential ideas contributing to this field; (RO3) to determine the main thematic clusters emerging from Web of Science literature; (RO4) to identify what educational barriers associated with large families are represented in the literature; (RO5) to identify possible enabling factors such as sibling support, family social capital, and community networks are represented in the literature; and (RO6) to highlight research gaps and emerging directions for inclusive education in large family contexts. By integrating bibliometric mapping with thematic analysis, this study contributes to clarifying fragmented research and advancing understanding of how family size is represented within the literature addressing educational inequality and inclusion-related processes. In doing so, it aims to generate new insights and stimulate dialogue that can contribute to creating a consistent framework for the stakeholders involved; the analysis outcomes may bring into attention the role of family and family involvement, as well as the contribution of educational strategies in the development of the society. As the large family context has a multidimensional nature, the analysis encompasses literature from multiple disciplinary fields, without restricting the review to the Educational Research category. This approach provides a broader understanding of the factors shaping educational inclusion and inequality in large family contexts.

2. Materials and Methods

This study employs a bibliometric approach to map the research landscape addressing inclusive education in large family contexts. Bibliometric analysis is widely used to synthesize scholarly literature, identify thematic structures, and examine publication trends, citation networks, and conceptual relationships within a research field (Donthu et al., 2021). By quantifying patterns of scientific production and knowledge development, bibliometric

methods provide a comprehensive overview of disciplinary evolution and emerging research directions (van Eck & Waltman, 2010). Such approaches are particularly suitable for fragmented research areas, where multiple disciplines contribute to diverse perspectives and conceptual frameworks.

The data were collected on 26 March 2026 from the Web of Science Core Collection, which is widely recognized as a reliable database for bibliometric research due to its high-quality indexing standards and citation tracking capabilities (van Eck & Waltman, 2010). Web of Science is frequently used in bibliometric studies to identify influential publications, analyze citation patterns, and map research structures across disciplines. Although Scopus, ERIC, and Dimensions also index relevant educational research, the Web of Science Core Collection was selected because it ensures consistency in metadata structure, citation indexing, and document classification. The search strategy included keyword combinations related to large family contexts, education, and inclusive education. The search query was applied to the Topic field (TS), which includes title, abstract, and keywords, ensuring comprehensive coverage of relevant publications. The search string used in the Web of Science database was:

```
TS=
("large family" OR "large families" OR "family size" OR "sibship size" OR "number
of siblings")
AND
("education" OR "educational attainment" OR "academic achievement" OR "school
performance" OR "school participation" OR "learning outcomes")
AND
("inclusive education" OR "educational inequality" OR "educational disadvantage"
OR "access to education" OR "barriers to learning" OR "participation" OR "equity"
OR "inclusion").
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The use of multiple keyword variants was intended to capture conceptual diversity in literature and reduce the risk of excluding relevant studies. Similar search strategies have been widely applied in bibliometric research to ensure comprehensive retrieval of publications across interdisciplinary domains (van Eck & Waltman, 2010). Although the search strategy included terms directly related to inclusive education, the dataset also captured a broader interdisciplinary literature addressing family size, educational participation, socioeconomic inequality, and demographic determinants of educational outcomes. Among the 395 retrieved documents, 54 publications (13.7%) explicitly included terms such as "inclusive education", "inclusion", "inclusive schooling", or "educational inclusion". Therefore, the findings should be interpreted as reflecting the broader relationship between large family contexts, educational inequality, and inclusion-related processes rather than exclusively the field of inclusive education in its narrow pedagogical sense. This broader approach was adopted because research on large family contexts extends beyond studies explicitly labelled as "inclusive education". Restricting the search to this term alone would have excluded relevant literature. Accordingly, the findings should be interpreted as a bibliometric mapping of the broader interdisciplinary literature. This interpretative boundary also applies to the thematic clusters and the proposed conceptual framework.

Following the initial retrieval, the records were manually screened by one of the authors, based on titles, abstracts, and keywords to verify their relevance to the study objectives and the consistency of the retrieved dataset. Publications were considered eligible if they matched the predefined search strategy, addressing large family contexts in relation to education, educational participation, educational inequality, or inclusion-related processes. The search was limited to research articles and review articles indexed in the Web of Science Core Collection. Early access articles were retained when complete bibliographic informa-

tion was available. Other document types, including conference papers, editorial material, book chapters, letters, and meeting abstracts, were excluded through the predefined search filters. No duplicate records or publications requiring exclusion were identified; therefore, all 395 retrieved records were retained for the bibliometric analysis. Subsequently, the coding of the dataset, data cleaning, and interpretation of the thematic clusters were performed collaboratively by all three authors. Any differences in interpretation were discussed until consensus was reached, ensuring consistency throughout the analytical process. No formal inter-rater reliability statistic was calculated, as coding decisions were resolved through consensus among the authors. No external expert validation was sought during the development of the search strategy, cluster interpretation, or conceptual framework, as these stages were conducted collaboratively by the research team using established bibliometric procedures and VOSviewer outputs. The final dataset was subsequently cleaned and standardized prior to analysis in VOSviewer (version 1.6.20) and Microsoft Excel.

The retrieved records were exported from Web of Science as full records including cited references and processed for bibliometric analysis. The analysis was conducted using VOSviewer (version 1.6.20), a Java-based software specifically developed for constructing and visualizing bibliometric networks. VOSviewer enables the mapping of co-occurrence relationships, citation networks, and thematic clusters, allowing for the visualization of knowledge structures within a research field (van Eck & Waltman, 2010). In addition, Microsoft Excel was used for descriptive statistical analysis and trend visualization.

The bibliometric analysis included several indicators commonly used to map research landscapes. First, publication trends were examined to identify the temporal evolution of research on large family contexts and inclusive education. Tracking the number of publications over time allows identification of growth patterns, emerging interest, and shifts in scholarly attention. Second, keyword co-occurrence analysis was conducted to identify major research themes and conceptual relationships. Co-occurrence mapping examines how keywords appear together within publications, revealing thematic clusters and interdisciplinary connections. This method allows the identification of dominant topics such as family size, educational inequality, social capital, and inclusive education. Third, citation and co-citation analyses were performed to identify influential publications and intellectual structures within the field. Citation analysis examines the frequency with which publications are cited, while co-citation analysis identifies relationships between frequently cited sources. These techniques reveal knowledge flows, core research areas, and influential authors within literature. Fourth, country analysis was conducted to identify geographic distribution and international collaboration patterns. This analysis provides insight into research productivity and regional contributions to the field. Finally, thematic clustering was performed using VOSviewer clustering algorithms. This approach groups keywords and publications into thematic domains based on co-occurrence relationships. Thematic clusters enable the identification of major research areas, including educational inequality, family structure, socioeconomic constraints, and enabling factors in large family contexts. Such clustering is particularly useful for identifying both barriers and facilitators associated with inclusive education.

The bibliometric analysis followed four main stages (Figure 1), each designed to ensure a systematic and reproducible review of the literature.

This multi-stage procedure provides the basis for interpreting barriers and enabling factors associated with large family contexts and inclusive education, as well as identifying research gaps and future directions.

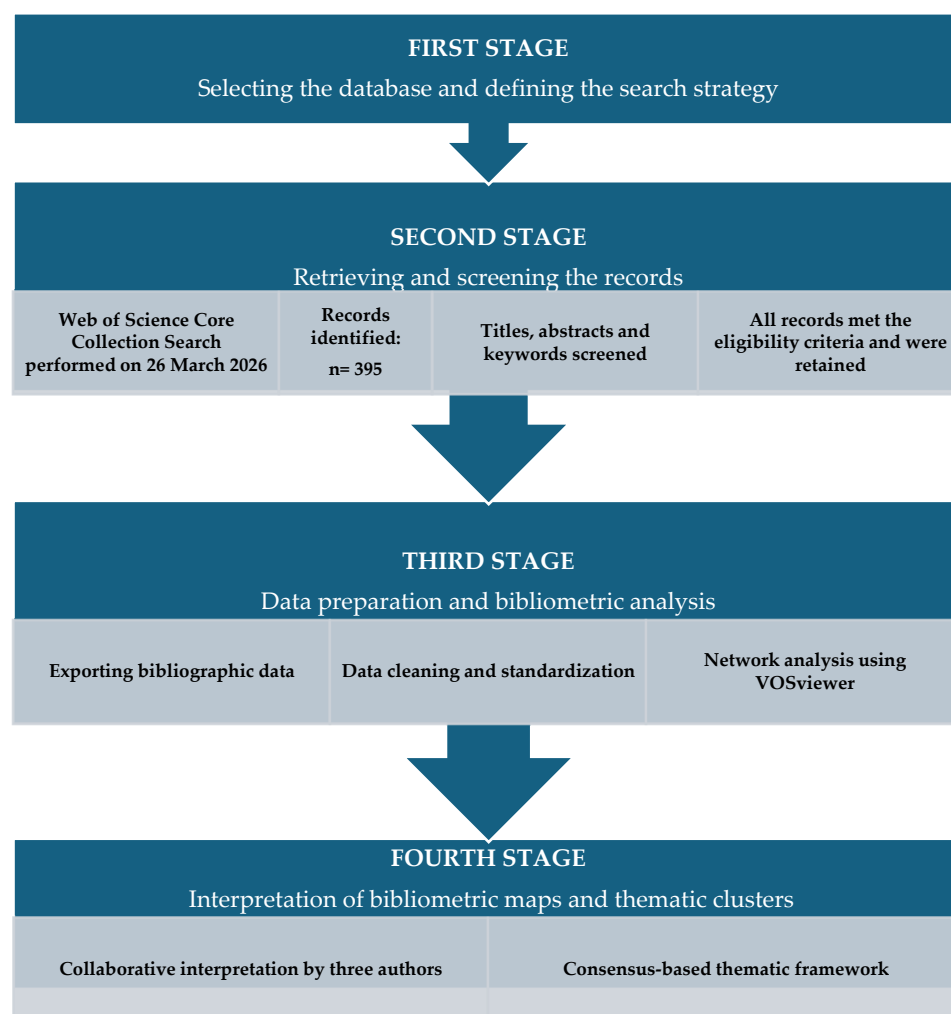


Figure 1. Workflow of the research methodology. Source: Authors' processing.

3. Results

Before mentioning the main results and findings, a notable observation should be made, namely, the multidisciplinary nature of the retrieved literature. Even though this study started from the perspective of inclusive education, the literature revealed that not only the educational research field provided theoretical and empirical evidence for the considered research theme. The literature revealed that there are important considerations coming from sociology, psychology, social policy, family studies and public health studies fields. This important idea encompasses the fact that large-family-related problems involve multiple interactions through social, economic, psychological, and demographic mechanisms. Through this, the results have shown that the initial objectives find counterparts in the literature.

3.1. Document Type, Subject Categories Overview

The bibliometric search conducted in the Web of Science Core Collection yielded a total of 395 documents, indicating a growing and multidisciplinary body of literature addressing large family contexts and inclusive education. The distribution of document types shows that most publications are research articles, complemented by a smaller number of review articles ($n = 14$) and early access publications ($n = 8$). This predominance of empirical research suggests that the field is largely driven by applied and data-oriented studies rather than conceptual or systematic syntheses. The limited number of review papers further

supports the need for a bibliometric synthesis capable of integrating fragmented findings across disciplines.

The subject category analysis reveals a strongly multidisciplinary research landscape, with publications distributed across social sciences, demography, economics, environmental studies, and education. The largest category is Public Environmental Occupational Health ($n = 52$), followed by Economics ($n = 44$) and Demography ($n = 38$). These dominant categories indicate that research on large family contexts is frequently examined through socioeconomic, population-based, and public health perspectives. Such approaches often focus on household structure, socioeconomic inequality, and population dynamics influencing educational participation.

Environmental-related fields also represent a substantial proportion of publications, including Environmental Sciences ($n = 29$) and Environmental Studies ($n = 22$). These contributions typically examine household conditions, livelihoods, and community contexts, which indirectly influence educational access and inclusion. The presence of Agriculture Multidisciplinary ($n = 21$) further highlights the relevance of rural livelihoods and household economic structures in shaping educational opportunities within large families.

Education-specific research is represented by Educational Research ($n = 22$), indicating that although inclusive education constitutes a core focus of the study, the topic is frequently addressed indirectly through related disciplines. Additional categories include Sociology ($n = 24$) and Social Sciences Interdisciplinary ($n = 18$), which reflect theoretical and structural analyses of family size, social inequality, and educational participation. The presence of Green Sustainable Science Technology ($n = 19$) also indicates that some studies explore sustainability, household resilience, and community development, themes that intersect with educational inclusion in large family contexts.

3.2. Trends of Publications and Citations

The citation report indicates 7599 citing articles, 7881 total citations, and an average of 19.95 citations per document, suggesting a growing academic interest and increasing impact of research in this field. After excluding self-citations, the dataset retained 7547 citing articles and 7812 citations, confirming the robustness and external visibility of the research domain.

As seen in Figure 2, the temporal distribution of publications reveals a gradual increase in scholarly output over time. The earliest contributions appear in the early 1990s, with a limited number of publications annually. Between 1992 and 2004, the research output remained relatively low and sporadic, typically ranging from one to five publications per year. This early stage reflects the initial emergence of studies indirectly addressing family size, inequality, and educational participation. A moderate growth phase can be observed between 2005 and 2015, during which the number of publications gradually increased. This period marks the consolidation of research exploring socioeconomic inequality, family structure, and educational outcomes.

A substantial increase in publication output is evident after 2016, indicating a rapid expansion of research addressing large family contexts. From 2017 onward, annual publications show a consistent upward trend, with noticeable peaks between 2020 and 2025. The highest number of publications is observed in the most recent years, reflecting intensified scholarly attention to family-related inequalities, educational participation, and inclusive education frameworks. It should be noted that the data were collected in March 2026; therefore, publication counts for 2026 represent only a partial year and should not be interpreted as indicating a decline in research activity.

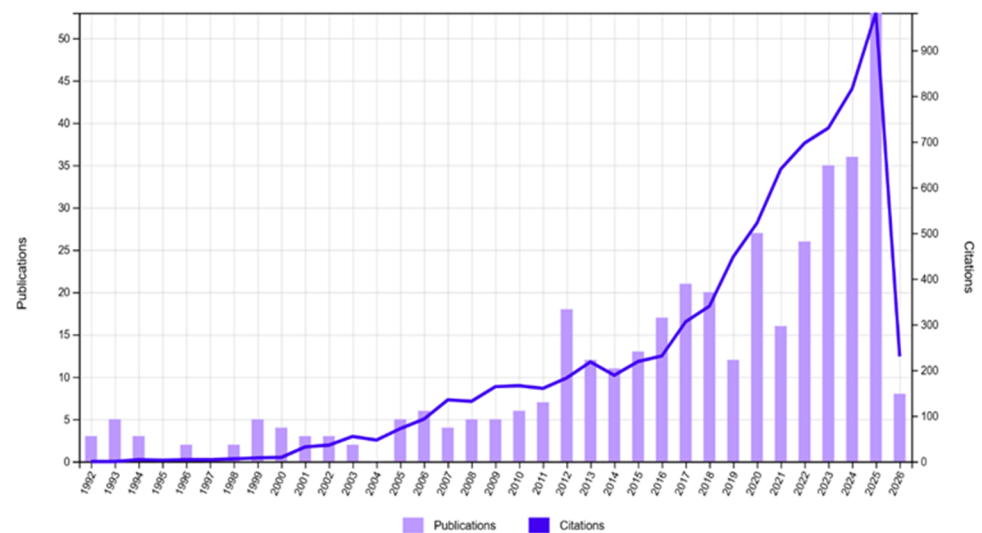


Figure 2. Annual trends in the number of publications and citations. Source: Web of Science, <https://www.webofscience.com/>.

The bibliometric search conducted in the Web of Science Core Collection yielded a total of 395 documents, indicating a growing and multidisciplinary body of literature addressing large family contexts and inclusive education. Citation trends follow a similar pattern but demonstrate a more pronounced exponential growth. Citations remain relatively low until the mid-2000s, after which a steady increase is observed. From approximately 2015 onward, citation counts rise sharply, indicating that publications in this field are increasingly referenced in subsequent research. The most significant citation growth occurs in recent years, reflecting both the expansion of literature and the increasing relevance of topics such as educational inequality, family size, and inclusive education. The interdisciplinary nature of this research field is further reflected in the diversity of publication outlets. The largest number of publications appeared in *Population Research and Policy Review* and *Discover Sustainability* (seven publications each), followed by *PLOS ONE* and *Cogent Food & Agriculture* (six publications each). Other frequently represented journals included *Demographic Research*, *Heliyon*, *Sustainability*, and *BMC Public Health* (five publications each). This distribution confirms that research on large family contexts and education extends beyond the traditional inclusive education literature, encompassing contributions from demography, public health, sustainability, and the social sciences.

3.3. Country Co-Authorship Analysis

A country co-authorship analysis was conducted using VOSviewer to examine the geographical distribution of research on large family contexts and inclusive education. The minimum threshold was set to five documents per country, resulting in 30 countries included in the analysis. The collaboration map (Figure 3) highlights a globally distributed research network structured around several influential countries and regional clusters.

The 79 documents, 2484 citations, and the highest Total Link Strength (TLS = 40) confirm its central role in international collaboration. Similarly, Ethiopia emerges as a major contributor, with 78 documents, 828 citations, and a high collaboration intensity (TLS = 27), reflecting the strong focus on large family size, fertility, and educational participation in developing contexts. China also plays an important role, with 32 documents and a high collaboration strength (TLS = 22), followed by England, which records 19 documents and 1231 citations, indicating high scholarly impact.

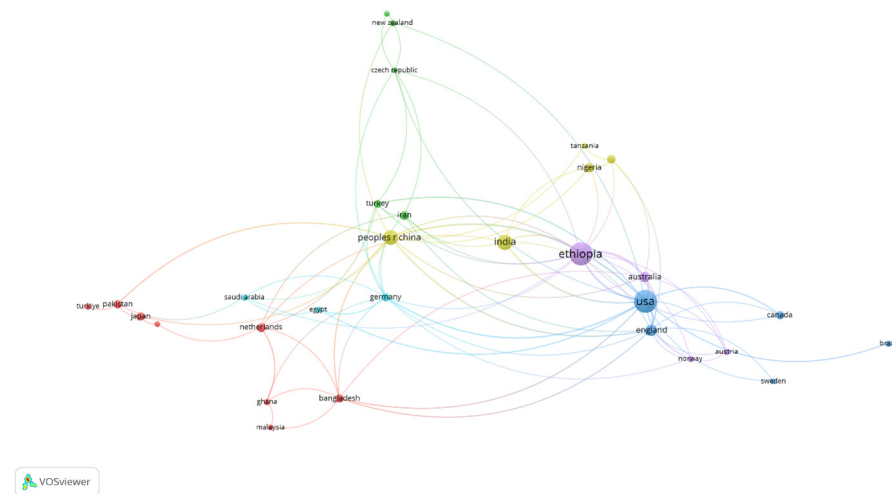


Figure 3. Geographic distribution of studies, by country. Source: Authors' processing in VOSviewer, using Web of Science-indexed articles.

India represents another key contributor, with 35 documents and 299 citations, highlighting research addressing demographic pressure and educational inequality. Australia (15 documents; TLS = 18) and Germany (10 documents; TLS = 15) also demonstrate strong international collaboration patterns. Additionally, countries such as Bangladesh (11 documents; TLS = 11), Nigeria (14 documents; TLS = 5), Pakistan (11 documents; TLS = 5), and South Africa (10 documents; TLS = 6) reflect the importance of research conducted in developing regions where large family structures are more prevalent.

European countries also contribute to the literature, including the Netherlands (12 documents; 459 citations), Austria (six documents; 229 citations), Norway (six documents; TLS = 6), Sweden (five documents), and the Czech Republic (five documents). These countries often collaborate with both developed and developing regions, forming bridges within the global research network.

Additional contributions are observed from countries such as Iran (13 documents; 317 citations), Turkey (9 documents; 318 citations), Japan (10 documents; 182 citations), Canada (11 documents; 208 citations), and Ghana (six documents; 238 citations), indicating the multidisciplinary and international nature of the field. Smaller but relevant contributions are also recorded for Malaysia, Vietnam, Indonesia, Tanzania, Brazil, and Saudi Arabia, reflecting emerging research interest in household size and educational inclusion.

3.4. Keyword Co-Occurrence Patterns

Using VOSviewer, the most frequently occurring and co-occurring keywords were mapped to identify conceptual relationships within the broader literature on educational participation, inequality, and inclusion-related processes in large family contexts. The visualization generated by VOSviewer (Figure 4) illustrates the structure of the research field.

Each node represents a keyword extracted from titles and abstracts, while node size reflects the number of occurrences across publications. The distance between nodes indicates conceptual proximity, and links represent co-occurrence relationships within the same documents.

The analysis was conducted using a minimum occurrence threshold of five, resulting in a network of the most relevant and recurrent terms. The most frequently occurring keywords include “education” (44 occurrences), “family-size” (43 occurrences), “participation” (38 occurrences), “impact” (36 occurrences), “determinants” (34 occurrences), “children” (32 occurrences), “women” (33 occurrences), “fertility” (29 occurrences), “gender” (26 occurrences), and “health” (24 occurrences). These high-frequency keywords indi-

cate that literature is primarily structured around educational outcomes, family structure, demographic factors, and socioeconomic influences.

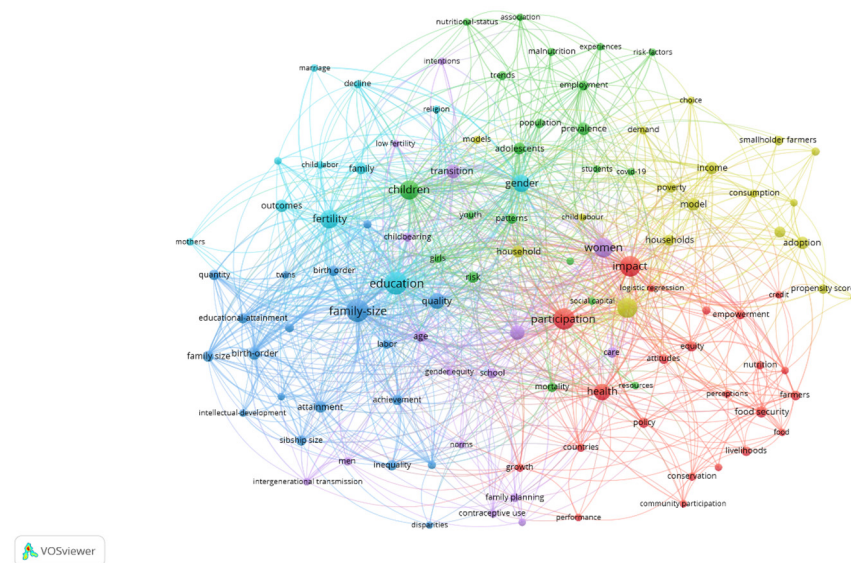


Figure 4. A map of keyword co-occurrences network and link strengths. Source: Authors' processing in VOSviewer, using Web of Sciences-indexed articles.

The network also highlights strong connections between education, family size, quality, achievement, educational attainment, and participation, suggesting that research predominantly examines large family contexts in relation to learning outcomes and educational inclusion. Additionally, keywords such as “income”, “poverty”, “inequality”, “resources”, and “equity” appear closely linked, reflecting the emphasis on socioeconomic factors influencing educational participation in large families.

Another set of frequently co-occurring keywords includes “fertility”, “women”, “gender”, “household”, and “children”, indicating the importance of demographic and family composition variables in the literature. These terms frequently co-occur with education-related keywords, suggesting that family structure is examined as a determinant of educational opportunities and participation.

The strength of relationships between keywords is measured using Total Link Strength (TLS). TLS indicates the cumulative strength of co-occurrence links between a given keyword and all other keywords in the network. A higher TLS value reflects stronger conceptual integration and more frequent co-occurrence with other terms. For example, family-size (TLS = 198), education (TLS = 184), participation (TLS = 124), and impact (TLS = 127) exhibit high TLS values, indicating that these keywords play central roles in connecting multiple research themes within the literature.

Country names and geographic identifiers were excluded from the keyword analysis to prevent geographic bias and ensure that the co-occurrence network reflects conceptual relationships rather than regional publication patterns. This approach improves the interpretability of thematic connections and enhances the clarity of conceptual mapping.

3.5. Thematic Clusters

The keyword co-occurrence analysis performed using VOSviewer identified six thematic clusters (C1–C6), reflecting the conceptual structure of research on large family contexts and inclusive education. These clusters group keywords based on co-occurrence frequency and Total Link Strength (TLS), indicating closely related research themes. The clusters illustrate the multidimensional nature of the literature, linking socioeconomic conditions, child development, demographic dynamics, and educational outcomes.

3.5.1. C1 (Red)—Socioeconomic Participation and Household Wellbeing

This cluster is characterized by the co-occurrence of keywords such as “participation” (38 occurrences; TLS = 124), “impact” (36; TLS = 127), “health” (24; TLS = 65), “food security” (11; TLS = 24), “policy” (10; TLS = 31), and “equity” (9; TLS = 20). Additional related terms include “livelihoods”, “empowerment”, “nutrition”, “access”, and “community participation”. From a bibliometric perspective, these patterns indicate that the literature grouped within this cluster frequently co-locates discussions of household wellbeing, resource conditions, and socioeconomic participation with broader development and education-related outcomes.

In terms of thematic interpretation, studies in this area emphasize that socioeconomic inequality affects school participation and access to education (Tansel, 1997, 2002). Similarly, research addressing rural–urban disparities indicates that household living conditions and community resources shape educational opportunities (Hannum & Wang, 2006; Knight & Shi, 1996). Additional studies highlight the role of food security and household wellbeing in shaping children’s educational participation (Alderman et al., 2006; Glewwe & Jacoby, 2004). These findings reflect a research area in which socioeconomic participation and household wellbeing represent indirect determinants of inclusive education, particularly in large family contexts where resources must be distributed among multiple children.

3.5.2. C2 (Green)—Child Vulnerability and Developmental Risks

The most frequent keywords include “children” (32 occurrences; TLS = 102), “prevalence” (13; TLS = 34), “adolescents” (12; TLS = 47), “risk” (11; TLS = 35), and “patterns” (9; TLS = 29). Additional associated terms such as “malnutrition”, “mortality”, “youth”, “resources”, “social capital”, and “students” further characterize this cluster. In terms of the bibliometric mapping, these co-occurrence patterns indicate that the cluster is centered on literature linking child-related topics with health, wellbeing, and developmental conditions. The prominence of health- and risk-related terminology could indicate that children in large family contexts are often examined in relation to vulnerability and limited resource availability.

From a thematic interpretation standpoint, studies in this cluster show that child vulnerability is associated with limited access to schooling and increased educational risk (Filmer, 2008; Glewwe & Jacoby, 2004). Research on child labor highlights that economic pressures in large households influence school enrollment (Basu & Van, 1998; Emerson & Souza, 2003). Additional studies indicate that health and nutritional risks significantly affect learning outcomes and participation (Alderman et al., 2006; Grantham-McGregor et al., 2007). Furthermore, research on sibship size and adolescent transitions suggests that children in larger families may face reduced educational investment and increased developmental risks (Desai, 1995; Lloyd, 1994). These findings highlight vulnerability-related barriers affecting inclusive education.

3.5.3. C3 (Blue)—Family Size and Educational Achievement

The dominant keywords include “family-size” (43 occurrences; TLS = 198), “quality” (21; TLS = 96), “birth-order” (13; TLS = 75), “attainment” (12; TLS = 53), “family size” (11; TLS = 47), and “achievement” (10; TLS = 30). Additional related keywords include “inequality”, “educational attainment”, “sibship size”, “quantity”, “investment”, and “children’s education”. According to the co-occurrence results, this cluster groups together literature in which family-size-related keywords appear alongside education- and outcome-related concepts.

In terms of thematic interpretation, research in this cluster consistently examines the resource dilution hypothesis and parental investment mechanisms. Studies show that

larger families are associated with lower educational attainment due to reduced parental resources (Blake, 1981; Downey, 1995). Similarly, research on birth order demonstrates differences in educational achievement within large families (Black et al., 2005; Booth & Kee, 2009). Additional studies using instrumental variables and twin designs confirm the causal impact of family size on education (Angrist et al., 2010; Rosenzweig & Wolpin, 1980). Research also highlights the trade-off between quantity and quality of children in family investment decisions (Becker & Lewis, 1973; Becker & Tomes, 1986). These studies form the conceptual nucleus linking large family contexts with educational inclusion.

3.5.4. C4 (Blue)—Household Economic Constraints and Child Outcomes

Keywords include “determinants” (34 occurrences; TLS = 101), “income” (13; TLS = 36), “household” (12; TLS = 31), “households” (11; TLS = 25), “market participation” (11; TLS = 17), and “poverty” (9; TLS = 28). Additional terms such as “child labor”, “consumption”, “demand”, “adoption”, and “empirical evidence” further characterize this cluster. As indicated by the co-occurrence structure, this cluster groups research highlights economic determinants affecting family conditions and children’s development.

In terms of thematic reading, research in this cluster emphasizes that household income significantly influences schooling decisions (Becker & Tomes, 1986; Haveman & Wolfe, 1995). Studies on poverty and education show that economic disadvantage reduces school participation and increases inequality (Filmer & Pritchett, 1999; Glewwe & Jacoby, 2004). Research on child labor further demonstrates that economic pressure in large families may reduce educational participation (Basu & Van, 1998; Emerson & Souza, 2003). Additional studies examining household consumption and educational investment highlight the role of economic constraints in shaping schooling outcomes (Knight & Shi, 1996; Lloyd, 1994).

3.5.5. C5 (Violet)—Fertility Behavior and Gender Dynamics

The most prominent keywords include “women” (33 occurrences; TLS = 114), “behavior” (19; TLS = 78), “transition” (17; TLS = 63), “age” (11; TLS = 52), and “care” (9; TLS = 22). Additional related terms include “childbearing”, “family planning”, “contraceptive use”, “gender equity”, and “intergenerational transmission”. From the network analysis results, this cluster reflects research examining reproductive behavior, gender roles, and demographic transitions. These themes are closely linked to family size dynamics and household structure.

Within the thematic framework, research in this cluster examines demographic determinants influencing family size. Studies on fertility transitions highlight how demographic change shapes family size and educational investment (Becker, 1991; Bongaarts, 2003). Research also highlights that gender roles influence fertility decisions and household structure (Caldwell, 1982; Mason, 1986). Additional studies examining intergenerational transmission demonstrate that parental education and fertility behavior influence children’s outcomes (Behrman & Taubman, 1986; Schultz, 2001).

3.5.6. C6 (Turquoise)—Education, Fertility, and Gender-Related Outcomes

The dominant keywords include “education” (44 occurrences; TLS = 184), “fertility” (29; TLS = 126), “gender” (26; TLS = 95), and “outcomes” (13; TLS = 45). Additional terms such as “family”, “marriage”, “mothers”, and “religion” further characterize this cluster. As indicated by the co-occurrence structure, this cluster highlights the interaction between demographic characteristics and educational outcomes, indicating that family size and gender roles are frequently examined together in relation to education.

From the perspective of thematic interpretation, research in this cluster examines the interaction between demographic factors and educational participation. Studies show that fertility decline is associated with increased educational attainment (Becker et al.,

1990; Hanushek, 1992). Similarly, research highlights gender differences in education linked to family size and parental investment (King et al., 1993; Schultz, 2001). Additional studies examining family background and schooling demonstrate the relationship between demographic characteristics and educational outcomes (Haveman & Wolfe, 1995; Lloyd, 1994). These findings suggest that demographic and gender-related factors are frequently associated with educational participation, inequality, and inclusion-related themes within the literature.

Overall, the six clusters reveal a structured research landscape. The third cluster represents the central focus on family size and educational achievement, while clusters one, two, and four highlight socioeconomic and developmental constraints influencing educational participation. Clusters five and six provide demographic and gender-related contexts, shaping family size and educational outcomes. Together, these clusters illustrate the multidimensional way in which large family contexts are represented across the literature addressing educational participation, inequality, and inclusion-related processes.

4. Discussion

4.1. Interpretation of Bibliometric Findings

The discussion is structured around the six research objectives (RO1–RO6), showing how each stage of the bibliometric analysis contributes to understanding the relationship between large family contexts, educational inequality, and inclusion-related processes. The findings reveal a multidisciplinary research landscape in which large family contexts are primarily examined through studies of educational participation and inequality. Although relatively few publications explicitly focus on inclusive education, the broader evidence provides important insights into the structural and contextual factors that influence educational inclusion. It is important to note that the thematic clusters identified through keyword co-occurrence analysis do not demonstrate causal relationships. Rather, they reflect patterns of thematic proximity and recurring associations within the literature. The interpretations presented below should therefore be considered exploratory and analytical rather than causal.

Addressing RO1–RO3, the bibliometric findings reveal the temporal evolution of the field, the geographical distribution of research, and the main thematic structures emerging from the literature. The observed increase in publications after 2016 suggests that large family contexts have gained recognition as an important component of broader debates on educational inequality and inclusion-related processes. Rather than representing the emergence of a distinct research field, this trend reflects the growing integration of demographic, socioeconomic, and educational perspectives within interdisciplinary research. Similar trends have been documented in studies examining the relationship between family structure and educational outcomes, emphasizing the importance of socioeconomic and demographic determinants (Bredtmann & Smith, 2018; Lehti et al., 2019; Yang & Qiu, 2016).

The thematic structure identified through keyword co-occurrence analysis demonstrates that research on large family contexts is predominantly framed through structural and socioeconomic perspectives. This finding suggests that educational inclusion is most frequently examined as a consequence of broader demographic and economic processes rather than as an isolated pedagogical issue. The centrality of the “family size” cluster indicates its importance within the conceptual structure of the literature, particularly in relation to resource allocation, educational attainment, and inequality. Previous empirical studies emphasize that family size influences educational achievement through socioeconomic mechanisms and parental investment patterns (Bredtmann & Smith, 2018; Gao et al., 2024).

The geographical distribution of research further suggests that scholarly interest is shaped by demographic relevance and socioeconomic challenges. The prominence of both

developed and developing countries (United States, England, China, India, and Ethiopia) indicates that the relationship between family size and educational outcomes represents a global concern, although the underlying mechanisms differ across national contexts. This difference is also reflected in the existing empirical literature. Studies conducted in developing contexts frequently emphasize the impact of family size on educational participation and resource distribution (Gao et al., 2024; Yang & Qiu, 2016), whereas European research places greater emphasis on family background, social capital, and educational mobility (Lehti et al., 2019). These contrasting perspectives suggest that the influence of large family contexts on education is shaped by broader socioeconomic and institutional conditions rather than by family size alone.

Overall, the bibliometric results suggest that the literature addressing large family contexts, educational inequality, and inclusion-related processes is strongly associated with socioeconomic conditions, demographic dynamics, and family structure. The following interpretations are based on the thematic reading of keyword co-occurrence clusters identified through bibliometric analysis. Accordingly, concepts such as “barriers”, “enabling factors”, and “resilience” should be understood as analytical interpretations derived from the literature associated with the clusters rather than direct causal relationships demonstrated by the bibliometric mapping itself.

4.2. Barriers Associated with Large Family Contexts in Inclusive Education

Addressing RO4, the thematic interpretation of the bibliometric clusters builds upon the bibliometric findings to identify several structural mechanisms that repeatedly emerge in the broader interdisciplinary literature as potential barriers to educational participation and inclusion in large family contexts. These interpretations are derived from the broader interdisciplinary literature and should not be understood as representing the inclusive education field exclusively. Cluster 1 (socioeconomic participation), Cluster 2 (child vulnerability), and Cluster 4 (household economic constraints) may be interpreted as reflecting barriers. Together, these clusters highlight structural disadvantages associated with large family size.

Socioeconomic inequality emerges as one of the most prominent barriers. Cluster 1 includes keywords such as “participation”, “equity”, “health”, “food security”, and “livelihoods”, indicating that educational participation is strongly influenced by household conditions. Research indicates that children from large families are disproportionately affected by socioeconomic inequality, particularly when parental education and household income are limited (Bredtmann & Smith, 2018; Gao et al., 2024). These families often lack financial resources for quality education, extracurricular activities, and individualized support, resulting in cumulative disadvantages (Yang & Qiu, 2016). Socioeconomic disparities also reduce access to inclusive education programs, particularly in disadvantaged regions (Skyba et al., 2020).

Resource dilution represents another major barrier, strongly linked to Cluster 3 but also interacting with Clusters 1 and 4. As family size increases, parental resources must be divided among multiple children, reducing individual educational investment. Studies indicate that children in large families receive less parental attention and fewer educational resources, negatively affecting school performance and inclusion (Bredtmann & Smith, 2018; Gao et al., 2024). The dilution of resources also limits access to tutoring, educational materials, and specialized support services, particularly in low-income households (Yang & Qiu, 2016).

Limited parental support is closely connected to Cluster 2, which emphasizes child vulnerability. Large families often experience reduced parental involvement due to competing demands across multiple children. This may affect children’s readiness for inclusive

education and reduce family–school collaboration. Research highlights that parental engagement is essential for inclusive education, yet large families often struggle to maintain consistent support (Gao et al., 2024; Skyba et al., 2020). Reduced parental advocacy may also limit access to inclusive educational opportunities.

Educational access barriers are also reflected in Cluster 4, which includes keywords such as “poverty”, “income”, and “household”. Children from large families are more likely to attend under-resourced schools and experience financial barriers to education. These barriers include school-related costs, transportation difficulties, and limited access to specialized services. Empirical studies show that large family size is associated with lower educational attainment and reduced inclusion, particularly in disadvantaged contexts (Bredtmann & Smith, 2018; Gao et al., 2024; Yang & Qiu, 2016). Overall, these barriers correspond to the “shadows” identified in the bibliometric clusters. Clusters 1, 2, and 4 collectively illustrate that socioeconomic inequality, resource dilution, reduced parental support, and limited educational access create structural disadvantages affecting inclusive education in large family contexts.

4.3. *Enabling Factors Supporting Inclusive Education in Large Families*

Addressing RO5, the bibliometric analysis identifies several thematic patterns that can be interpreted as enabling factors associated with inclusive education in large family contexts. These are mainly reflected in Cluster 2 (social capital and children), Cluster 5 (family dynamics), and Cluster 6 (education and gender outcomes), illustrating positive mechanisms that may foster inclusion.

Sibling learning represents an important enabling factor. Large families provide opportunities for peer learning, mentoring, and academic support among siblings. Older siblings may assist younger children with homework, social integration, and school adaptation. Research suggests that sibling cooperation can compensate for limited parental support and enhance educational outcomes (Fernández, 2006; Lehti et al., 2019). These dynamics are reflected in Cluster 2 keywords such as “children”, “social capital”, and “resources”.

Family social capital also emerges as a key enabling factor. Strong relationships within extended families can provide additional educational support, emotional resources, and guidance. Studies indicate that grandparents and extended family members may contribute to educational achievement and inclusion, particularly in large households (Lehti et al., 2019). This aligns with Cluster 5, which includes women, family planning, care, and intergenerational transmission, highlighting family dynamics influencing educational outcomes.

Community support represents another enabling factor. Engagement with schools and local organizations can provide resources and information for large families. Community participation may reduce barriers related to socioeconomic inequality and resource dilution. Research indicates that school–family cooperation enhances inclusive education and improves participation in large families (Bah & Kagotho, 2024; Skyba et al., 2020). These findings correspond to Cluster 1 and Cluster 6, which include participation, education, and outcomes.

Resilience and adaptive family strategies also contribute to inclusive education. Some studies suggest that large families develop cooperative learning environments and shared responsibilities that support educational engagement (Fernández, 2006; Lehti et al., 2019). These dynamics may enhance motivation, peer learning, and social integration, particularly in inclusive settings.

Overall, these thematic associations were interpreted by the authors as corresponding to the “lights” identified within the bibliometric clusters. Clusters 2, 5, and 6 highlight sibling support, family social capital, community engagement, and resilience as mechanisms that may enhance inclusive education in large family contexts. While barriers dominate

the literature, these opportunities suggest that large families may also provide supportive learning environments when adequate social and community resources are available.

4.4. Conceptual Framework: *Lights and Shadows of Inclusive Education in Large Family Contexts*

Finally, addressing RO6, the bibliometric findings support the development of a conceptual framework while highlighting research gaps and future directions for understanding inclusive education in large family contexts. After analyzing the results, the analysis revealed several analytically significant patterns.

First, identifying the six thematic clusters contributes to a broader understanding of the research areas associated with large family contexts, including socioeconomic participation, household economic constraints, fertility behavior, and gender dynamics, with particular attention to education and child development. The results revealed that there are some specific elements inside each cluster—some of them considered by the authors as “lights” (L)—factors that enable inclusive education for children from large families, and others classified as “shadows”—representing barriers to the education and development of children from large families. Furthermore, the analysis highlighted several recurrent keywords characterizing the clusters, including “financial resources”, “disadvantaged regions”, “low income”, “sibship”, “limited access”, “inclusive education”, “participation”, and “motivation”. These terms reflect the core dimensions through which large family contexts influence educational trajectories.

Considering all these aspects, a conceptual framework can be developed (Figure 5). The main idea of this framework is to take into consideration the findings as “lights and shadows of education” for children from large families and to highlight the main implications of these elements on children’s education. The “lights and shadows” framework should be understood as an interpretative analytical model derived from the thematic reading of the bibliometric clusters and the associated literature. The classification of factors as “lights” or “shadows” does not imply fixed or universal categories; rather, these dimensions reflect potentially enabling or constraining mechanisms discussed within the literature. Their influence may vary according to socioeconomic context, cultural norms, gender dynamics, and the availability of institutional or school support.

As shown in Figure 5, the analysis identifies several factors that may influence the inclusive education of children from large families. The findings suggest that, according to the literature associated with the clusters, three broad types of thematic configurations can be distinguished: clusters containing both enabling and constraining dimensions (“light grey” clusters), clusters predominantly associated with constraining dimensions (“dark grey” clusters), and clusters predominantly associated with enabling dimensions (“white” clusters). This does not necessarily imply that the analyzed elements are determined exclusively by a single type of influence; rather, the literature currently emphasizes one type of relationship more prominently. At the same time, this observation also points to an important research gap, suggesting the need for future studies to explore the dual and potentially context-dependent nature of these influences.

Also, the analysis pinpoints the fact that some of the factors revealed in the literature can be found in more than one cluster. This overlap suggests that assessing the influence of these factors on inclusive education of children from large families is a result of a wide range of factors with an impact on different aspects of education. This idea is supported by C6 itself, as it is the result of integrating some of the most important analyzed elements.

These findings underline that the educational experiences of children from large families are shaped by a dynamic balance between enabling and constraining forces. The findings should therefore be interpreted within a broader interdisciplinary framework situated at the intersection of family size, educational participation, inequality, and inclusion-

related processes, rather than as a representation of the inclusive education field in its strict pedagogical sense. The study may provide useful insights for policymakers, educational institutions, and organizations addressing family-related educational inequalities.

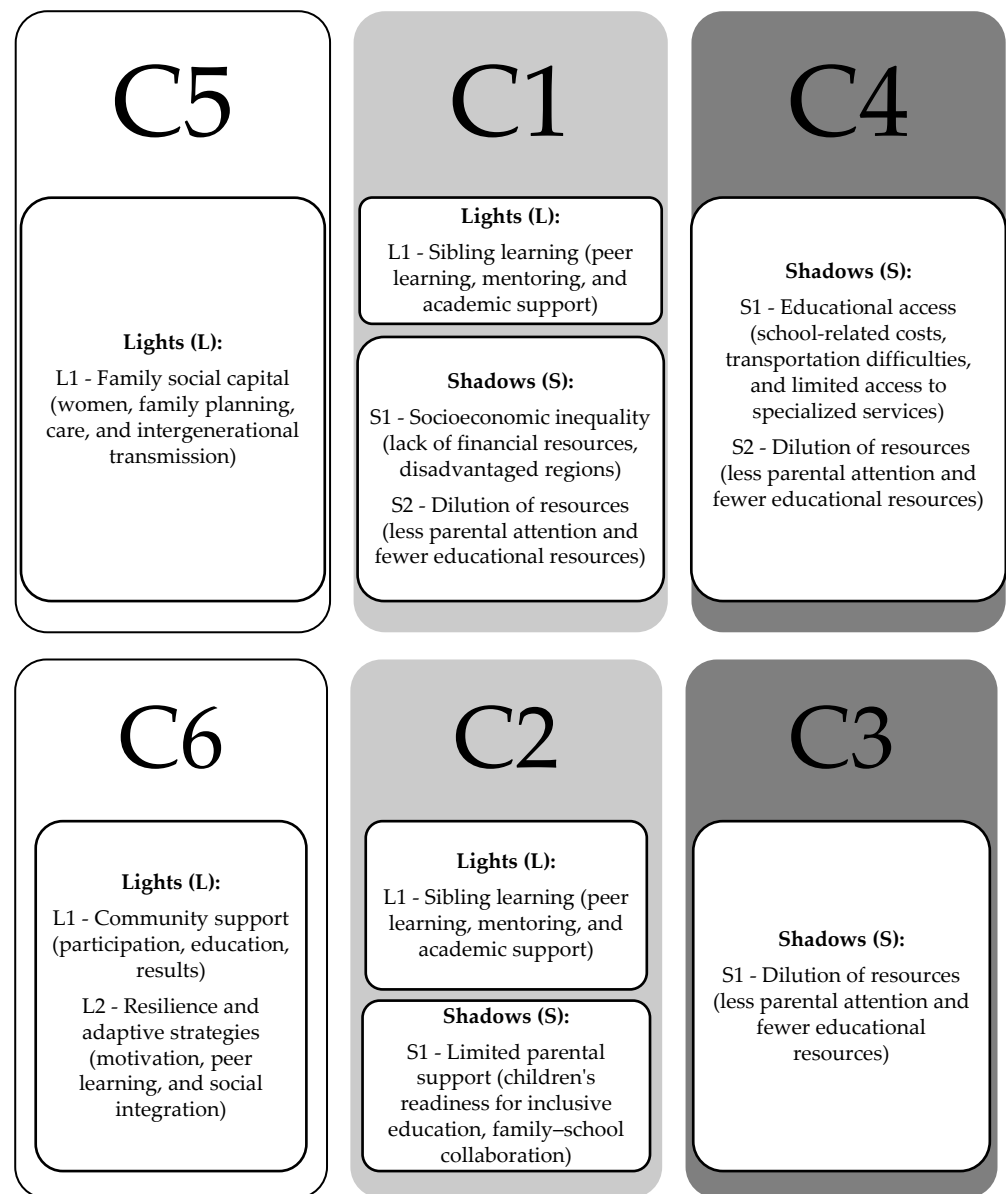


Figure 5. Literature-based conceptual framework of enabling (“lights”) and constraining (“shadows”) factors influencing inclusive education in large families. Source: authors’ processing.

4.5. Limitations of the Study

This study has several limitations that should be considered. First, the bibliometric dataset is based exclusively on the Web of Science Core Collection. While this database is widely used in bibliometric research due to its indexing standards and citation tracking consistency, its exclusive use may have influenced the composition of the dataset. Relevant studies indexed in alternative databases such as Scopus, ERIC, or Dimensions may not be fully represented.

Second, bibliometric methods are inherently descriptive and structural in nature. While they are well suited for identifying publication trends, co-occurrence patterns, and thematic clusters, they do not directly assess the substantive quality, methodological rigor, or causal validity of the included studies. Accordingly, the interpretations offered in this

study should be understood as mappings of the intellectual structure of the field rather than evaluations of empirical evidence or educational effectiveness.

Third, although the study incorporates a clarified operational framework distinguishing between large family, family size, sibship size, and birth order, terminological variability across disciplines may still affect how these constructs are represented and retrieved in the bibliometric corpus. Fourth, the interdisciplinary nature of the topic means that relevant literature is distributed across educational, sociological, demographic, and inequality research domains. As a result, some conceptual fragmentation is inevitable, and certain thematic connections may not be fully captured within a single bibliometric mapping approach.

Finally, the study focuses on published, indexed journal literature and therefore excludes policy reports, and non-indexed sources, which may also contribute relevant perspectives on family structure and educational inequality.

5. Conclusions

Although inclusive education has traditionally focused on disability, access, and school participation, contemporary scholarship increasingly conceptualizes inclusion as a multi-dimensional and context-sensitive process shaped by broader structural inequalities and social conditions. Scholars have emphasized that inclusive education cannot be understood solely through classroom practices or individual learner characteristics but must also consider the systemic and contextual factors that shape educational participation and exclusion. Positioned within this broader interdisciplinary perspective, the present study does not treat family size as a causal determinant of inclusion, but rather as a socio-demographic contextual variable whose representation within literature addressing educational inequality and inclusion-related processes remains insufficiently explored from a bibliometric perspective. Consistent with the bibliometric nature of the study, the findings should be interpreted as reflecting thematic patterns and conceptual associations within literature rather than demonstrating causal relationships between family size and educational outcomes.

5.1. Conclusions in Relation to Research Objectives

The present study set out to systematically examine the literature on inclusive education in large family contexts through a bibliometric and thematic approach, guided by six research objectives (RO1–RO6). The findings provide a coherent and integrated response to these objectives, while also advancing the conceptual understanding of how family size is represented within literature addressing educational inclusion and inequality.

With respect to RO1, the analysis of temporal evolution reveals a clear and accelerating growth trajectory of the field, particularly after 2016, suggesting that research on large family contexts has become increasingly visible within discussions of educational inequality and inclusion. This upward trend, supported by increasing citation patterns, indicates both the consolidation and the rising influence of this research domain.

Addressing RO2, the study highlights a globally distributed yet uneven structure of scientific production, dominated by key contributors such as the United States, Ethiopia, China, and England. This distribution reflects the dual relevance of the topic across both developed and developing contexts, where issues related to demographic pressure, socioeconomic inequality, and educational participation are particularly salient. The strong international collaboration patterns further emphasize the multidisciplinary and cross-regional nature of the field.

In relation to RO3, the keyword co-occurrence and clustering analysis identified six major thematic clusters (C1–C6), which collectively define the intellectual structure of the literature. Among these, Cluster 3 emerges as the central thematic cluster, bringing together literature concerned with family structure, educational outcomes, resource allocation, and

parental investment. This central cluster is closely interconnected with Cluster 1 (socioeconomic participation), Cluster 2 (child vulnerability), and Cluster 4 (household economic constraints), which together explain the structural barriers influencing educational access and participation. At the same time, Cluster 5 (fertility behavior and gender dynamics) and Cluster 6 (education–fertility–gender outcomes) provide a broader demographic and sociocultural context, highlighting the underlying determinants of family size and their indirect effects on education.

Regarding RO4, the findings suggest that literature frequently discusses multiple and interrelated barriers associated with large family contexts reflected in Clusters 1, 2, and 4. These include socioeconomic inequality, resource dilution, limited parental support, and restricted access to educational opportunities. The interaction between these clusters suggests that educational disadvantage is not the result of a single factor but rather emerges from a cumulative system of structural constraints that disproportionately affect children in large households.

In contrast, the analysis addressing RO5 identifies several enabling factors that can support inclusive education, particularly within Clusters 2, 5, and 6. These include sibling support, family social capital, community engagement, and adaptive family strategies, which can partially offset structural disadvantages. The coexistence of these enabling mechanisms alongside the identified barriers highlights the dual nature of large family contexts, where both risks and opportunities shape educational outcomes.

Finally, in line with RO6, the study identifies important research gaps and future directions. Notably, the analysis reveals an imbalance in the literature, with a stronger focus on constraints (Clusters 1–4) compared to enabling mechanisms (Clusters 5–6). Additionally, the overlap of factors across clusters suggests the need for more integrative and context-sensitive research designs capable of capturing the dynamic and multidimensional nature of inclusive education in large families. Future studies should therefore explore the conditional and context-dependent effects of these factors, as well as their interactions across different socioeconomic and cultural settings.

By integrating bibliometric mapping with thematic analysis, this study contributes to clarifying a fragmented research field and advancing a more nuanced understanding of inclusive education in large family contexts. The proposed “lights and shadows” framework synthesizes the evidence by linking structural barriers predominantly associated with Clusters 1–4 to enabling mechanisms emerging from Clusters 2, 5, and 6, thereby offering a comprehensive perspective on how family size shapes educational inclusion through both constraints and opportunities.

At the same time, the research findings highlighted that inclusive education in the large family context must be approached in a multidisciplinary perspective, related to part of our objectives. Evidence of multiple fields align with influential ideas (RO2), thematic clusters (RO3), educational barriers (RO4), enabling factors (RO5) and future research directions (RO6).

5.2. Practical Implications

Given the bibliometric nature of this study, the following implications should be interpreted as literature-informed considerations that may help identify research and policy priorities rather than as evidence-based recommendations for educational interventions. The findings provide important implications for policy and practice, particularly when interpreted through the lens of the six thematic clusters. First, the strong influence of Cluster 1 (socioeconomic participation) and Cluster 4 (household economic constraints) highlights the importance of equity-oriented approaches to educational resource allocation that are responsive to differences in household circumstances, including family size and household

vulnerability, and the distribution of resources within households. Rather than implying individualized funding mechanisms, these findings support broader policy discussions emphasizing the need for differentiated and context-sensitive support in education systems. In this regard, attention to family size is relevant not only in situations of poverty or vulnerability, but also in understanding how the cumulative educational, financial, and caregiving demands associated with larger households may shape children's educational participation and access to opportunities across diverse socioeconomic contexts.

Second, the prominence of Cluster 2 (child vulnerability and developmental risks) highlights the need to integrate inclusive education policies with public health and social protection systems. Since educational outcomes are closely linked to factors such as nutrition, health status, and developmental conditions, effective interventions could address these underlying vulnerabilities through coordinated, cross-sectoral strategies.

Third, the central role of Cluster 3 (family size and educational achievement) suggests that policy frameworks should address the mechanisms of resource dilution and unequal parental investment. This requires the development of targeted support programs, including access to tutoring, learning materials, and individualized educational services, aimed at compensating for reduced household-level educational investment in large families.

At the same time, the enabling dimensions identified in Cluster 5 (fertility behavior and gender dynamics) and Cluster 6 (education–fertility–gender outcomes) indicate that policy interventions should not focus exclusively on mitigating disadvantages but also on strengthening positive family and social dynamics. For instance, promoting gender equity, supporting parental education, and encouraging family planning awareness can indirectly contribute to improved educational outcomes.

Furthermore, the overlap between Clusters 2, 5, and 6 highlights the importance of leveraging intra-family and community resources, such as sibling learning, extended family support, and social capital. Policies could therefore adopt a more holistic and asset-based approach, recognizing that large families can also provide supportive environments for learning when adequate external support is available.

Finally, the global distribution of research across both developed and developing contexts suggests that all cluster-related mechanisms are highly context-dependent. As a result, policy responses should be tailored to specific socioeconomic and demographic conditions, ensuring that interventions addressing Clusters 1–4 (constraints) and Clusters 5–6 (enablers) are adapted to local realities.

5.3. Theoretical Implications

The findings of this study generate several important theoretical implications for the literature on inclusive education, family sociology, and educational inequality, particularly by advancing the understanding of large family contexts as a multidimensional and dynamic analytical construct. First, the study contributes to theory by repositioning family size from a unidimensional demographic variable to a complex, structurally embedded construct, as evidenced by its central placement within Cluster 3 (family size and educational achievement) and its strong interconnections with Clusters 1, 2, and 4. While traditional approaches, such as the resource dilution theory, primarily conceptualize family size as a constraint on educational outcomes, the present findings demonstrate that its effects are mediated through broader systems of socioeconomic participation (C1), household economic constraints (C4), and child vulnerability (C2).

Second, the study advances the literature by proposing a dual-mechanism framework (“lights and shadows”), which extends beyond dominant deficit-oriented models. Existing theoretical perspectives tend to emphasize negative outcomes associated with large families, particularly through mechanisms identified in Clusters 1–4. However, the integration of

Clusters 2, 5, and 6 highlights the presence of enabling mechanisms, such as sibling learning, family social capital, and gender-mediated educational dynamics. This duality introduces a bidirectional and non-linear conceptualization of educational outcomes, in which constraints and enablers coexist and interact. As a result, the study contributes to a more balanced theoretical perspective that incorporates both risk and resilience in large family contexts.

Third, the findings contribute to the theoretical integration of micro-, meso-, and macro-level perspectives. Specifically, Cluster 2 (child vulnerability) captures individual-level developmental risks, Clusters 1 and 4 reflect household and community-level socioeconomic structures, while Clusters 5 and 6 situate family size within broader demographic and sociocultural processes, including fertility behavior and gender dynamics. This multi-level structure supports the development of a systems-based theoretical model, in which inclusive education outcomes are produced through interactions across different analytical levels. Such an approach responds to ongoing calls in the literature for more integrative frameworks capable of bridging educational, demographic, and socioeconomic perspectives.

Fourth, the study refines the theoretical understanding of educational inequality by embedding it within demographic and family processes. The strong connections between Cluster 6 (education–fertility–gender outcomes) and the core educational clusters suggest that inequality in education cannot be fully explained without considering reproductive behavior, gender norms, and intergenerational dynamics. This expands existing theoretical models of educational inequality by incorporating demographic transition theory and gender-based frameworks as essential components in explaining variation in educational participation and achievement.

Fifth, the identification of overlapping factors across clusters provides evidence for the contextual and contingent nature of theoretical relationships. Several variables, such as socioeconomic status, gender, and family dynamics, appear across multiple clusters, indicating that their effects on inclusive education are not fixed but vary depending on contextual configurations. These findings challenge deterministic interpretations and support the development of configurational and context-sensitive theoretical approaches, such as those based on complexity theory or intersectionality.

Finally, the study contributes to theory by highlighting critical gaps in the existing literature, particularly the underrepresentation of enabling mechanisms (Clusters 5–6) relative to constraint-focused research (Clusters 1–4). This imbalance suggests that current theoretical frameworks may be overly skewed toward explaining disadvantages, while insufficiently accounting for adaptive strategies and resilience within large families. Addressing this gap requires the development of more integrative and dynamic theoretical models that capture both the constraints and opportunities shaping inclusive education.

5.4. Future of Research Trends

This bibliometric analysis revealed a series of elements that have an impact on education for children from large families as enablers or barriers for education. The findings lead to the main conclusion that literature is mainly focused on educational outcomes, family structure, demographics and socioeconomic aspects. At the same time, the analysis suggests some possible directions that could be explored in the future.

In the first place, the clusters' determinants could be extended, by approaching each thematic more in depth. In this way, a series of gaps in the literature could be filled with scientific information. More than this, following the integration of different elements (as Cluster 6 does) it could lead to a "multifaced" approach of inclusive education, by studying the impact of structural and environmental factors on the process. For instance, connecting the characteristics of C5 (fertility behavior and gender dynamics) with some of the cluster

C1 (socioeconomic characteristics and wellbeing) could provide a better understanding of how financial resources together with the disadvantaged regional contexts influence family size and the family dynamics.

Although the present study focused on publication trends, geographical distribution, collaboration patterns, and thematic structures, future bibliometric research could complement these findings by incorporating citation-based performance indicators, such as the identification of highly cited publications, influential authors, and source impact. Such analyses would provide additional insights into the intellectual structure and scientific influence of this interdisciplinary research field.

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Abbreviations

The following abbreviations are used in this manuscript:

C	Cluster
L	Light
RO	Research Objective
S	Shadow
TS	Topic field
TLS	Total Link Strength

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