

REVIEW

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Bibliometric trends in SMEs financial literacy research from 2021 to 2024

K. Devender^{1*}, Kafila¹, Gurunadham Goli¹ and M. Shravan¹

Abstract

In this study, the level of financial literacy among SMEs was examined through bibliometric and content analyses. Thoroughly analyzing and quantifying the literature on financial literacy and SMEs are the goal of bibliometric research. This comprehensive overview aims to pinpoint trends, research gaps, important authors, and key ideas in order to guide future studies and policy initiatives aimed at improving the financial literacy and welfare of small- and medium-sized enterprises (SMEs). A comprehensive search of articles was conducted in 2024 to extract data. The search utilized the Scopus database and included inclusion and exclusion criteria. A total of 195 articles published between 2021 and 2024 were identified. Key concepts, including "Global Financial Literacy," were discovered through the use of the Biblioshiny app and VOS viewer program, which allows for the visualization of networks involving keywords and bibliographic coupling. Topics include: "Empowerment through financial literacy: Overcoming the manacles of Domestic violence"; "SMEs Development and planning and preparedness"; "Addressing the gap in financial inclusion and personal finance behavior"; and "Addressing disparities and enhancing education." The following are potential areas for future research: the level of financial literacy among small- and medium-sized enterprises (SMEs) around the world, the effectiveness of targeted interventions to improve SMEs' financial literacy, the role of SMEs in domestic violence policies, the factors that influence SMEs' planning processes, and the promotion of global equality and financial well-being.

Keywords Financial literacy, SMEs, Financial inclusion, Bibliometric, Financial education

Introduction

For many small businesses, financial literacy and digital financial literacy are crucial to gaining access to financial inclusion [4]. We discovered compelling evidence of how digital adoption affects the financial literacy of MSE owners [2]. We found that financial literacy significantly increases the quality of financial advice sought, but has no effect on quantity. People who are better versed in personal finance are more likely to seek expert advice when needed [38]. Both financial education and financial socialization are significantly linked to financial literacy and access, which in turn are linked to good financial behavior and, conversely, to economic hardship [68].

Policymakers see financial literacy as a key instrument for raising household income and fostering economic growth [41]. Here, we examine the impact of financial literacy on households' capacity to meet their financial obligations [64]. Financial technology, or FinTech, has changed the delivery model of financial services and opened them to previously unbanked populations [29]. It examines how working SMEs' financial decision-making is influenced by their level of financial literacy, personal financial planning, and risk-taking [27] unveiled AI-powered banking features.

The prioritization of chatbot use cases on banking platforms is determined by customer experience [13]. Policymakers can use this study's recommendations on green investment, eco-innovation, and financial inclusion to improve sustainable development [18]. The utilization of financial advisors in the USA prior

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to and during the pandemic was largely influenced by the level of financial literacy among the general population. Those who were financially literate also tended to seek advice from financial experts [58], analyzed the role of financial institutions and investors' level of financial literacy in the COVID-19 pandemic investment decision-making process, and examined the efficacy of the theory of planned behavior (TPB) within this context [1]; the relationship between financial inclusion and economic growth has neglected the influence of religion or secularism [53] effect on the desire of consumers to continue using the service compared to consumers whose financial literacy is high [37]. Hubei Province is a link in the supply chain for small- and medium-sized enterprises. These effects had a domino effect on the supply chain, hitting small- and medium-sized enterprises (SMEs) in Hubei even harder [42]. Additionally, the authors demonstrate that innovation primarily improves existing products, which has a positive impact on firm performance [40], plays a part in achieving carbon neutrality through financial inclusion, and offers some significant policy implications. The environmental, economic, and social impacts of a regulatory climate conducive to growth can be immediately felt [14]. Our study takes into account both the intrinsic risk that SMEs generate and the relational risk that emanates from the publicly available risk events of nearby firms. This is in contrast with earlier research that primarily examined the intrinsic risk SMEs generate when assessing their credit risk [44]. A new paradigm for economic growth is financial inclusion, which is gaining traction in developing nations like India's. This is a crucial indicator of a nation's overall economic growth [57]. In order for people and companies to make the best decisions possible, financial literacy is seen as a crucial quality. Given the significance of financial literacy and the absence of comprehensive reviews in the current literature [59], both these drivers and income are moderated to a significant extent by financial literacy [10]. Sustainable financial inclusion is crucial for achieving energy efficiency. Therefore, it is vital for an economy to acquire low-carbon energy sources [21]. The findings of this study may have significant policy and practice implications for improving the overall goal and increasing financial literacy among SMEs.

Literature review

The purpose of this review of the literature is to investigate how eco-friendly technologies might support financial literacy in the quest for a sustainable future [14]. The integration of FinTech, green finance, and renewable energy solutions is reshaping economic opportunities across income groups, with the potential to

enhance financial inclusion for low-income communities, promote sustainable investments among middle-income earners, and drive innovation-led green growth for higher-income segments. [3]. "Digital financial literacy" is a relatively recent concept that emphasizes the significance of having the knowledge and experience to handle one's finances while doing transaction online [19]. Age-related declines in financial literacy seem to be a fairly constant trend. One of the most important predictors of someone's future financial success or failure is their capacity to comprehend and handle their own finances [7]. Long-term positive economic results are strongly correlated with financial literacy. The influence that prudent financial decision-making may have on the quality of life of autistic persons makes the paucity of study on their financial literacy concerning [26]. This research investigates the connection between FinTech and their capacity to get financial services, taking into account the moderating effect of perceived regulatory support and the mediating role of digital financial literacy [6]. By examining 64 developing countries between 2000 and 2020 and the potential effects of financial inclusion on their economies, we contribute to the vast body of research on the factors that propel industrialization [63]. We look at how markups and inflation in the supply are affected by devaluation and corporate bond financing for many Latin American countries [54]. Increasing people's ability to manage their own finances is the aim of financial education [62]. The middle class and those Americans without access to conventional banking services have benefited greatly from the emergence of financial technology firms [8]. Financial capability—the nexus of financial knowledge and financial access—has the potential to improve health and well-being by expanding people's access to resources [67]. While digital banking has expanded access to financial services and promoted financial inclusion, it has also heightened the risk of individuals—especially those with limited financial literacy—falling into debt traps due to easy access to credit and lack of proper financial management. As digital banking has increased the risk of financial inclusion, so too has the chance of people falling into a debt trap [73]. There is a correlation between Russian firms' financial success and the degree of digitization in their business operations [15]. Local banks and digital financial inclusion have played a critical role in easing funding limitations, particularly for underserved communities and small businesses, by providing more accessible and tailored financial services. [45]. In underdeveloped countries, literacy significantly influences financial inclusion, as the implementation of socially responsible practices relies on individuals' ability to understand and effectively engage with financial

systems and services. [70]. The increasing significance of individual financial responsibility and the relevance of financial literacy have led to an emphasis on financial literacy and educational initiatives in recent decades [31]. Tried and true survey methods are used to measure how financial knowledge, habits, and stress affect financial independence [56]. The performance and long-term worth of banks depend heavily on the quality of their corporate financial reporting [52]. There is a connection between the financial literacy and personal financial well-being of business school teachers [43]. Both broad developments in the green finance sector and variations in market circumstances between nations may account for this variance [61]. Financial literacy may indirectly enhance customer's ability to monitor and evaluate bank performance and risk-taking. Therefore, bank executives reconsider their actions before seizing chances to inflate their earnings. A stronger inclination to accumulate savings and investment goods as their financial literacy increases. Therefore, effective policies need to be developed [35].

Proposed Bibliometric Equation.

$$IFLi = \alpha + \beta_1 TC_i + \beta_2 CC_i + \beta_3 AC_i + \beta_4 DC_i + \beta_5 KA_i + \epsilon_i$$

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Explanation of Variables:

- $IFLi$ = Impact on financial literacy research for SME (measured through citations, publication count, or another relevant metric).
- TC_i = Total citations of publication i (a measure of influence).
- CC_i = Co-citation frequency (showing interconnections between studies).
- AC_i = Author collaboration index (indicating co-authorship trends).
- DC_i = Document count (number of papers published per year).
- KA_i = Keyword analysis score (based on VOS viewer clustering of key research themes).
- Rationale:

This equation integrates bibliometric indicators commonly used to measure research impact. It aligns with bibliometric methodologies, ensuring empirical robustness. The inclusion of keyword analysis (KA_i) and co-citation frequency (CC_i) allows tracking thematic evolution in SME financial literacy research.

Self-efficacy in handling financial resources can help with financial literacy. In summary, this study examines how socioeconomic factors affect small- and

medium-sized businesses' (SME's) financial literacy while accounting for individual differences in financial literacy. Future studies should concentrate on enhancing focused financial education initiatives, figuring out how financial behavior is influenced by financial literacy, and examining the long-term consequences of higher financial literacy on SMEs financial stability. In order to close the gap in financial inclusion and enhance retirement planning outcomes, governments and policymakers should give priority to financial education and initiatives that address the particular needs of small- and medium-sized business (SMEs), particularly those in the sector. These initiatives build on the academic discussion of (SMEs) financial literacy from a thematic perspective.

Methodology

This study's methodology is sound; it uses VOS viewer and bibliometric analysis to look for patterns in the occurrence of words in a corpus of text. A thorough review of published literature is made possible by bibliometric analysis, which offers important insights into the composition, evolution, and significance of research in the selected field. Descriptive analysis, statistical summaries, and quantitative evaluations of different bibliographic components are made easier by this tool. In order to answer Research Questions 1 (RQ1) and 2 (RQ2), it also facilitates the identification of authors and sources, the investigation of publication trends, and the analysis of bibliometric patterns. To examine the body of knowledge and discussion regarding financial literacy in SMEs, we performed a bibliometric analysis [24]. This study uses a bibliometric analysis methodology, gathering data from the Scopus Google Scholar database using Publish or Perish software [51], bibliographic data and calculates topic clusters, co-authorship relationships, and citation trends [32]. We were able to examine the bibliometric data, better understand the state of financial literacy research in the banking sector, and spot patterns and gaps in the existing body of literature by using VOS viewer and Biblioshiny [50]. To thoroughly review the pertinent literature and look into the connection between risk tolerance, investment decisions, and financial literacy, this study uses bibliometric analysis. The methodology is therefore sound a corpus of text by looking at word occurrence patterns. This tool can be used for descriptive analysis, statistical summaries, quantitative insights, author and source identification, publication trend exploration, and bibliometric pattern analysis (RQ1 and RQ2). In addition, VOS viewer offers helpful network visualization and the ability to analyze bibliographic coupling (RQ3 and RQ4). Powerful network visualizations are where the network shines. Elements that facilitate understanding include

clustering analysis, collaboration analysis, and extensive summarization capabilities as well as connections and thematic clusters. Consequently, the methodological instruments of bibliometrics and VOS viewer were employed in conjunction to achieve the research objectives.

VOS viewer improves the research by providing sophisticated network visualization features in addition to conventional bibliometric techniques. When it comes to mapping and examining the connections between important research components like authors, institutions, keywords, and sources, this tool is especially useful. In order to answer Research Questions 3 (RQ3) and 4 (RQ4), VOS viewer assists in identifying significant works and new research trends through bibliographic coupling and co-citation analysis. By utilizing these methods, the research can offer a more comprehensive comprehension of the field's intellectual underpinnings, scholarly collaborations, and thematic structures. Through the integration of bibliometric techniques and visualization tools from VOS viewer, this study takes a thorough and methodical approach to literature analysis. By combining these approaches, the research landscape is rigorously explored and important patterns, relationships, and knowledge structures within the chosen domain can be thoroughly examined.

This study seeks to answer the following research questions (RQs):

RQ1. What are the publication trends, most prominent sources, documents, and authors regarding SMEs' financial literacy?

RQ2. What are the major contributing institutions and countries that yield research related to SMEs' financial literacy?

RQ3. What are the major themes in the financial literacy of SMEs?

RQ4. What are the potential future areas of research on the financial literacy of SMEs?

The proceeding section delineates data extraction and analysis.

Data extraction, inclusion, and exclusion criteria

A methodical approach was used to create precise inclusion and exclusion criteria in order to guarantee that only relevant, high-quality journals and articles were included in the data taken from Scopus. This process determines how reliable the research findings are [30]. In 2024, we began by searching Scopus for articles that used the following keywords: "Financial literacy" OR "SMEs" OR "Financial Inclusion" in the title, abstract, or list of keywords. We found 5,522,22 scholarly studies. Articles published between 2021 and 2024 were the only ones retained after filtering. The outcome comprised 20,327

scholarly publications. Applying stringent inclusion and exclusion criteria to the field of "Economic and Finance" reduced the pool of potential results to 6099 academic publications. Subsequently, we narrowed our search to include only articles (document type "Articles"). This allowed us to identify 4539 scholarly works. The results were further refined by choosing the publication stage as "Final," which led to the identification of 4,192 scholarly works. After conducting a topic search using the following keywords: "Financial literacy, SMEs, Financial inclusion, Financial education, Finance," a total of 2040 scholarly works were returned. The results were further refined by filtering the available country options and source types. The search yielded 630 academic publications from India and the USA. We used only 628 academic publications written in English. Finally, 195 articles were made open access. This bibliometric study was based on these articles (Fig. 1).

Data analysis

A bibliometric analysis of the literature on collaborative governance reveals important variables and themes, drawing attention to the recent upsurge in this area of study and suggesting possible avenues for further investigation [28]. Data features are summarized in descriptive analysis [65]. The expansion of financial literacy articles was studied using VOSviewer [22], visualizing and analyzing bibliometric networks [49]. In the bibliometric section, we analyzed the key information summary, publication trends, prominent authors, sources, and affiliations and conducted a collaboration analysis based on documents and countries. The network was clustered using VOSviewer software. We conducted a search of the Scopus database using the specified keywords [55]. This study utilized bibliographic coupling to conduct a content analysis, which involved identifying themes and future research areas related to financial literacy and SMEs. Figure 2 illustrates the search criteria, including keywords, as well as the inclusion and exclusion criteria. This also shows the subsequent analysis.

Findings and discussion

Main information

Table 1 presents insightful information about a scholarly dataset covering the years 2021–2024. It offers comprehensive data on development, content, and collaboration trends in a particular field of study. With an annual growth rate of 4.55%, the dataset included 195 documents sourced from 102 books and journals. This suggests that research output has increased steadily over the specified time period. With an average age of 1.46 years, the documents are relatively recent, suggesting that they focus on current issues and ongoing research

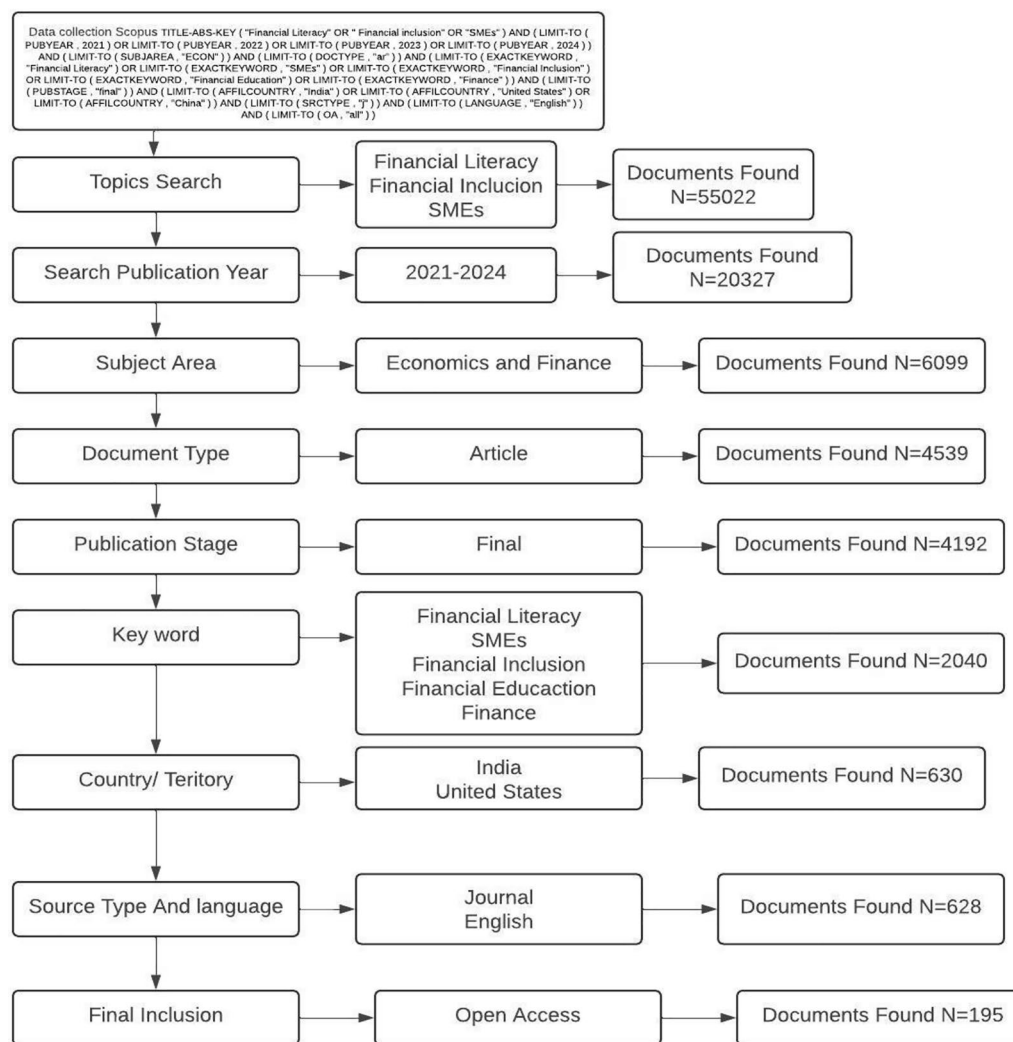


Fig. 1 Prisma protocol (author own creation)

trends. A moderate level of significance and involvement within the academic community was indicated by the mean of 12.91 citations per document. A significant number of references (11,485) indicates in-depth study and a firm grasp of the body of existing literature. A broad range of research topics and methodologies were indicated by the inclusion of 176 Keywords Plus entries and 642 author keywords. This type suggests the application of several disciplines, allowing for the exploration of a wide range of research topics within the dataset. Only nine of the 614 authors whose information is included in the dataset have contributed documents that they wrote entirely. This implies that the authors have a strong preference for working together. This is further supported by the mean value of 3.47 co-authors per document, which highlights a move toward teamwork and group research projects. A sizable percentage of

international co-authorships (55.38%) suggests that the research community is highly interconnected worldwide, encouraging cross-border cooperation that adds to the diversity and enrichment of viewpoints. As is common in academic research, where peer-reviewed journal articles serve as the primary medium for disseminating new findings, all 195 documents were categorized as articles. The dataset highlights the global interdisciplinary nature of contemporary academic research by showcasing a dynamic and collaborative research environment that prioritizes current issues, global partnerships, and a broad range of scholarly contributions.

Publication trend

A clear pattern in the publication of documents over the four-year period can be seen in the data (Fig. 3). The lowest number of documents published during the

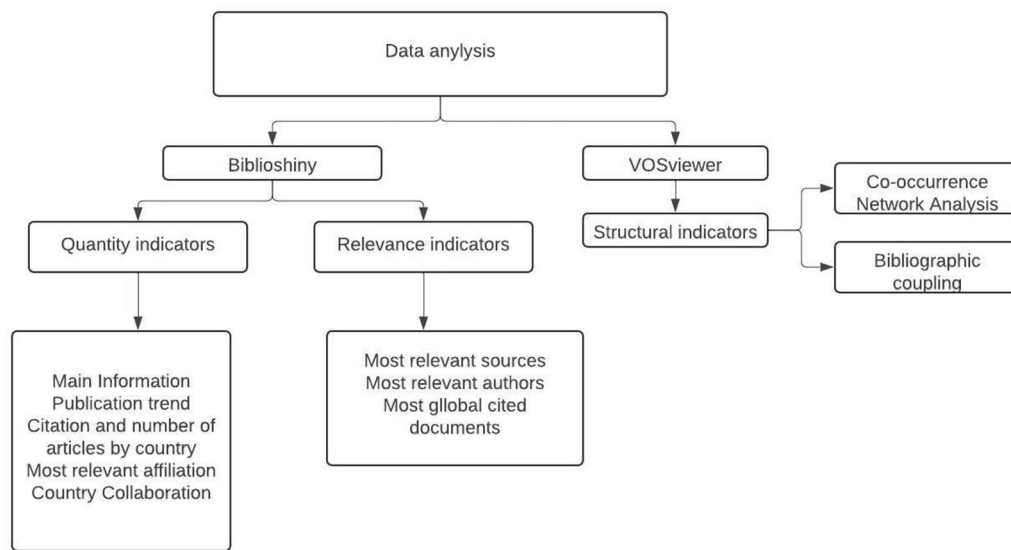


Fig. 2 Data analysis criteria. (author own creation)

Table 1 Summary of key contributions in financial literacy and eco-friendly technologies

Study	Main focus	Methodology	Key findings	Relevance to SME financial literacy
Brahmi [14]	Role of eco-friendly technologies in financial literacy	Literature review	Green finance and FinTech can aid financial literacy for sustainability	Highlights the link between environmental sustainability and financial education
Alsedrah [3]	Influence of FinTech, green finance, and renewable energy on financial literacy across income groups	Empirical analysis	Digital finance positively impacts financial inclusion, with varied effects on income levels	Suggests targeted SME policies for different income brackets
Choung [19]	Digital financial literacy and online transactions	Conceptual framework	Financial knowledge is crucial for secure online financial transactions	Relevant for SMEs adopting digital payment systems
Angrisani [7]	Age-related decline in financial literacy	Longitudinal study	Financial literacy deteriorates with age, impacting financial decision-making	SMEs should incorporate age-inclusive financial training
Galizzi [26]	Financial literacy among autistic individuals	Survey study	Lack of financial literacy research on neurodiverse individuals	Calls for financial training tailored to specific needs
Amnas [6]	FinTech adoption and financial service access	Moderation-mediation model	Regulatory support and digital financial literacy enhance FinTech access	SMEs benefit from regulatory clarity in FinTech adoption
Sawadogo [63]	Financial inclusion and industrialization in developing countries	Cross-country panel data (2000–2020)	Financial inclusion accelerates economic growth	Implications for SME financial empowerment in emerging markets
Pagliacci [54]	Inflation, devaluation, and corporate bond financing	Macroeconomic analysis	Devaluation affects corporate bond markets in Latin America	Highlights financial risks SMEs face in volatile economies

observed period was 35 in 2021. By 2022, the number of documents published had almost doubled to 60. This suggests that research activities and publication efforts have significantly increased. The publication volume stayed at 60 documents in 2023. However, there was

a noticeable decline to 40 documents overall by 2024. The first spike between 2021 and 2022 may have been caused by increased funding for research, increased interest in the topic, or the 2022 release of a backlog of finished research projects. A consistent level of research

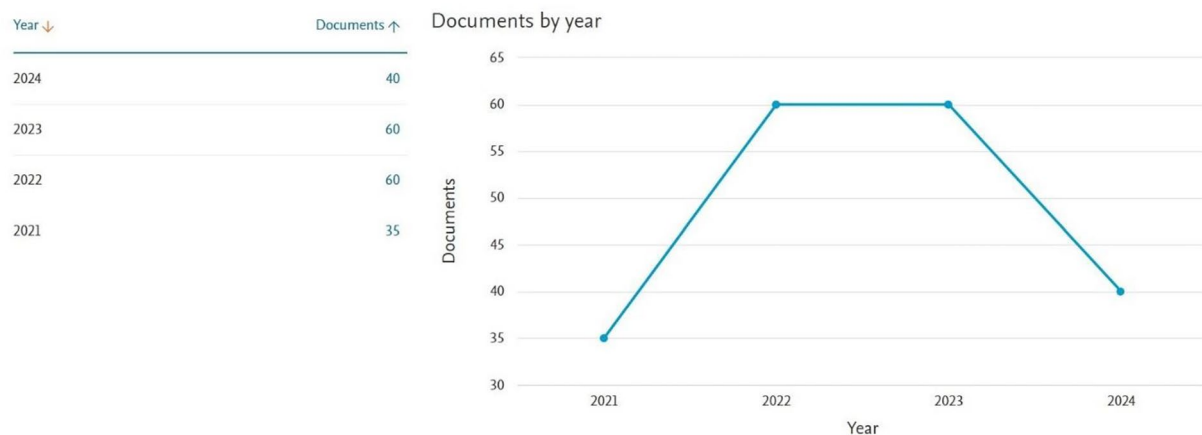


Fig. 3 Publication trend for the 195 articles from Scopus from 2021 to 2024

productivity is indicated by the number of documents produced in 2022 and 2023. A number of factors contributed to the 2024 decline, including changes in research priorities, a reduction in funding, and outside influences like changes in journal policies or world events that impact research productivity. Overall, the data show that research publication activity peaked between 2022 and 2023 and then declined in 2024. An additional analysis of external factors and internal research dynamics during this time period is required in order to understand the underlying causes of these changes (Table 2).

Most relevant sources

Numerous publications pertaining to business, finance, and economics were included in the list of journals; different levels of impact were indicated by the Scopus quartile rankings. Because of their articles' substantial contributions to their respective fields, Finance Research Letters, Empirical Economics, and the Journal of Corporate Finance are all regarded as high-impact journals. Their academic and professional peers hold them in high regard due to the creative and widely cited research that is published in these journals. Two examples of mid-tier journals (Q2) that publish significant work but have less influence than Q1 journals due to their more focused focus are the Journal of Family and Economic Issues and the Journal of the Economics of Aging. These journals continue to be highly regarded for the caliber of research they publish. Despite having a more limited scope and not always receiving the most citations, Q3 publications—like Australasian Accounting, Business and Finance Journal, and Finance: Theory and Practice—do publish valuable research findings. One example of a low-impact journal (Q4) that

Table 2 Main information

Description	Results
Main information about data	
Timespan	2021:2024
Sources (journals, books, etc.)	102
Documents	195
Annual growth rate %	4.55
Document average age	1.46
Average citations per doc	12.91
References	11,485
Document contents	
Keywords plus (id)	176
Author's keywords (de)	642
Authors	
Authors	614
Authors of single-authored docs	9
Authors collaboration	
Single-authored docs	9
Co-authors per doc	3.47
International co-authorships %	55.38
Document types	
Article	195

Summary of the main information related to the 195 articles downloaded from Scopus based on the inclusion and exclusion criteria mentioned above

targets a particular audience but has a regional focus, limiting its potential global influence, is Revista Finance Political Economic. All things considered, the journals on the list encompass a broad spectrum of research attributes and impacts, ranging from smaller, more specialized publications to highly regarded journals, all of which make substantial contributions to the spread of knowledge in their respective fields (Table 3).

Table 3 Most relevant sources (based on the number of published articles)

Sources	Volume	Publisher	Index	SJR
Journal of the economics of ageing	20	Elsevier b.v	Scopus	Q2
Journal of family and economic issues	43	Springer	Scopus	Q2
Finance research letters	47	Elsevier Ltd	Scopus	Q1
Empirical economics	63	Springer science and business media Deutschland gumbh	Scopus	Q1
Italian economic journal	10	Springer science and business media Deutschland gmbh	Scopus	Q2
Journal of risk and financial management	17	Multidisciplinary digital publishing institute (mdpi)	Scopus	Q2
Finance: theory and practice	26	Financial university under the government of Russian federation	Scopus	Q3
Investment management and financial innovations	19	Llc cpc business perspectives	Scopus	Q3
Australasian accounting, business and finance journal	16	University of wollongong	Scopus	Q3
Journal of corporate finance	71	Elsevier b.v	Scopus	Q1
Investment management and financial innovations	20	Llc cpc business perspectives	Scopus	Q3
Revista finanzas y political economical	15	Universidad Cattolica de Colombia	Scopus	Q4
Engineering economics	34	Kauno technologijos universitates	Scopus	Q2
Journal of financial services marketing	26	Palgrave macmillan	Scopus	Q2
Cogent economics and finance	11	Cogent oa	Scopus	Q3
Journal of financial regulation and compliance	31	Emerald publishing	Scopus	Q1
Electronic commerce research	24	Springer	Scopus	Q1
Small business economics	58	Springer	Scopus	Q1
Applied economic analysis	31	Emerald publishing	Scopus	Q2
Economies	11	Multidisciplinary digital publishing institute (mdpi)	Scopus	Q2

These journals were published by a number of prestigious publishers, including Springer, Cambridge University Press, Wiley-Blackwell, Routledge, and Elsevier. These publishing houses are renowned for their rigorous peer review and high publishing standards. This indicates that published research on women's financial literacy is of a high caliber, significant, and timely. The scholarly impact, visibility, and influence of these journals were assessed using the SJR rankings. The rankings are shown in Table 3.

Most relevant authors

A thorough summary of the financial literacy writers is given in Table 4, along with information about their affiliations, the total number of articles they have written, their country of origin, and—most importantly—their h-index, which gauges the significance and output of their work. With an h-index of 86, Annamaria Lusardi of Stanford University was the most influential individual in her field. Chen Z of the University of California, San Diego, came in second with an h-index of 59. Although some authors, like Zhang Y and Mitchell OS, are affiliated with prestigious US universities, their lower h-indices

Table 4 Most relevant authors (based on number of publications)

Authors	Author affiliation	# of Articles	Country	H- index
Annamaria Lusardi	Stanford University	5	United states	86
Mitchell OS	University of Pennsylvania	5	America	NA*
Chen Z	University of California, San Diego	3	California	59
Zhang Y	Carnegie Mellon University	3	Pittsburgh, Pennsylvania	5
Adomako S	CSIR-Crops Research Institute,	2		10
Ahsan M	Faculty of Islamic Economics and Business	2	Indonesia	9
Alharthi M	Shaqra University	2	Saudi Arabia	8
Ali A	Arizona State University	2		51
Satish Kumar	Indian institute of management	NA*	India	71
Amankwah-Amoah J	Durham University	2	Africa	52

NA*(Not available)

suggest that they are either still in the early stages of their careers or focus on specialized financial literacy subjects. Global research contributions are demonstrated by the inclusion of authors from diverse regions such as Indonesia and Saudi Arabia. Researchers from developing nations such as India and Africa are a sign of growing financial literacy in international cooperation and the generation of new knowledge

underlined how crucial financial literacy is to assisting low-income communities in improving their financial situation. All things considered, these well-known authors have made incredibly noteworthy intellectual contributions to the field of financial literacy, demonstrating their unwavering dedication to advancing this important topic.

Most relevant affiliation

Table 5 displays the distribution of financial literacy research output from various universities worldwide. With a combined total of seven and six articles, respectively, Aligarh Muslim University and Amity University, both in India, have significantly advanced the field of financial literacy. The importance of financial literacy in American academia is demonstrated by the large number of American universities that have published extensively on the subject, including the University of Wisconsin–Madison. As a result of China's increasing involvement in financial literacy, institutions

such as Sichuan University and Fuzhou University of International Studies and Trade have made significant contributions to this area. A diverse global commitment to advancing financial literacy is demonstrated by the inclusion of institutions from other countries such as Pakistan, Saudi Arabia, England, Malaysia, Sweden, and Vietnam. This broad involvement from academic institutions emphasizes how crucial financial literacy is to empowering people all over the world to make wise financial decisions.

Most global cited documents

The research on how financial inclusion and literacy affect economic growth and behavior is examined in Table 6. Kaiser and Lusardi's [36] noteworthy study highlights the significant influence of financial education on knowledge and subsequent behaviors, as evidenced by its high citation count and impact annually. Examining the benefits and drawbacks of digital finance, Yue and Korkmaz [73] and Lu [45] conclude that while it can promote inclusion, it also raises the risk of debt traps, particularly in developing nations. The importance of governance in MENA nations' efforts to achieve financial inclusion and economic growth is emphasized by Emara and El Said [23]. Lusardi et al. [46] discovered a similar focus on literacy-based financial resilience building. All things considered, these studies demonstrate the value of financial literacy in fostering economic stability and

Table 5 Most relevant affiliations (based on the number of articles published)

Affiliations	Country	# of articles
Aligarh Muslim University	India	7
University of Wisconsin-Madison	Us	7
Amity University	India	6
Fuzhou University of International Studies and Trade	China	6
Linköping University	Sweden	6
Sichuan University	China	6
Symbiosis International (Deemed University)	India	6
University Putra Malaysia	Malaysia	5
Michigan State University	Us	4
Ningbo University	China	4
Phenikaa University	Vietnam's	4
Saudi Electronic University	Saudi Arabia	4
Sharda University	India	4
University of Massachusetts Lowell	Us	4
University of Minnesota	Us	4
University of Wisconsin	Us	4
World Bank	Us	4
Yunnan Normal University	China	4
Aston University	England	3
Bahauddin Zakariya University	Pakistan	3

Table 6 The most globally cited documents

Author	Year	Title	Source	Total citation	TC per year
Tim Kaiser A, Annamaria Lusardi	2022	Financial education affects financial knowledge and downstream behaviors	Journal of financial economics	129	43
Pengpeng Yue, Aslihan Gizem Korkmaz	2022	The rise of digital finance: financial inclusion or debt trap?	Finance research letters	127	42.33
Zhiqiang LU	2022	Local bank, digital financial inclusion and SME financing constraints: empirical evidence from china	Emerging markets finance and trade	111	37
Noha Emara, Ayah EL Said	2021	Financial inclusion and economic growth: the role of governance in selected MENA countries	International review of economics & finance	108	27
Hasanul Banna M. Kabir Hassan, Mamunur Rashid	2021	FinTech-based financial inclusion and bank risk-taking: evidence from OIC countries	Journal of international financial markets, institutions and money	90	22.5
Annamaria Lusardi, Andrea Hasler & Paul J. Yakoboski	2021	Building up financial literacy and financial resilience	Mind & society	80	20
Dawit Bahta, Jiang Yun, MD Rashidul Islam & Kuyon Joseph Bikanyi	2021	How does CSR enhance the financial performance of SMES? the mediating role of firm reputation	Economic research-ekonomska istraživanja	72	18
Xiuping Hua& Yiping Huang	2021	Understanding China's FinTech sector: development, impacts and risks	The European journal of finance	67	16.75
Laura Bottazzi, Annamaria Lusardi	2022	Stereotypes in financial literacy: evidence from Pisa	Journal of corporate finance	52	13
Green business practices and corporate financialization: role of female directors in Chinese small and medium enterprises (SMES)	2023	Green business practices and corporate financialization: role of female directors in Chinese small and medium enterprises (SMES)	Corporate accounting and finance	17	8.5

empowering individuals to make informed financial decisions, particularly in view of the financial sector's rapid changes.

Policymakers, scholars, and practitioners working in the domains of financial literacy, small and medium business (SME) planning, and associated factors across different nations can benefit greatly from the information these research papers offer.

Country collaboration map

Figure 4 illustrates the global network of financial literacy research collaborations by emphasizing important areas of scholarly activity. China, India, and the USA are central hubs, with several connecting lines and darker shading. According to this finding, they are important in the study of financial literacy. These lines make clear that a large, interrelated effort has been made to advance financial literacy globally. These partnerships span parts of the Middle East, South America, Southeast Asia, and Europe. The concentration of connections between prestigious academic institutions demonstrates the importance of international collaborations in exchanging information about financial education. This global network demonstrates the increasing agreement

that financial literacy is a crucial area of research that is essential to fostering economic resilience and empowering individuals to make informed financial decisions globally. This graphic emphasizes the necessity of continuous international cooperation to address the issue of financial literacy, which is a problem in many cultural and socioeconomic contexts.

Co-occurrence network

Figure 5 and appendix contain a word list, frequency of occurrence, and total link strength (Appendix A), which measures the intensity of relationships between keywords in the literature, all of which pertain to the field of small and medium enterprises (SMEs) in financial literacy. In this area of study, stronger associations were indicated by higher values, whereas weaker connections were suggested by lower values. The picture shows the keyword network, emphasizing the need for financial literacy (red) literacy in personal finance (brown), access to financial services (yellow), and SMEs. Both the frequency of mentions (72) and the total number of links pointing to financial inclusion make it an important subject. There have been 56 instances of financial literacy research, with a total link strength of 72. This area is also significant.

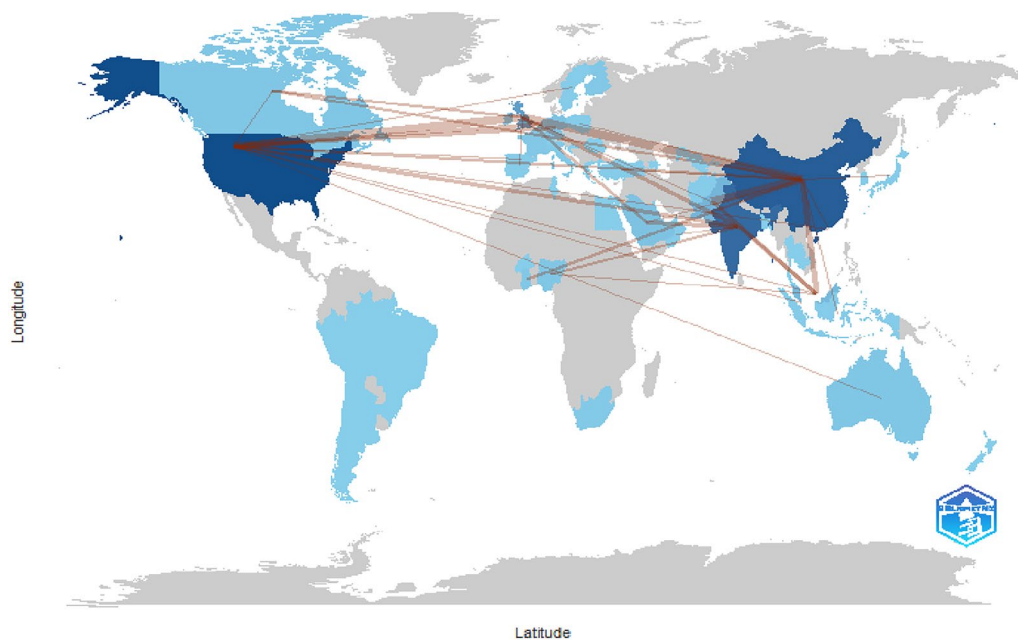


Fig. 4 Country collaboration map. Source Biblioshiny

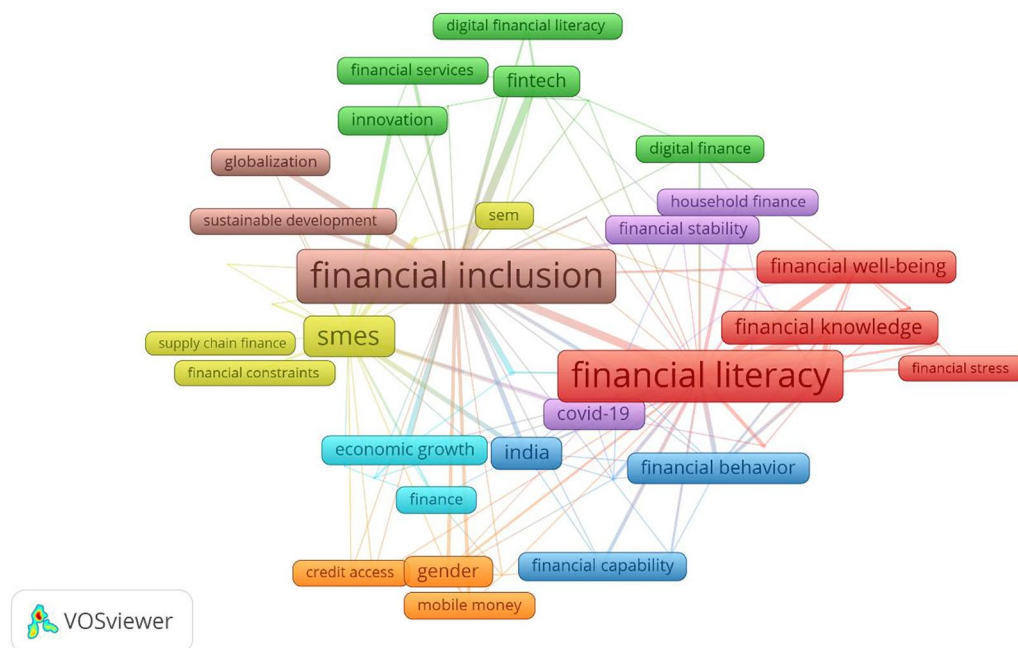


Fig. 5 Keyword co-occurrence network. source VOSviewer

SMEs are also prominent, with high occurrence and total-link-strength keywords, such as SMEs. The necessity to address development is indicated by the high frequency of phrases, such as financial literacy and SMEs empowerment. Regarding the topic of financial literacy and medium-sized enterprises (SMEs), other

significant keywords include education, globalization, and innovation. Digital finance and microfinance are two examples of keywords with lower occurrences and link strength, suggesting that they are not as often studied in this context. Figure 5 and Appendix A summarize the current state of research on financial literacy and

medium-sized enterprises (SMEs), drawing attention to important themes and areas of interest.

This is an important area as well. With high occurrence and total-link-strength keywords like SMEs, SMEs are also well known. The high frequency of terms like financial literacy and SMEs empowerment indicates the need to address development. Other important keywords related to the subject of financial literacy and medium-sized businesses (SMEs) are innovation, globalization, and education. Keywords with lower occurrences and link strengths, such as digital finance and microfinance, indicate that they are not as frequently researched in this field. The current status of research on financial literacy and medium-sized businesses (SMEs) is summed up in Fig. 5 and Appendix A, which highlights key themes and research areas.

Bibliographic coupling

To gain a deeper understanding of the themes and connections between cited publications, we conducted a bibliographic coupling analysis using VOSviewer. In this exercise, 195 articles were used, and the number of citations was subsequently reduced to 46. However, only 15 articles were included in this bibliographic analysis. This analysis clustered publications based on their convergence in terms of citations. Clustering facilitates a thematic evaluation of the co-citation network [46]. This is a subjective approach that requires evaluation by experts to enhance and produce meaningful clusters [73]. The bibliographic coupling analysis conducted using Vos

Viewer has identified a total of seven distinct themes. These themes were derived from a dataset of 15 articles, as illustrated in Fig. 6. After conducting a thorough manual review and analysis of all the articles, certain similarities were identified. These similarities were combined to create four distinct themes, as illustrated below.

Theme 1. Global financial literacy: addressing disparities and enhancing education on SMEs.

Theme 2. Addressing SMEs in financial inclusion and personal finance behavior.

Theme 3. Empowerment through financial literacy: overcoming the manacles of domestic violence.

Theme 4. SMEs development planning and preparedness.

Theme 1

“Global Financial Literacy: Addressing Disparities and Enhancing Education on SMEs.” I explore the academic discussion surrounding global financial literacy, which has significant significance. Studies in this field have revealed substantial variations in financial literacy levels across various countries and demographic cohorts. We analyze the impact of digitalization on individuals’ financial literacy and financial capability [39]. The long-term consequences of financial fragility on individuals were analyzed, specifically focusing on the adverse effects of financial fragility on financial optimism [16]. The analysis emphasizes notable regional discrepancies in financial literacy, shaped by factors such as the



Fig. 6 Bibliographic coupling Source VOSviewer

prevalence of digital technology, education systems, economic conditions, and cultural attitudes [72]. This situation offers prospects and challenges for enhancing financial literacy [9]. The research emphasizes disparities in financial literacy, specifically among marginalized communities, which raises concerns about decreased financial well-being, increased economic inequality, and less effective financial decision-making.

The research emphasizes disparities in financial literacy, specifically among marginalized communities, which raises concerns about decreased financial well-being, increased economic inequality, and less effective financial decision-making.

Theme 2

Regarding SMEs in financial inclusion and personal finance behavior, the FinTech sector significantly influences MSMEs' financial behavior through fostering responsible financial practices, expanding financial inclusion, and facilitating better access to financial services [34]. Financial literacy has a negligible effect on business sustainability [60]. This research has provided insight into the adverse effects of small- and medium-sized enterprises (SMEs) inequality on marginalized groups such as the financially disadvantaged, individuals with lower levels of education, and those living in poverty. The interconnection between financial inclusion and sociocultural, institutional, legal, and regulatory factors has been emphasized as the main factor contributing to the gender gap in financial inclusion.

Within the context of financial decisions made by small- and medium-sized enterprises (SMEs), we propose that nonfinancial factors, such as the attitudes of SME owner-managers, subjective norms, perceived behavioral control, and behavioral intentions, have a significant impact on the financial decisions made by SMEs [11]. Data were analyzed using the data analysis method. The findings indicate that both financial and digital financial literacy have a substantial impact on the ability of batik small enterprises to access financial inclusion [4]. Hence, it is imperative to foster increased financial literacy, specifically among small- and medium-sized enterprises (SMEs), to improve their individual financial decision-making and overall economic prosperity.

Theme 3

Empowerment through financial literacy: Overcoming the manacles of Domestic Violence.

One effective strategy for overcoming the constraints placed on victims of domestic abuse is financial literacy. Developing financial management, budgeting, saving, and investing skills give survivors the information and confidence they need to take back control of their lives.

Achieving financial independence provides a way to attain safety and stability while reducing dependency on abusive partners. People can obtain and protect resources, build a strong credit history, and tactically get ready for a violent-free future by learning how to use financial systems. Beyond simply being knowledgeable, financial literacy has the power to transform lives, enabling survivors to break free from the cycle of abuse and live independent, respectful lives.

The widespread occurrence of intimate partner violence and domestic violence in financial literacy has gained global recognition, and numerous studies have investigated the fundamental factors that contribute to this phenomenon. Financial dependence has become a significant factor contributing to intimate partner violence (IPV) and domestic violence among low-income women. The Global Financial Literacy Survey aimed to gather a market-based assessment of individuals' financial literacy by measuring their financial knowledge [5]. This study analyzed the impact of financial literacy on behavioral biases in investment decisions and found that it has a significant moderating effect [47]. There is a correlation between women's economic empowerment and access to formal and informal financial accounts [74]. Enhancing human capabilities by tackling common challenges and exploring how these challenges can enhance comprehension of the learning process [66]. By promoting independence and self-reliance, financial literacy enables individuals to escape the abuse cycle. Haselip J, Desgain D, Mackenzie G [33] it functions as an essential instrument for creating a safer and more secure future.

Theme 4

SMEs development planning and preparedness.

The planning and preparedness of SMEs are vital to the growth and resilience of their businesses. SMEs can enhance their ability to overcome challenges by setting explicit objectives, evaluating market trends, and formulating back-up strategies. These businesses can adapt and succeed in a competitive environment by prioritizing innovation, financial management, and strategic partnerships.

A better understanding of and approach to personal and community preparedness can improve disaster response, lessen casualties and economic harm, strengthen communities, allocate resources more wisely, and speed up recovery times [25]. Manufacturing SMEs can mitigate the effects of and recover more quickly from devastating floods by implementing a variety of physical/structural and social preparedness adaptation measures. These measures were evaluated using agent-based modeling and simulations [20]. As a result,

businesses should put resources into business continuity and recovery planning in order to be proactive and well prepared [48] things like specific allocations of funds, user accounts, established policies and procedures, and methods for controlling access [17]; small- and medium-sized businesses (SMEs) faced challenges in remaining resilient during and after the pandemic [69]. Theme: 4 explains the unique challenges faced by the biggest obstacle to energy SMEs establishing and growing was access to local financing. In order to adapt to changes and overcome market obstacles, SMEs need to be well prepared and plan ahead. They can accomplish long-term success and sustainable growth by being strategic and adaptable.

Discussion

The bibliographic coupling analysis identified several predominant themes: "Global Financial Literacy: Addressing Disparities and Enhancing Education," "Addressing SMEs in financial inclusion and personal finance behavior," "Empowerment through Financial Literacy: Overcoming the Constraints of Domestic Violence," and "Development Planning and Preparedness."

Theme: 1. Global financial literacy is crucial for mitigating economic inequalities and enhancing the education of small- and medium-sized enterprises (SMEs). Financial literacy involves the understanding of essential financial principles and concepts, such as budgeting, saving, investing, and debt management. Unfortunately, many individuals and small- to medium-sized enterprises (SMEs), especially in developing countries, lack access to quality financial education. This leads to a significant gap in the knowledge and skills required for proficient financial management. Financial literacy levels demonstrate considerable disparity due to factors including educational achievement, income, and cultural heritage. There is a positive correlation between higher levels of education and a greater understanding of financial matters [71]. This disparity exacerbates economic inequality, as individuals with limited financial literacy are more susceptible to making unwise financial choices, accumulating substantial debt, and experiencing economic volatility. In order to tackle these inequalities, it is crucial to establish all-encompassing financial education initiatives, specifically designed to cater to the requirements of small- and medium-sized enterprises (SMEs).

These programs must emphasize the cultivation of pragmatic skills including cash flow management, financial planning, and risk assessment. Furthermore, they must confront the cultural and socioeconomic barriers that may impede individuals' access to financial

literacy. Furthermore, employing technology can enhance the reach and effectiveness of these programs by providing interactive and readily accessible educational opportunities. Cooperation among governments, educational institutions, and financial organizations is essential to formulate comprehensive financial education strategies that enable individuals and medium enterprises (SMEs) to make informed financial decisions. Promoting extensive financial literacy can foster a more equitable economic landscape, enabling small- and medium-sized enterprises (SMEs) to thrive and substantially contribute to overall economic growth. Enhanced financial literacy benefits individual enterprises, while fostering economic stability and growth, thereby reducing inequalities and promoting a more inclusive global economy.

Theme: 2. Focusing on small- and medium-sized enterprises (SMEs) is crucial for fostering sustainable economic growth and improving entrepreneurs' financial practices. A considerable proportion of small- and medium-sized enterprises face challenges in securing financial services because of their insufficient credit histories, lack of collateral, and limited financial literacy. Enhancing financial inclusion for small- and medium-sized enterprises (SMEs) requires providing accessible financial services, including microloans, credit facilities, and savings accounts. These services empower SMEs to proficiently manage their cash flow, invest in expansion, and endure economic recessions. Moreover, the advancement of financial literacy and education tailored for small- and medium-sized enterprises (SMEs) can improve individuals' personal finance practices, enabling business owners to make informed decisions about budgeting, saving, and investing. By incorporating small- and medium-sized enterprises (SMEs) into the formal financial system and supplying vital resources and expertise, we empower entrepreneurs to build stronger businesses and create significant. FinTech has a significant impact on the financial behavior of micro-, small-, and medium-sized enterprises (MSMEs) by promoting greater financial inclusion, which in turn leads to enhanced financial practices [34]. However, when financial inclusion increases beyond this basic level, it has a positive impact on controlling corruption [12]. Facilitating financial inclusion and literacy for small- and medium-sized enterprises (SMEs) empowers entrepreneurs to make well-informed decisions, which in turn promotes business expansion and enhances economic resilience. By addressing these requirements, we can establish a more comprehensive and enduring economy.

Theme: 3 Financial literacy is crucial for overcoming the limitations imposed by domestic violence. Financial literacy equips survivors with the necessary knowledge

and abilities to effectively handle money, create budgets, save money, and strategize for the future, consequently promoting autonomy from abusive partners. Gaining knowledge about personal finance empowers individuals to liberate themselves from financial manipulation and reliance, a strategy frequently employed by abusers to retain dominance. Financial independence empowers survivors by providing them with the necessary confidence and resources to reconstruct their lives, find secure housing, and obtain employment. Providing individuals with access to financial education and support services can help them in building credit and understanding financial systems, thereby improving their capacity to attain stability and security. Financial literacy serves as a powerful tool for survivors, enabling them to regain control over their lives and escape from violence and abuse.

Theme: 4 The development planning and preparedness of SMEs are crucial for promoting growth, resilience, and competitiveness in a dynamic market. Efficient planning entails establishing unambiguous goals, comprehending market dynamics, and recognizing potential hazards and prospects. Preparedness necessitates the formulation of all-encompassing strategies that tackle the areas of financial management, supply chain stability, and technological adaptation. Small- and medium-sized enterprises (SMEs) should give priority to developing adaptable business models that can promptly respond to changes in the market, economic fluctuations, or unforeseen crises. This encompasses allocating resources toward employee training, implementing digital tools, and adopting sustainable practices that improve operational efficiency. In addition, establishing robust networks and partnerships can offer supplementary resources and assistance, enabling small- and medium-sized enterprises (SMEs) to innovate and expand more efficiently. By prioritizing both development planning and preparedness, small- and medium-sized enterprises (SMEs) can not only survive but also prosper in a competitive environment, making a substantial contribution to economic growth and the creation of jobs. In the end, proactive planning and strategic preparedness are the fundamental principles that lead to long-term success for small- and medium-sized enterprises.

Conclusion

This research employed bibliometric and content analysis methods to examine the academic discourse in diverse areas of financial literacy for small- and medium-sized enterprises (SMEs). The research examined a dataset comprising 195 articles published between 2021 and 2024. It analyzed publication trends, identified key sources,

authors of the articles, and their corresponding countries and affiliations. Furthermore, four principal themes and their associated potential research domains were discussed. The examination of financial literacy for SMEs is essential, as its outcomes can significantly aid regulatory bodies, agencies, non-profit organizations, and all stakeholders in formulating and executing regulations and programs. This would substantially enhance the financial literacy of small- and medium-sized enterprises (SMEs), thereby empowering them to attain financial independence and develop the skills essential for wealth management, as well as to adeptly manage any adverse outcomes.

Formulating and executing regulations and initiatives, especially aimed at women, are essential in the current rapid yet unpredictable financial environment post-pandemic. In modern society, small- and medium-sized enterprises (SMEs) are substantially contributing to the economic stability of their families. They are serving as primary or secondary earners and actively engaging in financial responsibilities. Small- and medium-sized enterprises gain from financial literacy and knowledge, as these equip them with essential skills and expertise to navigate the fluctuating economic landscape and manage their financial future effectively. Financial inclusion facilitates access to essential financial services and products necessary for business expansion, wealth accumulation, and safeguarding against financial instability for individuals and their families.

A thorough understanding of these issues could aid regulators and policymakers in developing policies and programs that enable women to make informed financial decisions, safeguard their futures, and ultimately strengthen economic resilience. To rectify the deficiencies in financial literacy, inclusion, education, and capability among micro and small enterprises (MSEs), it is essential for governments, the private sector, non-profits, and financial institutions to collaborate effectively. Financial literacy, inclusive education, and capability are essential for the financial well-being of SMEs in the contemporary dynamic environment. These factors empower SMEs to proficiently oversee and strategies their finances, resulting in enduring sustainability.

Appendix
Keyword co-occurrence

Yellow cluster		
Key word	Occurrences	Total link strength
SMEs	58	36

Yellow cluster		
Key word	Occurrences	Total link strength
Financial performance	4	3
Sustainability	4	5
SME	3	6
Digital financial inclusion	2	2
Supply chain finance	2	1
Financial constraints	2	2
<i>Red cluster</i>		
Financial literacy	56	72
Financial advice	3	5
Financial education	9	21
Financial knowledge	7	18
Financial well-being	6	15
Financial awareness	2	8
Financial behavior	2	7
Financial stress	2	3
<i>Sky blue cluster</i>		
Economic development	5	8
Economic growth	6	9
Financialization	2	3
Financial development	3	6
Finance	7	6
<i>Orange cluster</i>		
Gender	6	13
Credit access	2	4
Financial exclusion	2	5
mobile money	3	6
Digital financial service	3	6
<i>Thick blue cluster</i>		
Financial behavior	5	14
Financial access	2	5
Financial capability	4	7
India	9	15
Financial fragility	3	8
Supply chain management	2	2
Financial technology	5	10
<i>Violet cluster</i>		
Covid 19	8	14
Small and medium Entrepreneur	2	3
Financial resilience	3	5
Personal finance	4	9
Financial stability	4	8
Household finance	4	6
<i>Green cluster</i>		
Digital finance	3	6
Mobile payments	3	5
Micro finance	2	4
FinTech	8	14
Financial regulation	2	4
Innovation	5	7

Yellow cluster		
Key word	Occurrences	Total link strength
Financial services	3	5
Digital financial literacy	2	4
<i>Brown cluster</i>		
Financial inclusion	72	74
Sustainable development Goals	2	3
Sustainable development	4	4
Globalization	6	6

Abbreviations

SMEs	Small and medium entrepreneurs
IPV	Intimate partner violence
MSMEs	Micro, small and medium entrepreneurs

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Author contributions

KD contributed to writing—original draft, and she was a major contributor in writing the manuscript. KA was involved in the review and editing. GG assisted in the conceptualization and data visualization. MS contributed to methodology and overall supervision. All authors read and approved the final manuscript.

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Availability of data and materials

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Declarations

Ethics approval and consent to participate

Not applicable.

Consent for publication

We confirm that the manuscript has been read and approved by all named authors and that there are no other persons who satisfied the criteria for authorship but are not listed. We further confirm that the order of the authors listed in the manuscript has been approved by all of us.

Competing interests

The authors declare that they have no competing interests.

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