

The role of clusters in fostering entrepreneurship: A bibliometric study of global research trends

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Abstract

This paper conducts a bibliometric exploration of research linking two concepts i.e. clusters and entrepreneurship, a domain that has expanded steadily over the past thirty years. Using 155 peer-reviewed articles sourced from the Dimensions database (1996–2025), the study applies the SPAR-4-SLR framework along with visualization software (VOSviewer) to identify intellectual patterns in publication trend, citations trend, influential journals, influential field of research and new themes map. The analysis highlights a consistent growth in publications from the early 2000s, with output peaking around 2021, followed by diversification into new thematic directions. Contributions are geographically widespread, though the United States accounts for much of the citation influence, particularly through foundational studies by Feldman (2001, 2005) and Sonfield & Lussier (2004). Among journals, Entrepreneurship and Regional Development leads in productivity, whereas Industrial and Corporate Change demonstrates higher citation impact. Bibliographic coupling reveals eight thematic clusters, centering on networks, social capital, proximity, and entrepreneurial capability as drivers of cluster vitality. Emerging topics such as digital entrepreneurship, artisanal industries, and handloom clusters suggest the field's increasing socio-economic scope. Overall, the findings emphasize clusters as catalysts of innovation, entrepreneurship and regional competitiveness, while offering insights for scholars and policymakers interested in advancing sustainable and entrepreneurship-driven development.

Keywords: Bibliometric, Clusters, Entrepreneurs, Entrepreneurship, Industrial Clusters

JEL Classification: A1, M130

1. Background of the Study

The origin of the cluster concept can be traced back to Alfred Marshall, who, in his seminal work *Principles of Economics* (Marshall, 1920), examined industrial agglomeration and introduced the idea of industrial districts, describing how specialized industries concentrate in certain geographical regions. This foundation was further advanced by Michael Porter, whose *Competitive Advantage of Nations* (Porter, 1998) popularized the modern cluster framework, defining clusters as geographically proximate groups of interconnected firms including suppliers, infrastructure providers, manufacturers, and customers alongside supportive institutions such as universities, research organizations, trade associations, and training centers, all linked within a specialized domain. Building on this perspective, subsequent scholars have refined and extended the concept (Baptista & Swann, 1998; UNIDO, 2006; Das et al., 2007; Giuliani, 2013). In India, the Planning Commission (2012) defined clusters as networks of firms and institutions that share markets, technologies, workforce skills, and buyer–seller linkages within a defined geography. Indian clusters are generally categorized into SME clusters, handloom clusters, and handicraft clusters, often identified by both product and region, with prominent examples such as the Gurugram auto-component cluster, Tirupur cotton hosiery cluster, Ludhiana knitwear cluster, Moradabad brassware cluster, and Bangalore’s IT cluster, many of which have gained national and international recognition over decades.

Previous studies on cluster highlights several determinants of cluster formation, including Porter’s (1998) emphasis on innovation, related industries, and local demand conditions, Boari’s (2001) focus on demanding customers and local expertise, Maskell’s (2001) recognition of knowledge creation, R&D strength, networks, infrastructure, and entrepreneurship, and Yamawaki’s (2002) stress on large firms, supporting industries, and skilled labor. Indian scholars such as Khomiakova (2007) and Das (2008) note that indigenous firms, informal networks, and macro-policy conditions can initiate cluster development, while studies by Oprime et al. (2011), Fundeanu and Badele (2014) and König & Brenner (2025) underscore the importance of collaboration among firms, universities, and research institutes. Varman and Chakrabarti (2011) highlight the role of artisans’ skills, trust, and decentralized production, and Hsu et al. (2014) emphasize professional human resources. Alinsaoui et al. (2024) highlighted several key factors contributing to the formation and success of industrial clusters, including robust financial backing, the presence of internationally recognized universities and research laboratories, limited labor mobility, the availability of skilled and highly specialized workers, and a strong culture of entrepreneurship.

Scholars also agree that clusters generate substantial benefits for firms and regions: they enhance productivity, sales, employment, and overall firm performance (Pouder & St. John, 1996; Barkley & Henry, 1997; Das & Das, 2011; Porter, 1998; Boari, 2001; Maskell, 2001; Rawat et al., 2019; Temouri et al., 2025), provide access to suppliers, policy support, and labor division (Yamawaki, 2002), and foster innovation and technological diffusion (Bell, 2005; Lai et al., 2014; Rocha, 2015; Franco et al., 2024; Liu et al., 2025). Additional advantages include reduced operational and

transportation costs (Karaev et al., 2007; Khomiakova, 2007), stronger competitiveness (Niu et al., 2008; Oprime et al., 2011), rapid adoption of new products and technologies (Porter, 2007; Felzensztein et al., 2012), and improved regional and economic outcomes (Narayana, 2007; Das & Das, 2011; Chakrabarty, 2020; Aydemir et al., 2024). Some contributions emphasize clusters' role in technology transfer, capital efficiency, shared logistics, and expanded market access (Solvell, 2008; Deif & Mohib, 2021; Anić, 2022; Kim et al., 2023). Taken together, these insights show that clusters are engines of regional growth, drivers of competitiveness, and incubators of entrepreneurship, as they stimulate innovation, risk-taking, and value creation (Fundeanu & Badele, 2014; Rawat et al., 2017; Biggeri et al., 2022; Lytvyn et al., 2025), ultimately making them central to long-term economic and social development.

Entrepreneurship has been conceptualized in multiple ways over time, reflecting its dynamic, evolving, and multidimensional nature. Early understandings, such as Draheim (1972), perceived it as the establishment of a new enterprise, while Vesper (1980) considered it as the creation of new ventures initiated by individuals or groups. Later, Wortman (1990) expanded this by emphasizing entrepreneurship in rural contexts, defining it as the development of organizations that introduce new products, tap into emerging markets, or utilize innovative technologies. Stevenson and Jarillo (1990) introduced a broader view by describing entrepreneurship as the pursuit of opportunities without regard to the resources currently controlled, while Churchill and Muzyka (1994) framed it as the recognition and exploitation of opportunities to generate value through innovation, regardless of existing organizational structures. Shane and Venkataraman (2000) placed opportunity recognition at the core, focusing on how entrepreneurial opportunities for goods and services are identified, evaluated, and exploited, whereas Messegheem (2003) highlighted entrepreneurship as a multifaceted process that involves validating, developing, and implementing new ideas. Building on these views, Gedeon (2010) presented a multidimensional perspective linking entrepreneurship to several theoretical traditions such as Risk Theory (ownership and uncertainty), Dynamic Theory (innovation and development), Traits School (entrepreneurial personality and leadership), Behavioural School (process of venture creation), and the Austrian School (opportunity recognition for market equilibrium). Contemporary contributions have broadened the scope beyond economic value creation, recognizing its social and cultural dimensions, as Chang and Wyszomirski (2015) explained, framing entrepreneurship as a driver of socio-cultural as well as economic transformation. Similarly, Elia et al. (2020) focused on the identification and recombination of resources for commercializing innovations, while Prince et al. (2021) emphasized entrepreneurship's ability to generate value under conditions of uncertainty and risk. Most recently, Ratten (2023) described entrepreneurship as an opportunity-seeking, resource-driven, and process-oriented activity that combines innovation and creativity to generate multidimensional value. Taken together, these perspectives suggest that entrepreneurship is not a single phenomenon but a dynamic, opportunity-driven process integrating innovation, adaptability, and value creation across economic, social, and cultural spheres.

Entrepreneurship manifests in multiple forms, each with distinct contributions to development. Opportunity entrepreneurship, for example, arises from identifying and exploiting new market prospects, often associated with competitiveness, innovation, and growth (Fairlie & Fossen, 2020; Mrożewski & Kratzer, 2016). In contrast, necessity entrepreneurship is driven by compulsion, where individuals turn to self-employment due to a lack of jobs, making it common during economic crises (Fairlie & Fossen, 2020). Other unique forms include artisan and craft entrepreneurship, where individuals use creativity, cultural heritage, and manual skills to produce non-mass-produced goods such as handicrafts, pottery, jewelry, or wooden products. Artisan entrepreneurship emphasizes innovation and uniqueness, while craft entrepreneurship often embodies personalization and reliance on traditional, resource-based production methods, serving both as livelihood and preservation of heritage. In the digital age, digital entrepreneurship has gained increasing importance and is defined as the creation of value through digital innovation and socio-technical enablers (Sahut, Iandoli, & Teulon, 2019). This form involves establishing new digital-based ventures or transforming existing businesses using advanced technologies. Another critical type is social entrepreneurship, where the priority lies in solving societal challenges and generating social impact through innovative, sustainable approaches (Swanson & Zhang, 2010; Fauzi et al., 2022). Collectively, these forms reveal entrepreneurship's diversity, ranging from survival-driven efforts to innovation-led ventures that simultaneously foster economic development, cultural preservation, and social progress.

To explain entrepreneurial behavior, several theoretical frameworks have been advanced. Schumpeter's Innovation Theory in 1934 characterizes entrepreneurs as agents of "creative destruction," where innovations disrupt existing market structures while creating new growth opportunities. Sarasvathy's Effectuation Theory in 2001 challenges the traditional rational choice model by emphasizing adaptive decision-making under uncertainty, suggesting that entrepreneurs focus on leveraging available resources to shape new possibilities rather than predicting fixed outcomes (Sarasvathy, 2001). Similarly, Bricolage Theory (Baker & Nelson, 2005) underscores how entrepreneurs creatively use limited or accessible resources to address challenges and pursue opportunities, making it particularly relevant in resource-constrained contexts like rural regions. Collectively, these frameworks demonstrate the dynamic, adaptive, and innovative nature of entrepreneurship, highlighting how entrepreneurs operate under uncertainty, resource scarcity, and evolving market conditions.

The significance of entrepreneurship extends far beyond individual or organizational success, as it plays a central role in fostering economic, social, and sustainable development. Belz (2013) emphasized its contribution to sustainability by promoting eco-friendly practices and advancing transitions to greener futures. Socially, entrepreneurship enhances inclusivity by empowering marginalized groups, especially women in rural areas, enabling them to achieve financial independence while preserving cultural traditions (Haugh & Talwar, 2014). Rural entrepreneurship in particular has been strongly linked to regional development, creating localized

job opportunities and income generation that build community resilience (De Los Ríos-Carmenado et al., 2016; Ratten, 2023). On a broader scale, entrepreneurship fuels innovation, drives economic growth, and generates employment by introducing new types of products, services, and technologies (Doody et al., 2016; Satalkina & Steiner, 2020). Governments and policymakers view entrepreneurship as a key driver of technological advancement and structural economic reform, making it a priority area for development strategies (Karimi et al., 2017; Kautonen et al., 2017). Moreover, entrepreneurship education and training play a crucial role in building entrepreneurial capacity, particularly for rural women entrepreneurs in handloom and other craft sectors, by reducing risk aversion and enhancing business sustainability (Goswami et al., 2017). In India, the handicraft sector provides a strong example of how innovative and digital entrepreneurship can revitalize traditional industries, helping artisans adapt during crises while fostering handmade products as globally viable enterprises (Yadav et al., 2023). Overall, entrepreneurship acts as a multidimensional engine of progress—stimulating innovation, empowering communities, sustaining traditions, and ensuring resilience in changing socio-economic contexts.

Prior studies have examined the relationship between entrepreneurship and clusters, showing that entrepreneurs play a crucial role in cluster formation (Feldman & Francis, 2006), and that clusters influence entrepreneurship at the regional level (Rocha & Sternberg, 2005). Empirical evidence further suggests that regional clusters significantly foster entrepreneurial activity (Delgado et al., 2010; Fundeanu and Badele, 2014; Biggeri et al., 2022) and that entrepreneurship contributes to cluster development, size, and strength (Zhu et al., 2019). However, despite these insights, no bibliometric analysis has been conducted that systematically explores entrepreneurship in relation to clusters—whether industrial, handicraft, or handloom—thus leaving a significant research gap for future investigation. There exist a substantial body of review-based studies on industrial clusters (Navdi & Schmitz, 1994; Basant, 2002; Lund-Thomsen & Pillay, 2012) and on entrepreneurship (Aggarwal & Johal, 2021; Islas-Moreno et al., 2021; Raman et al., 2022; Dhinakaran et al., 2023; Kraus et al., 2023; Uriarte et al., 2025).

However there remains a noticeable gap in the previous literature concerning the integration of these two fields through bibliometric approaches. This absence limits our understanding of how research in these fields is interconnected, where knowledge gaps persist, and what potential directions can be identified for policy and practice. Thus, a more in-depth bibliometric analysis of studies connecting entrepreneurship and clusters is timely and warranted. Addressing this gap through bibliometric analysis is therefore essential to systematically uncover patterns, collaborations, and evolving themes at the intersection of entrepreneurship and clusters, ultimately contributing new insights for both academia and regional development strategies. Thus, the main objective of this study is to conduct a bibliometric exploration of research linking all types of clusters with entrepreneurship. The study attempts to address the following research questions (RQs): RQ1: What is the current publication trend in entrepreneurship and clusters studies? RQ2: What is the current citations trend in entrepreneurship and clusters studies? RQ3: Who are the

most influential authors on entrepreneurship and clusters studies? RQ4: Which are the most influential journals on entrepreneurship and clusters studies? RQ5: Which are the most influential field of research on entrepreneurship and clusters studies? RQ6: Which are the most influential articles on entrepreneurship and clusters studies? RQ7: Which themes involving entrepreneurship and clusters are the most popular among scholars? All these seven dimensions would be able to provide comprehensive dataset of available research which is required for conducting a Systematic Literature Review (Ameen et al., 2022; Raman et al., 2022).

The rest of this paper is structured as follows: the subsequent section details the research methodology and procedures adopted. This is followed by three sections that sequentially present the findings, engage in a critical discussion of the results, and conclude with the implications and limitations of the study.

2. Methodology

This study employed the bibliometric review method, a widely used approach for examining the evolution and structure of a research domain. Bibliometric analysis is particularly effective in identifying the origins, development, and thematic patterns of scholarly fields through the use of quantitative indicators and visualization techniques (Li, Wu, & Wu, 2017; Valtakoski, 2020; Mahajan & Bandyopadhyay, 2021; Raman et al., 2022). The Dimensions database was chosen as the main source of bibliographic information for the study because it is publicly available, does not require a subscription and of its wide coverage of journals, books, conference proceedings, and patents from several disciplines, which makes it ideal for cross-domain analysis. For data visualization and mapping, VOSviewer software was utilized, as it provides robust tools for constructing and analyzing bibliometric networks, including co-authorship, co-citation, and bibliographic coupling, thereby allowing the identification of research clusters and intellectual linkages within the field. Furthermore, the study used the Scientific Procedures and Rationales for Systematic Literature Reviews (SPAR-4-SLR) protocol, which has gained recognition as a rigorous and transparent framework for conducting evidence-based reviews and which enhances the systematicity and replicability of bibliometric research by offering a structured process (Paul et al., 2021). SPAR-4-SLR is divided into three stages: assembling, arranging, and assessing. These stages are further subdivided into six methodological steps: identification, acquisition, organization, purification, evaluation, and reporting (Paul et al., 2021). Employing this protocol strengthens the methodological rigor of the study by ensuring both comprehensive coverage and quality control in data selection and analysis. Table 1 provides an overview of these six sub-stages and their application in this research.

Table 1. Three main stages of SPAR-4-SLR protocol

Sub-Stage 1: Identification	
Domain – Clusters and Entrepreneurship	

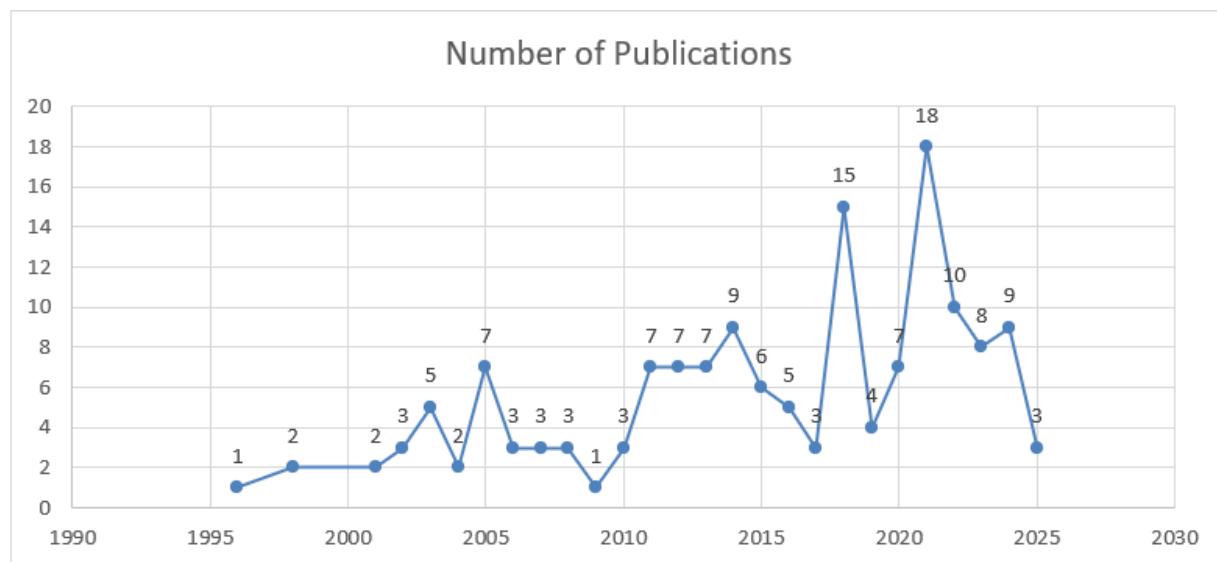
	Research Questions –
	Source type – peer-reviewed published conceptual and empirical research articles
	Source Quality – Dimensions
Stage 1: Assembling	Sub-Stage 2: Acquisition
	Source mechanism – Dimensions
	Search keywords – ("entrepreneur" OR "entrepreneurship") AND ("handicraft clusters" OR "handloom clusters" OR "industrial clusters" OR "geographical clusters")
	Search confined to subjects – All Discipline
	Articles returned from search - 231 research papers
	Sub-Stage 3: Organization
	Organizational framework – Not Applicable
Stage 2: Arranging	Organizational codes – publication title, journal name, author name, country of affiliation, number of citations, number of publications, author keywords
	Sub-Stage 4: Purification
	Article type excluded – 76 papers were excluded based on title and abstract assessments.
	Total Articles included – 155
	Sub-Stage 5: Evaluation
Stage 3: Assessing	Analysis method – Bibliometrics analysis and VOSviewer
	Agenda proposal method – Thematic analysis
	Sub-Stage 6: Reporting
	Reporting convention – Tables, Figures, Words

3. Results

3.1 Research Question 1: Trends of Publication

The pattern of research output on entrepreneurship and clusters between 1996 and 2025 (figure 1) shows a steady rise in academic interest over time, followed by a period of fluctuation. During the initial years (1996–2004), the number of publications remained low, indicating that the subject was still emerging in academic discourse. From 2005 onwards, the volume of research began to grow more consistently, with notable increases in the early 2010s and a peak of nine publications in 2014. The field gained significant momentum in 2018, with 15 publications, and reached its highest point in 2021 with 18 publications. After 2021, the numbers declined, falling to 10 in 2022, 8 in 2023, and 9 in 2024. The reason for this decline could be that the topic of “entrepreneurship and clusters” has reached a stage of conceptual saturation, with foundational frameworks already established and fewer novel contributions being made.

Figure 1. Number of Publications year wise

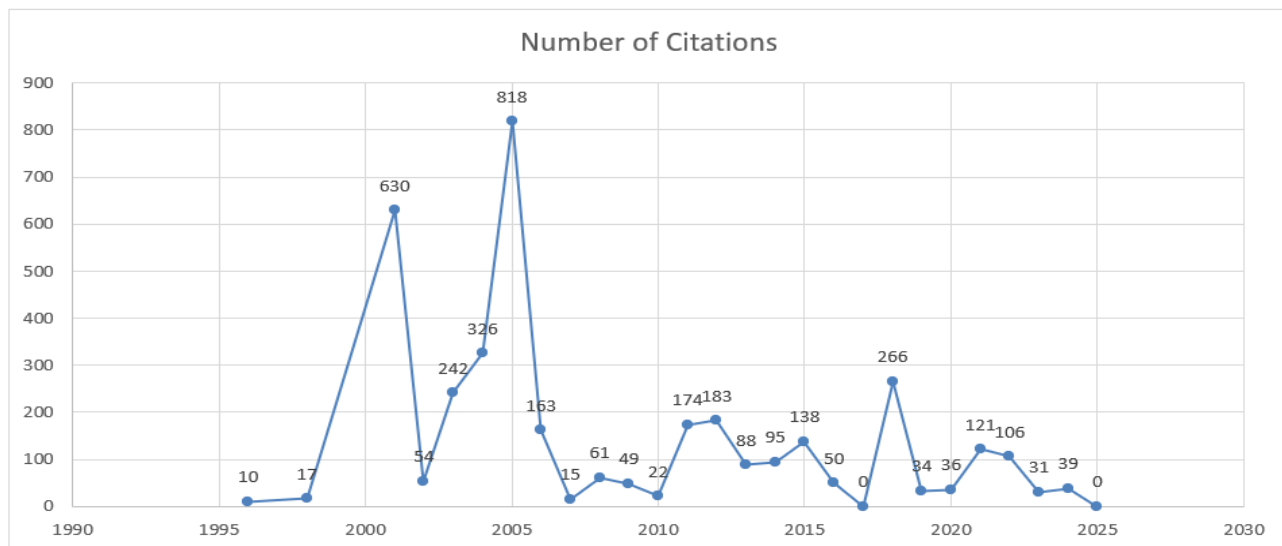


3.2 Research Question 2: Trend in Citations of publications

The citation trend for research on entrepreneurship and clusters from 1996 to 2025 (figure 2) reveals distinct peaks and fluctuations, reflecting varying levels of scholarly impact over time. In the early period, citations were modest, but a sharp rise occurred in 2001 with 630 citations, followed by another major peak in 2005 at 818 citations, suggesting influential publications or highly cited foundational studies during these years. Subsequent years saw moderate citation activity, with notable highs in 2003 (242), 2004 (326), 2011 (174), and 2012 (183). After 2015,

citation counts became more variable, with a significant increase in 2018 (266). The following years showed a general decline, with 121 citations in 2021, 106 in 2022, and further drops in 2023 (31) and 2024 (39). This decline in citations could be the shift in academic attention which might have moved toward emerging themes such as digital entrepreneurship, innovation ecosystems, sustainability, or regional resilience, which are extensions or evolutions of cluster research. Overall, the data suggests that while certain years produced highly influential research, the recent trend points to a more dispersed citation pattern, potentially reflecting diversification of related research topics.

Figure 2. Trend in number of citations year wise



3.3 Research Question 3: Top Contributing Authors

3.3.1 Top 10 authors on the basis of publications

Table 2 highlights the most active authors in the field of entrepreneurship and clusters along with their countries and total publications. Tetsushi Sonobe from Japan leads with five publications, making him the most prolific contributor in this dataset. Several authors, including Rama Ramswamy and N V R Jyoti Kumar from India, Mario Biggeri, Lisa Braitto, and Cristina Boari from Italy, Sana Ullah from Lebanon, Xiaobo Zhang from China, and Babur Wasim Arif from Pakistan, each have three publications, indicating a balanced level of research engagement across different countries. Huanhuai Zhou from China has two publications, slightly lower than the others on the list. Overall, the data suggests that research on this topic is internationally diverse, with notable contributions from Asia, Europe, and the Middle East, and Italy appearing prominently with three different authors in the top group.

Table 2. Top 10 authors on the basis of publications

Author Name	Country	Total Publications
Tetsushi Sonobe	Japan	5
Rama Ramswamy	India	3
Mario Biggeri	Italy	3
N V R Jyoti Kumar	India	3
Sana Ullah	Lebanon	3
Xiaobo Zhang	China	3
Lisa Brait	Italy	3
Babur Wasim Arif	Pakistan	3
Cristina Boari	Italy	3
Huanhuai Zhou	China	2

3.3.2 Top 10 Authors on the Basis of Citations

Table 3 presents the top-cited authors in the field of entrepreneurship and clusters, showing both their country affiliations and total citation counts. Janet L. Bercovitz and Maryann P. Feldman from the United States lead with 488 citations each, indicating highly influential research contributions. Matthew C. Sonfield and Robert N. Lussier, also from the United States, follow with 212 citations each, suggesting another significant research partnership or thematic alignment. Tetsushi Sonobe from Japan ranks next with 191 citations, closely followed by his compatriot Yukichi Y. Mano with 169 citations, reflecting strong Japanese contributions to the field. Italian scholars Sabrina Lucia Di Addario and Guido De Blasio share 164 citations each, pointing to impactful work in the European context. Patil Balachandra from India has 156 citations, marking notable influence from the South Asian region, while Yutaka Yoshino from the United States rounds out the list with 149 citations. Overall, the citation distribution reflects a concentration of highly influential scholars in the United States, complemented by significant contributions from Japan, Italy, and India.

Table 3. Top 10 Authors on the Basis of Citations

Authors	Country	Total Citations
Janet L Bercovitz	United States	488
Maryann P Feldman	United States	488
Matthew C Sonfield	United States	212
Robert N Lussier	United States	212
Tetsushi Sonobe	Japan	191
Yukichi Y Mano	Japan	169

Sabrina Lucia Di Addario	Italy	164
Guido De Blasio	Italy	164
Patil Balachandra	India	156
Yutaka Yoshino	United States	149

Overall, Tables 2 and 3 show that high productivity does not necessarily translate into high citation impact since leading authors as per citations are mostly from the United States despite not appearing among the most prolific authors as per publication count. While the publications list reflects broader international participation, the citation list is dominated by U.S.-based scholars.

3.4 Research Question 4: Top Influential Journals

3.4.1 Top 10 Influential Journals on the Basis of Publications

Table 4 shows that research on entrepreneurship and clusters is concentrated in a few leading outlets, with Entrepreneurship and Regional Development at the forefront, publishing 7 papers. Technological Forecasting and Social Change follows with 5 publications, highlighting the intersection of entrepreneurial studies with future-oriented and innovation research. European Planning Studies ranks third with 4 papers, suggesting a strong spatial and policy dimension in the literature. Several other journals, including Journal of the Knowledge Economy, Small Business Economics, The Journal of Entrepreneurship, and SEDME, each have 3 publications, reflecting diverse approaches ranging from economic development to SME management. The presence of specialized outlets like Journal of the Social and Economic History Society, alongside broader interdisciplinary journals like The Journal of Development Studies, with 2 publications each, indicates that the topic attracts attention from both narrowly focused entrepreneurship journals and broader socio-economic research platforms. Overall, while a handful of journals dominate output, the spread across various publication venues suggests a multidisciplinary interest in the subject.

Table 4. Top 10 influential journals on the basis of publications

Journal Name	Total Publications
Entrepreneurship and Regional Development	7
Technological Forecasting and Social Change	5
European Planning Studies	4
Journal of the Knowledge Economy	3
Small Business Economics	3
The Journal of Entrepreneurship	3
SEDME (Small Enterprises Development Management & Extension Journal) A worldwide window on MSME Studies	3
Journal of the Social and Economic History Society	2



DECISION	2
The Journal of Development Studies	2

3.4.2 Top 10 Influential Journals Based on Citations

Table 5 presents the top ten journals ranked on the basis of total citations, indicating their influence and relevance in the research domain. Industrial and Corporate Change leads with 576 citations, followed by Regional Studies with 488 citations, showing their significant dominance in the field. Mid-ranked journals include Family Business Review (212 citations) and Technological Forecasting and Social Change (197 citations), reflecting their moderate but notable impact. Several journals share close citation counts, such as World Development and Entrepreneurship and Regional Development, both with 176 citations, and Journal of Regional Science with 164 citations. The remaining journals—Energy (156), European Planning Studies (148), and Journal of Economic Geography (118)—occupy the lower end of the citation spectrum, yet still contribute meaningfully to scholarly discourse

Table 5. Top 10 Influential Journals Based on Citations

Journal Name	Total Citations
Industrial and Corporate Change	576
Regional Studies	488
Family Business Review	212
Technological Forecasting and Social Change	197
World Development	176
Entrepreneurship and Regional Development	176
Journal of Regional Science	164
Energy	156
European Planning Studies	148
Journal of Economic Geography	118

Tables 4 and 5 show that the core leaders remain unchanged, the middle ranks display slight reordering and closer competition in citation performance.

3.5 Research Question 5: Major Field of Research

3.5.1 Top 10 contributing field of research based on publications

Table 6 shows that research output is most concentrated in Commerce, Management, Tourism and Services with 76 publications, followed by Strategy, Management and Organisational Behaviour with 58 publications, indicating a strong emphasis on business-oriented disciplines. Human Society ranks third with 45 publications, reflecting significant scholarly interest in social aspects.



Fields like Economics (24 publications), Development Studies (21), and Applied Economics (18) show moderate representation, suggesting balanced attention between theoretical and applied economic research. Meanwhile, Policy and Administration (10), Econometrics (8), Human Geography (8), and Economic Theory (7) occupy the lower end, implying more specialized or niche research focus areas with comparatively fewer publications. Overall, the pattern reveals a dominant focus on management and business-related fields, complemented by moderate engagement in economics and social sciences, with technical and theoretical fields attracting smaller but steady scholarly contributions.

Table 6. Top 10 Contributing Field of Research Based on Publications

Field of Research	Total Publications
Commerce, Management, Tourism and Services	76
Strategy, Management and Organisational Behaviour	58
Human Society	45
Economics	24
Development Studies	21
Applied Economics	18
Policy and Administration	10
Econometrics	8
Human Geography	8
Economic Theory	7

3.5.2 Top 10 Contributing Field of Research Based on Citations

Table 7 highlights that Commerce, Management, Tourism and Services leads by a significant margin with 1,971 citations, closely followed by Strategy, Management and Organisational Behaviour with 1,833 citations, reflecting the strong academic influence of research in business and organizational studies. Human Society ranks third with 1,156 citations, showing substantial impact in social sciences. Economics-related fields also demonstrate considerable influence, with Economics (962 citations) and Applied Economics (923 citations) securing mid-tier positions. Human Geography holds 782 citations, while environment disciplines—Built Environment and Design (507) and Urban and Regional Planning (505)—reflect moderate but notable scholarly engagement. Lower citation counts are observed in Development Studies (297) and Econometrics (195), indicating more specialized research areas with narrower citation reach.



Table 7. Top 10 Contributing Field of Research Based on Citations

Field of Research	Total Citations
Commerce, Management, Tourism and Services	1971
Strategy, Management and Organisational Behaviour	1833
Human Society	1156
Economics	962
Applied Economics	923
Human Geography	782
Built Environment and Design	507
Urban and Regional Planning	505
Development Studies	297
Econometrics	195

Overall, Tables 6 and 7 shows that the hierarchy of research influence is largely stable, with only marginal citation shifts rather than major ranking changes.

3.6 Research Question 6: Citation Analysis

Citation analysis act as a fundamental method for evaluating the influence of scholarly works (Baumgartner & Pieters, 2003; Stremersch, Verniers, & Verhoef, 2007; Ding & Cronin, 2011). It is based on the premise that citations represent intellectual connections established when one study references another (Appio, Cesaroni, & Di Minin, 2014). Within this framework, the significance of a publication is primarily assessed through the frequency of citations it accumulates (Donthu et al., 2021).

The citation analysis represented by table 8 reveals that Feldman (2001) is the most influential work with 576 citations, followed by Feldman et al. (2005) with 488 citations, together accounting for a substantial share of the total citations among the top ten articles. Sonfield and Lussier (2004) (212 citations) and De Blasio and Di Addario (2005) (164 citations) also demonstrate significant scholarly impact, while works by Nagesha and Balachandra (2006) (156 citations) and Mano et al. (2012) (149 citations) maintain notable relevance. The remaining studies, including Hakanson (2005), Sternberg and Litzenberger (2004), Xie et al. (2018), and Benito et al. (2003), each with over 88 citations, reflect steady contributions to the field. Overall, the citation distribution is skewed, with the top two works dominating scholarly attention, indicating their foundational role in shaping subsequent research.

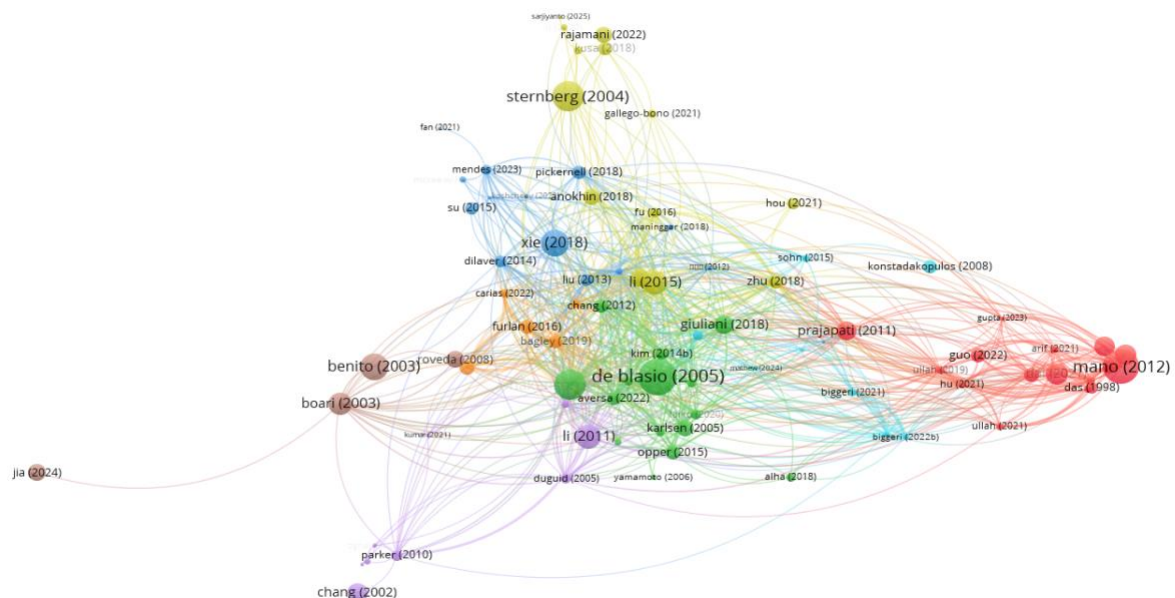
Table 8. Top 10 Articles Based on Citations

Article	Citations
Feldman (2001)	576
Feldman et al. (2005)	488
Sonfield and Lussier (2004)	212
De Blasio and Di Addario (2005)	164
Nagesha and Balachandra (2006)	156
Mano et al. (2012)	149
Hakanson (2005)	117
Sternberg and Litzenberger (2004)	114
Xie et al. (2018)	88
Benito et al. (2003)	88

3.7 Research Question 7: Bibliographic Coupling

Bibliographic coupling measures the extent to which two research papers cite the same references. It is applied to examine the connections among scholarly works in order to trace the historical evolution or the current progress of topics within a particular research domain (Donthu et al., 2021). The underlying premise is that when two documents share a significant number of references, they are likely to address related subject matter (Kessler, 1963; Weinberg, 1974). This method of analysis identified eight distinct clusters of publications that are most closely related in terms of meaning and theme, as illustrated in Figure 3.

Figure 3. Bibliographic coupling network



Cluster 1 (red) consists of 16 publications; Cluster 2 (green) also contains 16 publications; Cluster 3 (dark blue) includes 14 publications; Cluster 4 (yellow) comprises 13 publications; Cluster 5 (purple) has 9 publications; Cluster 6 (light blue) is formed by 8 publications; Cluster 7 (orange) consists of 6 publications; and Cluster 8 (brown) contains 5 publications.

Table 9 shows the top ten documents on the basis of total link strength. The overall link strength indicates how many references are co-cited between two publications.

Table 9. Top Ten Documents Based on Total Link Strength

Publication	Cluster	Total Link Strength	Total Citations
Presutti et al. (2013)	4	108	42
Li et al. (2015)	4	93	74
Hakanson (2005)	2	89	117
Zhu et al. (2018)	4	85	27
Bagley (2019)	7	76	23
Aversa et al. (2022)	2	74	21
Biggeri et al. (2022a)	6	71	3
Li et al. (2011)	5	68	72
Yan et al. (2011)	3	67	6
Liu et al. (2013)	3	67	18

Table 9 highlights the top ten publications on the basis of their total link strength, which measures how strongly each document is connected within the research network. Notably, Presutti et al. (2013) has the highest link strength, signifying its central role in linking various studies, even though its citation count is moderate. Li et al. (2015) and Hakanson (2005) also demonstrate strong link strengths, with Hakanson's publication having the highest citations, indicating both wide recognition and influence. A significant observation is that many of these key publications belong to cluster 4, emphasizing this cluster as a prominent thematic group within the field with tightly interconnected research. Other clusters, such as 2, 3, 5, 6, and 7, are also represented, showing the diversity of influential work across different topics. Some documents with high link strength but fewer citations suggest their important role in bridging research areas and maintaining the cohesion of the scholarly network. Overall, the clusters underline thematic concentrations, with cluster 4 emerging as a central hub in this academic domain.

Figure 3 presents eight clusters, which are examined further to identify their thematic focus. Table 8 lists the top three publications from each cluster, ranked according to their total link strength.

Table 10. Cluster analysis on the basis of the bibliographic coupling of publications.

Cluster	Color	Publications	Total Link Strength	Total Citations	Name of Publication	Main Theme
1	Red	Ullah et al. (2019)	56	9	“Education, experience, social network and firm survival: the case of the electrical fittings cluster in Sargodha, Pakistan”	Role of Education, Experience, and Social Networks in Strengthening Firm Survival and Entrepreneurial Entry within Industrial Clusters in Developing Economies
		Arif and Sonobe (2012)	56	9	“Virtual Incubation in Industrial Clusters: A Case Study in Pakistan”	
		Arif and Ullah (2021)	55	7	“From subcontractors to company owners: modeling firm-type choices in industrial clusters”	
2	Green	Hakanson (2005)	89	117	“Epistemic Communities and Cluster Dynamics: On the Role of Knowledge in Industrial Districts”	Knowledge, Emotions, and Regional Context as Drivers of Industrial Cluster Formation and Growth
		Aversa et al. (2022)	74	21	“The Primordial Soup: Exploring the Emotional Microfoundations of Cluster Genesis”	
		Kim (2014b)	67	18	“Regional Advantage of Cluster Development: A Case Study of the San Diego Biotechnology Cluster”	
3	Dark Blue	Yan et al. (2011)	67	6	“Entrepreneurship and an Apprentice-based Cluster: The Evolution of Houli's Saxophone Cluster in Taiwan”	Entrepreneurship as a Catalyst for the Formation, Development, and Transformation of Industrial Clusters
		Liu et al. (2013)	67	18	“Industrial cluster, government agency and entrepreneurial development”	
		Dilaver et al. (2014)	46	17	“Entrepreneurship and the emergence of industrial clusters”	
4	Yellow	Presutti et al. (2013)	108	42	“Inter-organizational geographical proximity and local start-ups' knowledge acquisition: a contingency approach”	The Interplay of Geography, Networks, and Entrepreneurial Capacity in Shaping

5	Purple	Li et al. (2015)	93	74	“Entrepreneurial networking capacity of cluster firms: a social network perspective on how shared resources enhance firm performance”	Industrial Cluster Performance and Growth
		Zhu et al. (2018)	85	27	“Entrepreneurship and industrial clusters: evidence from China industrial census”	
		Li et al. (2011)	68	72	“Network dynamics and cluster evolution: changing trajectories of the aluminium extrusion industry in Dali, China”	Network Relations, Competitive-
		Antolín-lópez et al. (2013)	54	7	“Cooperation And Competition as Antecedents of Product Innovation. Is There a Different Logic for New Ventures and Incumbents?”	Cooperative Dynamics, and the Evolutionary Trajectories of Industrial Clusters
		Duguid (2005)	35	12	“Introduction: The Changing Organization of Industry”	
6	Light Blue	Biggeri et al. (2022a)	71	3	“Chinese migrant microenterprises and social capital: a multiple case study analysis in industrial clusters in Italy”	The Role of Social Capital and Cluster Dynamics in Migrant and Local Entrepreneurship
		Biggeri and Braito (2022b)	63	4	“Chinese microentrepreneurs in industrial cluster in Italy: analysis of the ethnic microenterprises performance”	
		Luo et al. (2020)	41	12	“Cluster status and new venture creation”	
7	Orange	Bagley (2019)	76	23	“Networks, geography and the survival of the firm”	The interrelation of spinoff formation, inherited and socially acquired resources, and geographic proximity in explaining firm survival, performance, and the emergence of industrial clusters.
		Furlan and Grandinetti (2016)	56	26	“Spinoffs and their endowments: beyond knowledge inheritance theory”	
		Carias et al. (2022)	45	8	“Entrepreneurship, the initial labor force, and the location of new firms”	

8	Brown	Boari et al. (2003)	37	62	“Clusters and rivalry: does localization really matter?”	Linking localization, innovation processes, and inter-firm dynamics to the competitiveness and evolution of industrial clusters across diverse sectors
		Roveda and Vecchiato (2008)	14	39	“Foresight and innovation in the context of industrial clusters: The case of some Italian districts”	
		Benito et al. (2003)	4	88	“A cluster analysis of the maritime sector in Norway”	

4. Findings

The study makes a deliberate effort to systematically examining the intersection of entrepreneurship and clusters through bibliometric analysis. In doing so, it provides a detailed understanding of current publication and citation trends, identifies the most influential authors and journals driving research in this area, highlights the prominent research fields and highly cited articles shaping the discourse, and uncovers the key thematic areas that have garnered significant scholarly attention. This approach not only maps the structure and evolution of research connecting entrepreneurship and clusters but also reveals potential directions for future investigation, policy formulation, and practical application in regional development contexts. For Research Question 1: The bibliometric analysis reveals a steady growth in research on entrepreneurship and clusters from 1996 to 2025. Early years (1996–2004) show limited output, indicating an emergent field. From 2005, publications increased progressively, with peaks in 2014 (9 publications) and 2021 (18 publications), reflecting heightened scholarly interest. Post-2021, publication numbers declined slightly, suggesting thematic diversification or the emergence of related subfields. Overall, the trend confirms sustained academic attention toward the intersection of entrepreneurship and cluster studies. For Research Question 2: Citations of publications in this domain show variable peaks over the years. Early foundational studies received notable attention, such as the spikes in 2001 (630 citations) and 2005 (818 citations). Later years witnessed fluctuating citation patterns, with significant influence observed in 2018 (266 citations) but declines post-2021. This suggests that while seminal works continue to shape the field, newer studies diversify thematic focus, leading to dispersed citation impact. For Research Question 3: The analysis identifies Tetsushi Sonobe (Japan) as the most prolific author with five publications, followed by a cohort of authors from India, Italy, Lebanon, China, and Pakistan, each contributing three publications. Citation-based influence, however, is dominated by U.S.-based scholars, with Janet L. Bercovitz and Maryann P. Feldman receiving 488 citations each. This distinction highlights that high productivity does not always equate to high scholarly impact, with the United States leading in influential research despite fewer publications. For Research Question 4: Research output is concentrated in a few journals. Entrepreneurship and Regional Development leads in publications (7), followed by Technological Forecasting and Social Change (5). Citation impact favors Industrial and Corporate Change (576 citations) and Regional Studies (488

citations). The results indicate that while specialized entrepreneurship journals drive output, interdisciplinary and high-impact journals shape scholarly influence. For Research Question 5: Business-related disciplines dominate, with Commerce, Management, Tourism, and Services (76 publications, 1,971 citations) and Strategy, Management, and Organisational Behaviour (58 publications, 1,833 citations) leading. Social sciences, economics, and applied economics show moderate representation, while specialized fields like policy, econometrics, and human geography contribute fewer publications but maintain academic relevance. For Research Question 6: Citation analysis reveals that Feldman (2001) is the most influential work (576 citations), followed by Feldman et al. (2005, 488 citations). Other significant studies include Sonfield & Lussier (2004) and De Blasio & Di Addario (2005), highlighting foundational research that underpins cluster-entrepreneurship studies. For Research Question 7: Bibliographic coupling identified eight thematic clusters, reflecting the diversity and interconnectedness of research. Cluster 4 (yellow) emerges as central, linking publications that explore the interplay of geography, networks, and entrepreneurial capacity in industrial clusters. Other clusters emphasize social capital, network dynamics, knowledge sharing, firm survival, and localization strategies. High link-strength publications, even with moderate citation counts, indicate their pivotal role in connecting research streams.

5. Conclusion

This study presents a systematic bibliometric analysis of research at the intersection of entrepreneurship and clusters, providing insights into publication trends, influential authors and journals, research fields, and thematic networks. The findings reveal that the field has grown steadily since the late 1990s, with peaks in publications and citations reflecting foundational works such as Feldman (2001) and Sonobe (2001), and subsequent contributions by De Blasio & Di Addario (2005), Sonfield & Lussier (2004), and others. Research on entrepreneurship and clusters is increasingly global and interdisciplinary. While earlier studies focused on industrial districts, knowledge spillovers, and network dynamics, recent scholarship expands into applied contexts, including artisan, handloom, and digital clusters. This reflects a shift from purely theoretical models to applied, policy-relevant studies with social and economic implications. While prolific authors are distributed internationally, citation impact is concentrated in the United States, indicating that influence does not always align with productivity. Leading journals such as *Industrial and Corporate Change* and *Regional Studies* continue to shape the field, complementing business and management-focused outlets that dominate publication output. Bibliographic coupling identified eight thematic clusters, highlighting consistent focus on networks, social capital, and entrepreneurship as drivers of cluster formation and performance. Cluster 4, in particular, emphasizes the integration of geographic proximity, inter-organizational networks, and entrepreneurial capacity, confirming and extending insights from foundational studies (Feldman et al., 2005; Li et al., 2015). Emerging themes such as digital entrepreneurship and regional artisan clusters demonstrate the field's evolving relevance to socio-economic development. Findings

reinforce that entrepreneurship within clusters contributes to regional economic growth, knowledge transfer, and cultural preservation, aligning with previous theoretical and empirical studies (Feldman, 2001; De Blasio & Di Addario, 2005; Rocha & Sternberg, 2005). Modern applications, particularly in artisan and handloom sectors, indicate the potential for policy interventions to strengthen cluster-based entrepreneurship for sustainable development. This study not only validates foundational insights from prior research but also uncovers contemporary trends and thematic linkages, providing a nuanced understanding of how entrepreneurship and clusters interact. The bibliometric perspective highlights gaps and opportunities for future research, particularly in emerging contexts such as digital and socially-driven clusters, and offers evidence-based guidance for policymakers and practitioners aiming to leverage clusters for innovation, regional development, inclusive growth, and entrepreneurship.

Despite its contributions, this study has few limitations. First, the analysis relies solely on the Dimensions database, which may not capture all relevant publications indexed elsewhere (e.g., Scopus, Web of Science). Second, the study focuses on quantitative bibliometric indicators, without qualitative assessment of content, limiting deeper interpretation of research narratives and practical outcomes. Future studies could address these limitations by incorporating multiple databases and combining bibliometric and qualitative analyses for a more comprehensive understanding of entrepreneurship-cluster interactions.

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