

Analyzing Descriptive and Content Structure of Scientific Outputs in the Field of Social Entrepreneurship

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Abstract

Entrepreneurship is an innovative and creative activity. Entrepreneurship is achieved by identifying, evaluating, and exploiting opportunities to create specific products. The present study aimed to analyze content structure of Social Entrepreneurship (SE) in the Web of Science (WoS) database. Scientific studies related to social entrepreneurship help to understand the scope of studies of that subject. The methodology of this study was scientometric analysis, which conducted co-word occurrence analysis focusing on SE. Data sourced from the Web of Science (WoS) database revealed a corpus of 4,292 documents related to software engineering (SE) from 1990 to 2024. The research findings reveal a diverse array of topics associated with SE in WoS publications, indicating academic diversity and a focus on American universities and various countries. Over the past two decades, SE research has transitioned from a nascent field to a well-established discipline. Key phrases such as "SE," "social enterprise", "entrepreneurship," "social innovation," "sustainability," and "innovation" emerge as the most frequent in SE literature on the WoS database. By doing this in the future, researchers can delve deeper into various aspects of SE, exploring emerging trends, innovative practices, and addressing pressing societal challenges.

Keywords: Co-Word Analysis, Social Entrepreneurship (SE), Scientific Outputs, Content Structure.

Introduction

Entrepreneurship is indeed an innovative and creative endeavor that involves identifying, evaluating, and capitalizing on opportunities to develop specific products or services (Ketchen, Ireland & Snow, 2007; Siegel, 2007). However, in contrast to traditional entrepreneurship,

social entrepreneurship (SE) carries an additional value burden and is centered on the creation of social value. SE focuses on addressing social issues and making a positive impact on society while pursuing business goals (dos Santos Pedrosa, Silva, Corrêa, & De Carvalho, 2021; Sentürk & Mengü, 2020; Vinogradova, Maloletko, & Shatsky, 2017).

SE is characterized by its ability to engage in constructive and collaborative interactions with other organizations and institutions. Integration emerges as a key feature, enabling the creation of productive value through connections with both internal and external elements of non-profit, productive, and public organizations. At the heart of SE lies the pursuit of combinatorial social value, setting it apart from egocentric business entrepreneurship. Social value serves as the central goal and driving force, giving SE its distinctive identity (Betts, Lund & Kretinin, 2018; Carneiro, 2023). Studies on SE reveal its multifaceted nature, progressing from an individual focus to encompass innovative, institutional, and societal dimensions. This evolution reflects the interplay between social and cultural contexts, as well as the individual and creative aspects of entrepreneurs. Gradually, SE establishes itself as a dynamic field at the intersection of social, cultural, and entrepreneurial dynamics (Conway Dato-On & Kalakay, 2016).

In the eyes of economists, entrepreneurship is intricately linked to the notion of "creating productive value," which manifests in various forms such as productive economic activity, job creation, income generation, and the promotion of entrepreneurship itself (Szerb, Ortega-Argilés, Acs & Komlósi, 2020). This concept aligns closely with economic dynamism, particularly within the Austrian school of thought, which emphasizes the significance of innovation, risk-taking behavior, and the innate desire for progress and creativity among entrepreneurs, even in uncertain and hesitant conditions. Moreover, from a Schumpeterian institutionalist perspective, entrepreneurship is understood to create social value and is characterized by its "resource combining power." This approach highlights the ability of entrepreneurs to effectively leverage a diverse array of resources, including economic, human, social, and cultural dimensions, to mobilize investments towards significant economic objectives. In essence, entrepreneurship is seen as a dynamic force that not only drives economic growth but also shapes social and cultural landscapes, contributing to broader societal goals (Swanson & DeVereaux, 2017).

In principle, SE is founded upon Schumpeter's concept of combination. Within the realm of the social sciences and sociology, it is grounded in notions such as Weber's concept of charismatic authority and Granövetter's concept of "embeddedness". Entrepreneurship in the social sphere varies significantly among ethnic groups, immigrants, religious minorities, as well as among women and other professional and specialized groups such as doctors and craftsmen (Efendic, Andersson & Wennberg, 2016). Moreover, it takes on a distinct social character influenced by the institutional conditions of these groups. In essence, SE may exhibit diverse characteristics depending on the backgrounds, contexts, institutional conditions, and situational contexts within each society or group (Bacq & Janssen, 2011).

Studies have shown that the socioeconomic status (SES) of these immigrant groups varies depending on the social capital and structural conditions of both the source and destination countries. This entrepreneurship could result in employment opportunities, economic prosperity, and increased economic activity, even within the suburbs of destination cities (Baycan-Levent & Nijkamp, 2009; Fresnoza-Flot & Pécout, 2007; Rezaei & Goli, 2020; Stone & Stubbs, 2007).

Entrepreneurship, in its traditional sense, differs from SE. While both endeavor to identify business opportunities through various strategies, SE places a greater emphasis on creating and realizing entrepreneurial opportunities. Additionally, social entrepreneurs are more concerned with creating value rather than solely pursuing productive value. They act as agents of change, addressing market failures and serving the "bottom of the pyramid" of society. In this context, any company providing social services may be categorized as a social enterprise (SE). However, what distinguishes social entrepreneurs is their ability to generate sustainable social wealth and foster a culture of social entrepreneurship (Panum, Hansen, & Davy, 2018). Through their initiatives, they can have a profoundly positive impact on society, driving social change and inspiring others to pursue similar endeavors (Austin, Stevenson, & Wei-Skillern, 2006).

Evaluating the scientific output of universities, departments, and research organizations has long been a pertinent issue. With the advancement of knowledge, the increasing production of scientific research, and heightened competition in academia, it has become an indispensable and challenging task. One of the most prevalent methods for evaluating scientific output is through the use of scientometric techniques. Scientometric analysis of scientific publications has emerged as a crucial aspect of information science research in recent years. These studies aim to identify patterns in publications, writings, citations, and other relevant factors. By analyzing such data, scientometric studies facilitate a dynamic understanding of the field, enabling better access to and management of information. In essence, scientometric methods contribute to enhancing the efficiency and effectiveness of scientific research evaluation processes.

Scientometric analysis has garnered significant attention in recent decades as a means to assess the performance of researchers' inquiries and the growth of various disciplines. It serves as a valuable tool for identifying emerging research areas and evaluating the research performance of individual researchers, research groups, and countries. Scientometric studies play a crucial role in mapping the development and dissemination of scientific knowledge. They provide research managers at various levels with insights into the production, dissemination, and utilization of science, facilitating informed planning in the research field (Haghani, 2023). This study aims to analyze the descriptive and content structure of scientific documents produced by SE researchers in the Web of Science (WoS) database from 1990 to 2024 using scientometric methods. The objective is to shed light on the status of international participation in this field. Despite the significance of SE, no research has been conducted in the country to evaluate research studies in this area. This gap suggests that experts in the field may lack an accurate perspective on the scientific activities within their domain.

Amousa, Fazli, Arasti, and Elahi (2023) studied green entrepreneurship development, spanning the field-based scientometrics approach (2000-2022). Findings showed a notable upward trend in the number of articles published in this field. Key terms such as sustainable development, entrepreneurship, and green entrepreneurship emerged as the most frequent keywords, forming the basis for four distinct clusters based on word co-occurrence patterns.

Persaud and Bayon (2019) conducted a comprehensive analysis of dominant themes in SE (SE) research spanning 28 years from 1990 to 2018. Their study showed 101 articles, delineated three distinct periods: the nascent phase (1990-2002), the growth phase (2003-2010), and the maturity phase (2011-2018). During the early phase, the focal point was on the social entrepreneur at the individual level. In contrast, the subsequent growth phase witnessed a shift toward examining the organizational aspects of social entrepreneurship. In the final phase, there

was a notable emphasis on exploring the institutional and contextual dimensions of SE. Overall, key areas of interest for researchers in this field include social entrepreneurs, individuals, and communities; organizational social entrepreneurship; innovation and value creation in social entrepreneurship; and the foundational and contextual aspects of entrepreneurship.

Cozma and Buchansia (2020) studied SE outputs based on a scientometric method. Findings showed SE has a rich historical background, with its literature dating back nearly three decades. Over time, due to the presence of influential social entrepreneurs and the establishment of a cohesive knowledge system, social entrepreneurship (SE) has evolved into an economic, social, and even global phenomenon, occupying a distinct position within academic discourse. The findings showed that the concept of "social enterprise" received significant scholarly attention over eight years (2010-2018), while "small businesses" garnered emphasis in research studies spanning eleven years (2007-2018). Moreover, it was noted that a majority of the research on SE originates from economically developed countries, notably the United Kingdom and the United States. This trend underscores the global significance and relevance of SE, particularly in the context of advanced economies.

Khaseh and Habibi (2018) conducted a study on the structure of knowledge in the field of entrepreneurship using vocabulary co-occurrence analysis. Their investigation included identifying top researchers and analyzing trends in entrepreneurship research over time. Results showed a notable upward trend in entrepreneurship research. Vocabulary co-occurrence analysis revealed that keywords such as "Entrepreneurship," "SMEs," and "Innovation" had the highest frequency among all terms. Additionally, keyword pairs like "entrepreneurship-innovation," "entrepreneurship-self-employment," and "entrepreneurship-economic development" exhibited the highest co-occurrence.

Sassmannshausen and Volkmann (2018) studied Software Engineering (SE) and Its Establishment as a University, aiming to analyze the field of SE through scientometric methods. Their research offers a comprehensive examination of the current state of SE research and its integration into academic discourse. Through empirical analysis, the study reveals significant insights, including the exponential growth of research articles, the institutionalization of SE across various dimensions, the identification of thematic clusters, and methodological challenges faced by researchers. Additionally, the study presents a ranking of highly cited academic partnerships in SE. Overall, their study contributes to understanding the evolution and establishment of SE as a field of study, while also providing valuable insights into methodological considerations and publication trends within the discipline.

A review of existing literature reveals a gap in understanding various dimensions of scientific participation among researchers in the field of SE. To address this gap, the study focused on exploring the issues surrounding SE in universities and research centers, as well as their scientific outputs. The primary objective was to uncover the levels of scientific cooperation among researchers in universities and to map out the resulting scientific collaborations between universities and research centers. By doing so, the study aimed to identify trends in knowledge development within this domain. The findings of this study have significant implications for essential research planning, enabling the identification and rectification of existing deficiencies and shortcomings. Moreover, they can inform efforts to promote scientific collaboration in emerging areas of SE, aligning with current national needs and priorities.

Research Questions

1. What is the annual growth trend of scientific publications in the field of SE?
2. Who are the most prolific authors, journals, and universities in the field of SE?
3. How have the leading authors in the field of SE performed over time?
4. What is the relationship between countries, universities, and keywords in the field of SE?
5. What is the status of scientific production in the field of SE regarding national and international collaborations?
6. What are the thematic clusters, the most frequently used keywords, and the status of topics in the field of SE in terms of density and centrality?

Materials and Methods

This study is descriptive and applied in nature, employing a scientometric approach. All research conducted in the field of SE up to 2024 was extracted and analyzed from the WoS. Search Strategy: TS= (“Social Entrepreneurship*”)

The search on Web of Science (WoS) retrieved 4,681 documents. The extracted data were analyzed using the *Bibliometrix* package and its graphical interface, *Biblioshiny*, a web-based tool. Bibliometrix is a package in RStudio, an integrated development environment for users of the R programming language, and is used for conducting quantitative bibliometric and scientometric studies. For visualization and topic analysis, the *VOSviewer* software was employed. This free software is used for mapping scientific networks and performing scientometric studies, enabling the analysis of data extracted from databases such as WoS, Scopus, PubMed, and Google Scholar.

Results

Annual Growth Trend

Figure 1 illustrates the annual growth trend of scientific publications in SE. According to the Figure, publications in this field began in 1990. Approximately half of the total publications were released by 2015. Overall, the publication trend in this field has shown a steady upward trajectory.

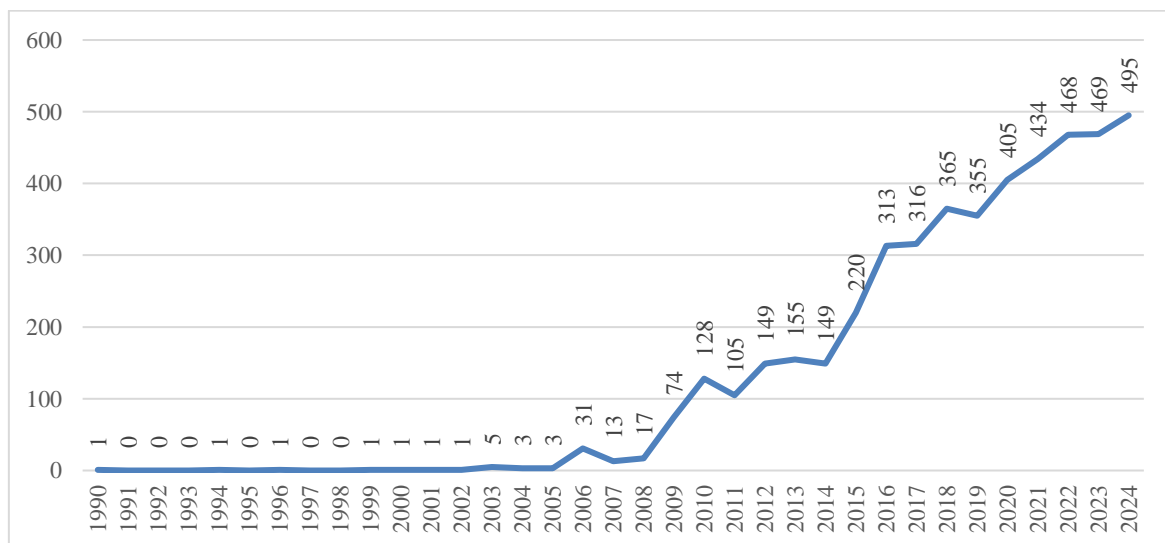


Figure 1: The annual growth trend of scientific publications in the field of SE in the WoS

Who are the most prolific authors, journals, and universities in the field of SE?

Table 1 shows the most prolific authors in this field. Tucker holds first place with 62 works. This individual has authored 6.82% of the publications in the area of SE. Following him, Tang and Mehta rank second and third with 53 and 42 works, respectively.

Table 1

The most prolific authors in the field of SE in the WoS database (1990–2024)

Row	Authors	Articles	Articles Fractionalized	Row	Authors	Articles	Articles Fractionalized
1	Tucker JD	62	6.82	6	Wu D	24	2.05
2	Tang W	53	5.03	7	Bacq S	22	7.69
3	Mehta K	42	12.12	8	Zhang Y	21	3.56
4	OngJJ	25	2.41	9	Kickul J	19	5.23
5	Na NA	24	24.00	10	Mair J	19	8.45

The journals that have published the most articles in the field of software engineering (SE) are listed in Table 2. The Journal of SE has the largest share, with 320 articles published in this field. Following it, the journals Sustainability, with 153 articles, and the Social Enterprise Journal, with 93 articles, are the most prolific.

Table 2

The most prolific journals in scientific publications in the field of SE in the WoS database (1990–2024)

Row	Sources	Articles
1	Journal of Social Entrepreneurship	320
2	Sustainability	153
3	Social Enterprise Journal	93
4	Journal of Business Ethics	84
5	Entrepreneurship & Regional Development	62
6	Voluntas	57
7	Journal of Business Venturing	49
8	Journal of Business Research	44
9	International Journal of Entrepreneurial Behavior & Research	42
10	Journal of Cleaner Production	38

In Figure 2, an analysis of co-authorship in studies of this field at the organizational collaboration level, considering a minimum of 5 publications for each institution, identified 18 clusters comprising 400 scientific centers and institutions. As indicated, Pennsylvania State University, the University of North Carolina, and the University of Oxford were recognized as the most prolific institutional affiliations among the scientific outputs in the field of SE.

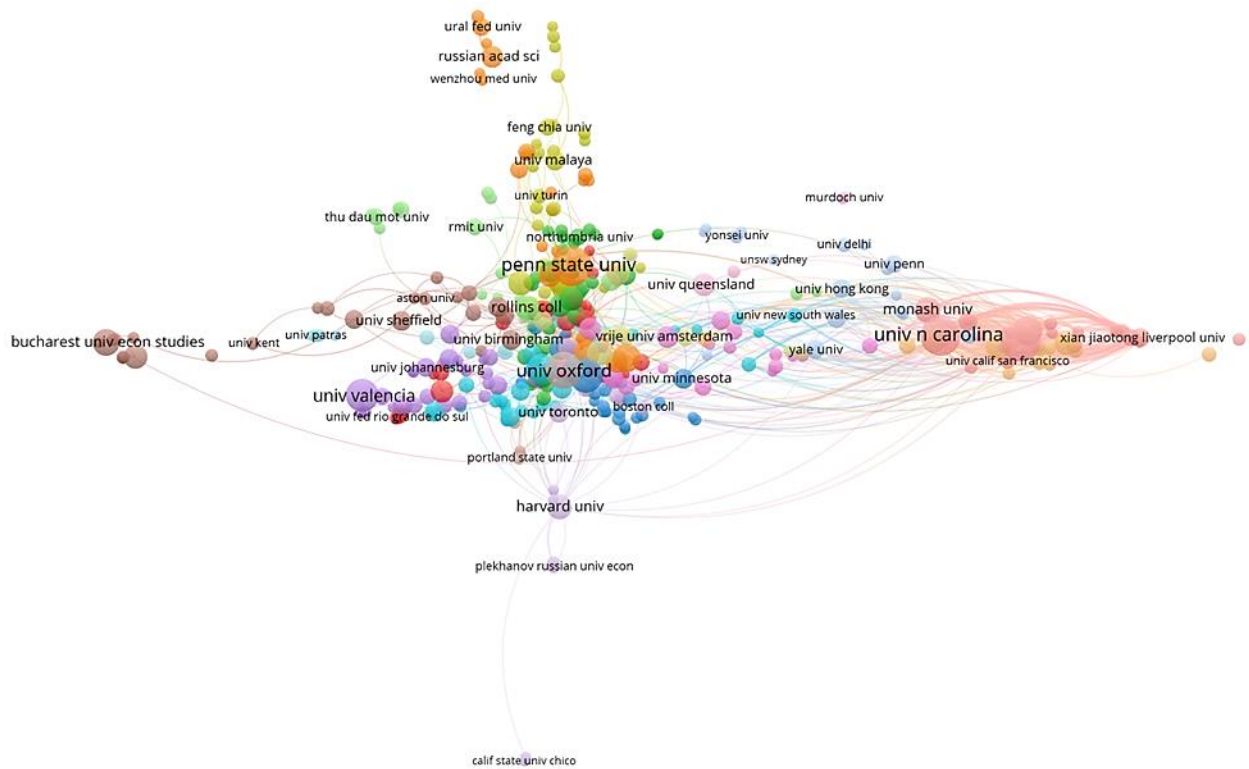


Figure 2: Scientific collaboration map of organizations in studies of the subject area of SE in the WoS database (1990–2024)

What has been the performance of the top authors in the subject area of SE over time?

Figure 3 illustrates the performance of authors in terms of the number of publications and the citation-to-year ratio throughout their academic careers. Each circle represents an author’s performance for a specific year, with the diameter of the circles indicating the number of articles published by the author and the prominence of the circle reflecting the citation ratio per year. According to the figure, the most-cited authors in this field are as follows: Meyer in 2006, with a total of 211,130 citations; Beck in 2018, with 286.79 citations; and Tucker in 2020, with 57.8 citations per year.

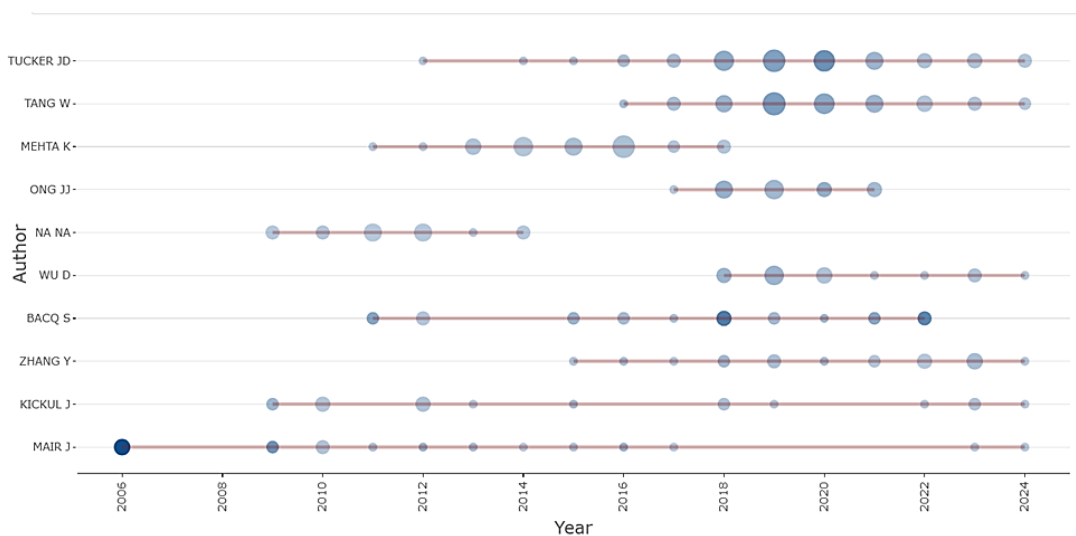


Figure 3: Performance of leading authors in the subject area of SE in the WoS database (1990-2024)

How are countries, universities, and keywords related in the subject area of SE?

Figure 4 features fields representing countries, universities, and keywords, illustrating the relationships among these elements. The size of each rectangle in the Figure indicates the degree of connection that element has with adjacent fields. For example, the rectangle representing the keyword “SE” has the highest elevation compared to rectangles for other keywords, suggesting that this keyword has the strongest connection with the country field. The keywords “Entrepreneurship” and “Social” follow in second and third place, respectively. According to Figure 4, the United States, China, and the United Kingdom have been the most active countries in the leading topics within this field. Additionally, the University of North Carolina, the London School of Hygiene and Tropical Medicine, and the University of Southern California have shown the highest level of involvement in these topics.

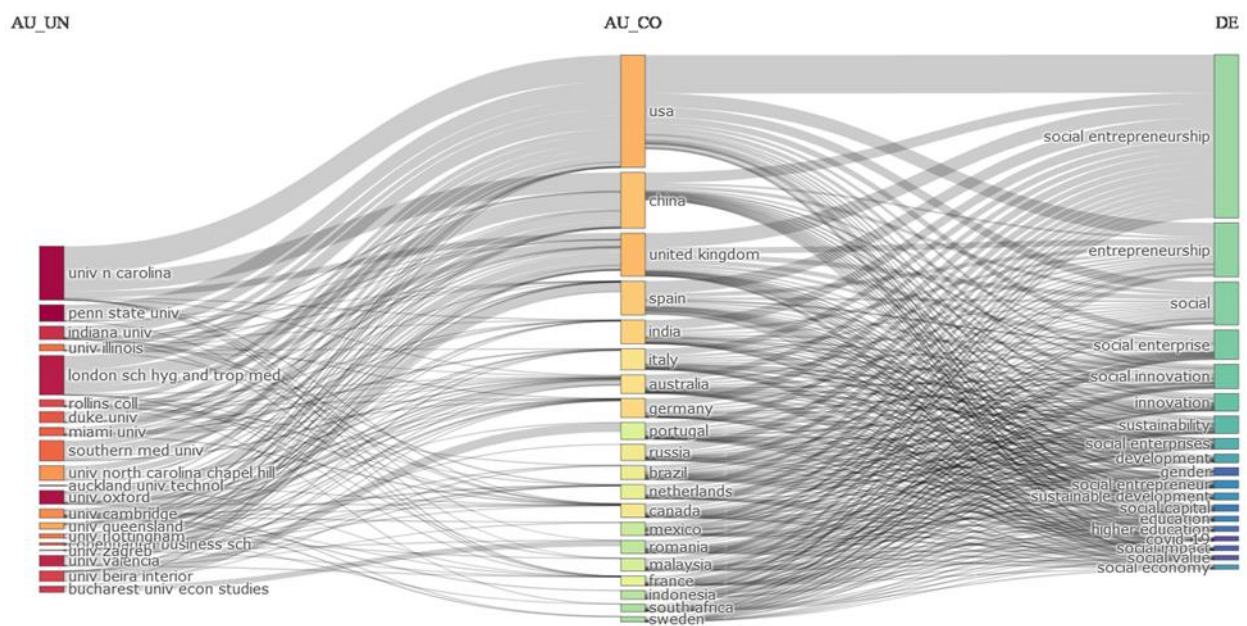


Figure 4: Conceptual diagram of keywords, countries, and universities in the scientific outputs of the subject area of SE in the WoS database (1990–2024)

What is the status of scientific productions in the field of SE in terms of national and international collaborations?

In Figure 5, an analysis of co-authorship of studies in this field at the country collaboration level was conducted, taking into account a minimum of five publications for each country. This analysis identified 9 clusters comprising 83 countries. Additionally, the United States, the United Kingdom, and China have the highest levels of collaboration among the countries.

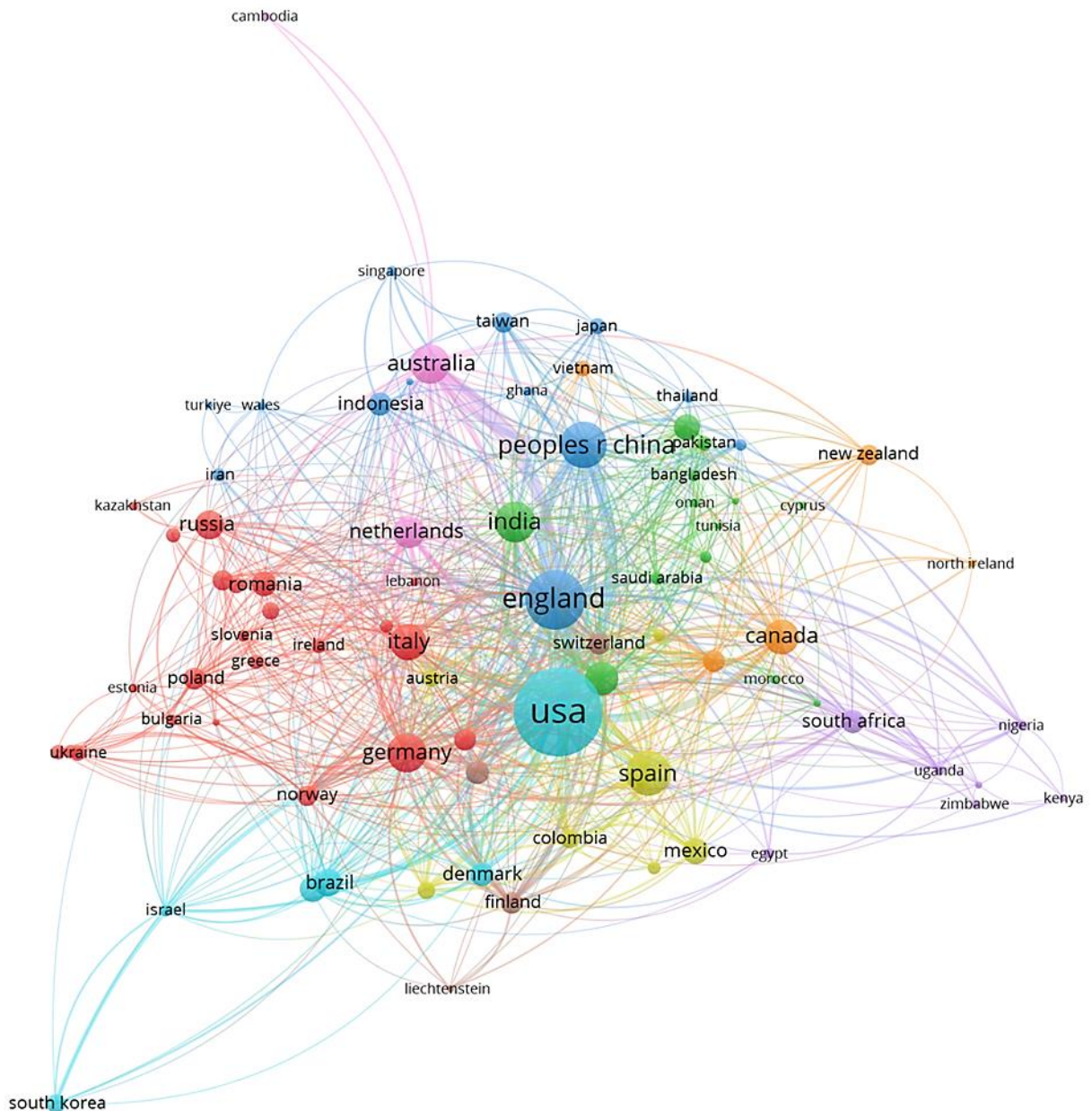


Figure 5: Scientific collaboration of countries in studies related to the field of SE in the WoS database (1990-2024)

Table 3 shows the countries of the corresponding authors. The United States has the highest number of articles, with 868 papers, of which 666 are the result of national collaboration and 202 from international cooperation. The United Kingdom ranks second, with 320 articles, comprising 190 national papers and 130 resulting from partnerships with other countries. Following the United Kingdom, China has 288 articles, with corresponding authors from China responsible for 172 of them, while 116 papers were produced in collaboration with other countries.

Table 3

Countries of corresponding authors for scientific outputs in the field of se in the WoS database (1990-2024)

Row	Country	Articles	SCP	MCP	Row	Country	Articles	SCP	MCP
1	USA	868	666	202	6	GERMANY	147	103	44
2	UNITED KINGDOM	320	190	130	7	ITALY	145	98	47
3	CHINA	288	172	116	8	AUSTRALIA	141	103	38
4	SPAIN	245	186	59	9	RUSSIA	110	99	11
5	INDIA	201	164	37	10	CANADA	107	67	40

What are the thematic clusters, the most commonly used keywords, and the status of the topics presented in the field of SE in terms of density and centrality?

Figure 6 illustrates the clustering of keywords. This diagram contains 51 keywords that are classified into 6 thematic clusters.

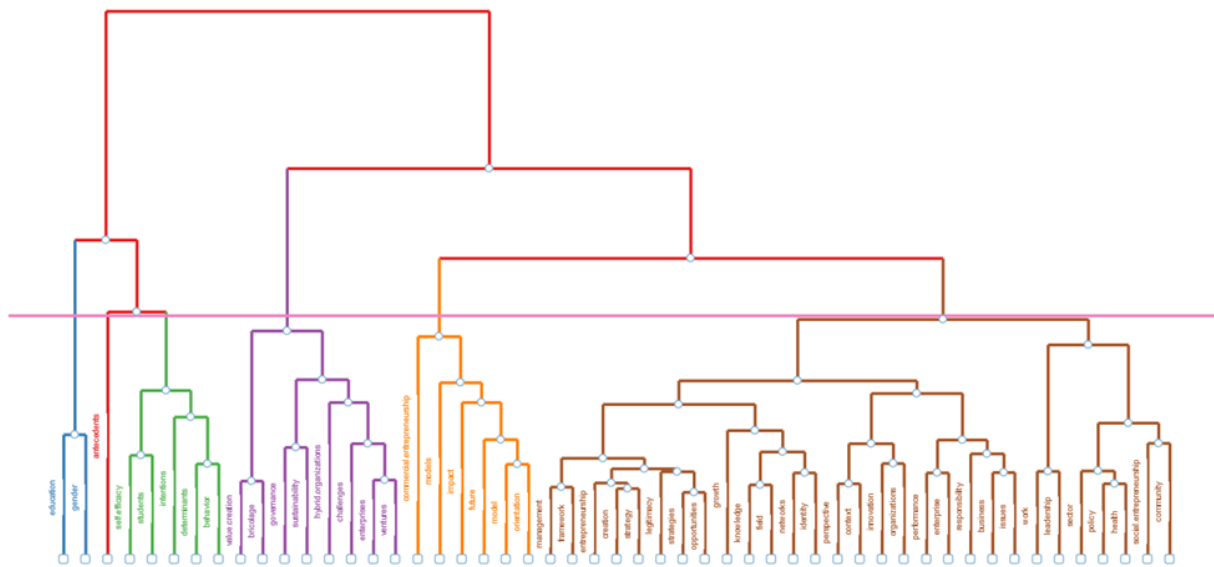


Figure 6: Thematic clustering of scientific outputs in the field of se in the WoS database (1990-2024)

Table 4 lists the members of each thematic cluster, with each cluster named based on its members. The first cluster represents social innovation. The second cluster relates to impactful entrepreneurship models; the third cluster addresses organizational sustainability and bricolage; the fourth cluster includes gender and education; the fifth cluster pertains to self-efficacy factors and student behavior, and the sixth cluster is related to predecessors.

Table 4

Thematic clustering of scientific outputs in the field of se in the WoS database (1990-2024)

Row	Cluster Name	Cluster Members
1	Social innovation	Social entrepreneurship/ entrepreneurship/ innovation/ performance/ enterprise/ business/ management/ organizations/ creation/ framework/ perspective/ responsibility/ strategies/ knowledge/ context/ growth/ legitimacy/ networks/ policy/ strategy/ sector/ work/ field/ opportunities/ issues/ community/ health/ identity/ leadership
2	Influential Entrepreneurship Models	Impact/ model/ future/ models/ orientation/ commercial entrepreneurship
3	Organizational sustainability and bricolage	Governance/ enterprises/ challenges/ hybrid organizations/ sustainability/ value creation/ bricolage/ ventures
4	Gender and education	Education/ gender
5	Self-efficacy factors and student behavior	Determinants/ Self-efficacy/ behavior/ intentions/ students
6	Antecedents	Antecedents

In Figure 7, the conceptual structure map of the thematic clusters introduced in Table 5 is depicted. In this Figure, the keywords located closer to the center are the ones that have gained significant attention in recent years. This Figure illustrates the relationships among the words and is based on the keywords from the WoS database. For instance, the orange cluster, which is introduced as the fifth cluster in Table 5, represents self-efficacy factors and student behavior.

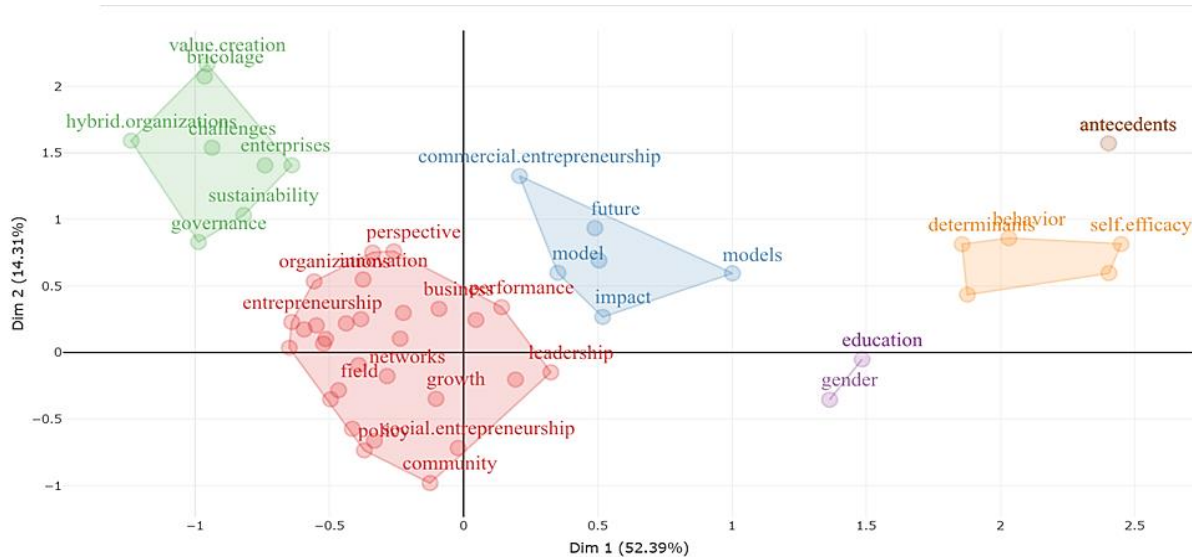


Figure 7: Conceptual structure map of scientific outputs in the field of SE in the WoS database (1990-2024)

Figure 8 illustrates the co-occurrence map of keywords in studies on the topic of software engineering (SE) based on temporal overlap. Considering a co-occurrence threshold of 5, a total of 11 clusters comprising 594 keywords were identified. The words ‘SE,’ ‘entrepreneurship,’

density but low centrality. The third quadrant (lower left area) encompasses topics with low density and centrality. These are emerging or waning topics, with corporate responsibility being one of them. The fourth quadrant (lower right area), representing fundamental topics, features low density but high centrality. This area includes the topic of social innovation.

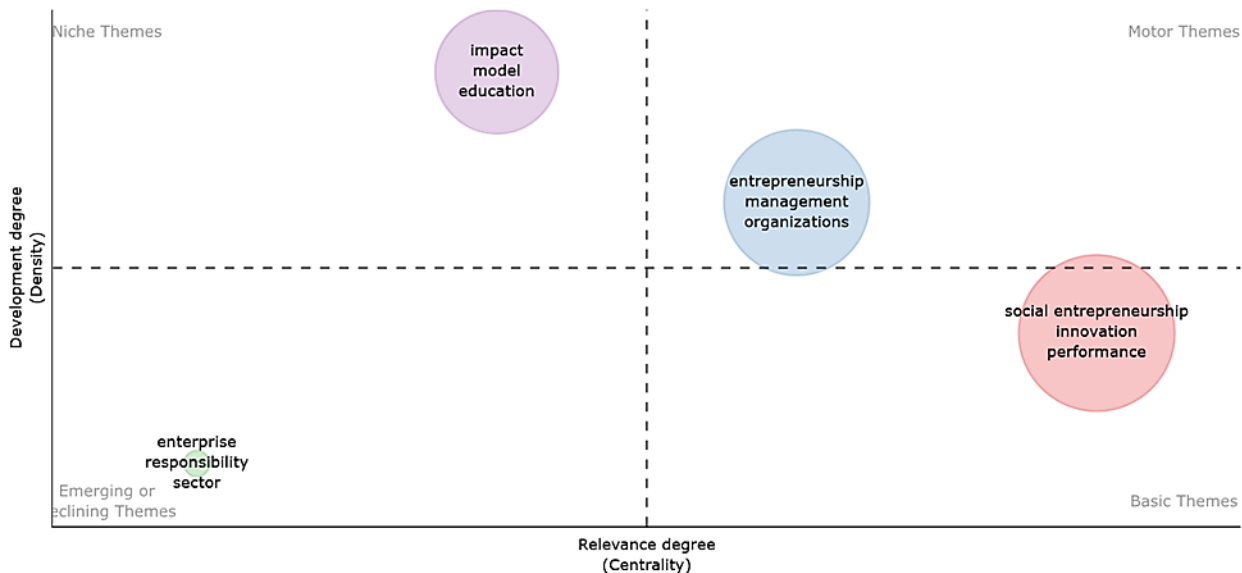


Figure 9: Strategic map of research in the field of SE in the WoS database (1990-2024)

Discussion

SE has garnered considerable attention, evidenced by the examination of 4292 articles on the WoS. Predominantly, these documents comprise journal articles, reflecting the scholarly discourse in this field. Moreover, analysis reveals the utilization of 20 languages, with English being the primary language of publication, followed by Spanish and Russian. A discernible trend indicates a significant growth in articles from 2015 to 2021, with a peak in 2024, reflecting heightened academic interest. Over the past two decades, SE research has transitioned from a nascent field to a well-established discipline. This evolution is evident in studies conducted by Khaseh and Habibi (2018), Amousa et al. (2023), and Persaud and Bayon (2019), which validate the findings.

Notably, the majority of publications in this field are found in journals such as Sustainability and the Journal of Social Entrepreneurship. These trends are supported by the findings of Khaseh and Habibi (2018). Additionally, a significant proportion of works originate from authors based in the United States, England, and Germany, consistent with the research of Khaseh and Habibi (2018), Cozma and Bucancia (2020), and Amousa et al. (2023). The findings reveal that SE encompasses a diverse range of thematic areas, with 133 related topics identified in the Web of Science (WoS) database. Notably, subtopics within Business and Management emerge as particularly prominent in the field of SE on the Web of Science (WoS). These results align with the study by Sassmannshausen and Volkmann (2018), which highlights the multidisciplinary nature of entrepreneurship research, spanning economics, management, ethics, sociology, entrepreneurship, and innovation, as noted by Persaud and Bayon (2019).

Key phrases such as "SE," "social enterprise," "entrepreneurship," "social innovation," "sustainability," and "innovation" emerge as the most frequent in SE literature on the WoS

database. These findings corroborate the importance of innovation and social value creation emphasized in the research of Khassa and Habibi (2018), and Persaud and Bayon (2019). Moreover, SE studies on a global scale in the WoS database are categorized into 6 clusters, with significant clusters including Entrepreneurship education, Legitimacy and impact of investment in entrepreneurship, The social mission of entrepreneurial organizations in the period of Covid-19, Social changes and the role of governance in entrepreneurship, and Innovation, development, entrepreneurship, and society. These findings are consistent with the research conducted by Amousa et al. (2023), highlighting the multifaceted nature of SE research and its global significance.

This research aimed to conduct a descriptive and productive analysis of scientific research in the field of SE using the Web of Science (WoS) database, employing the scientometric method of vocabulary co-occurrence analysis. The study focused on the community of researchers engaged in SE, comprising individuals affiliated with universities and academic centers, whose work was published between 1990 and 2024 and indexed in the Web of Science (WoS) database. While entrepreneurship typically pertains to the creation of production, value, and innovation, social entrepreneurship (SE) transcends these notions by integrating social and cultural values inherent to each society. SE has the unique ability to combine investments, economic considerations, social values, and cultural dimensions, thereby fostering an entrepreneurial social environment and offering numerous benefits.

The research findings reveal a diverse array of topics related to SE in WoS publications, indicating academic diversity and a focus on American universities and various countries. Theoretically, the identification and categorization of approximately six conceptual clusters encompass social innovation, influential entrepreneurship models, organizational sustainability and bricolage, gender, and education. The collection of articles sheds light on the multifaceted nature of SE research. Moreover, the results suggest a burgeoning interest in SE studies, with expectations of more focused research in this area in the future.

In addition to quantitative criteria and the publication record, it is apparent that advanced countries prioritize aligning economic, social, and cultural criteria within entrepreneurship. This alignment contributes to enhancing economic efficiency and social impact within these societies. Studies conducted by Rey-Martí, Ribeiro-Soriano, and Palacios-Marqués (2016) and Klarin and Suseno (2023) underscore the importance of aligning profitable economic goals with social criteria in SE studies. Findings showed that the first quadrant, which includes the topic of corporate entrepreneurship, has the highest levels of development and relevance in SE studies. The second quadrant depicts niche topics in this field, including impactful education. The third includes corporate responsibility. The fourth quadrant, representing fundamental topics, provides for the topic of social innovation. Entrepreneurs of the future must strive to merge the pursuit of profit with a sense of mission. Authentic leadership in the future will be defined by striking a balance and contributing to the global goal of prosperity and harmony.

Conclusion

The innovative aspect of SE research lies in its relevance to the increasing demands of today's modern world, which seeks to create links between the economy, society, and cultural contexts through an interdisciplinary approach. Research in the field of SE is interdisciplinary and extensive, drawing upon a wide range of disciplines and perspectives. This multidisciplinary approach enriches the understanding of SE and its impact on society. As the

field continues to evolve, it is essential to establish new study sections and areas of research that are explicitly dedicated to SE. By doing so, researchers can delve deeper into various aspects of SE, exploring emerging trends, innovative practices, and addressing pressing societal challenges. Moreover, the creation of newer study sections will foster collaboration among researchers from diverse backgrounds and disciplines, further advancing knowledge and facilitating the development of effective strategies and interventions in the realm of SE.

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