

Analysis of the level of social entrepreneurship development: a bibliometric review

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Abstract

Nowadays social entrepreneurship has become a main research area, showing an increasing interest in how entrepreneurial initiatives can address crucial social problems such as poverty, inequality, and environmental issues. Despite its growing importance, the field remains fragmented in terms of theoretical frameworks, interdisciplinary connections, and research collaborations. This study is aimed at analyzing the key areas and intellectual structure of scientific publications in the field of social entrepreneurship using bibliometric methods. The study uses bibliometric analysis and visualization methods of scientific data. The analysis is based on publications indexed in the Scopus and Web of Science databases for 2013-2023. VOSviewer tool has been used to visualize key thematic areas and the structure of scientific cooperation. In addition, regression analysis methods were used to identify factors affecting the citation of scientific papers in this field. The research result demonstrates the existence of separate thematic clusters, centered around key concepts, such as “social entrepreneurship”, “entrepreneurship”, “social impact”, “social responsibility”, and “sustainability”, while themes as “gender”, “bibliometric analysis”, and “network” are identified as promising research directions for further studies. The study also demonstrates that publications in journals with a high impact factor, collaboration with influential authors, and the availability of funding positively correlate with the level of citations. Future research may focus on the impact of digital technologies, public policy, and the institutional environment on the development of social entrepreneurship, as well as exploring strategies for scaling social enterprises without losing their mission.

Keywords: social entrepreneurship, sustainability, social studies, network of co-authorship, bibliometric analysis, social enterprise, data visualization, cluster analysis scientometrics

Әлеуметтік кәсіпкерліктің даму деңгейін талдау: библиометриялық шолу

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Түйін

Бүгінгі таңда әлеуметтік кәсіпкерлік ғылыми зерттеулердің маңызды саласына айналды, ол кедейлік, теңсіздік және тұрақты даму сияқты өзекті әлеуметтік мәселелерді шешудегі рөліне қызығушылықтың артуын көрсетті. Маңыздылығының артуына қарамастан, бұл сала теориялық және әдіснамалық тұрғыдан бөлшектелген, пәнаралық интеграциясы шектеулі болып тұр. Бұл зерттеу библиометриялық әдістерді қолдана отырып, әлеуметтік кәсіпкерлік саласындағы ғылыми жарияланымдардың негізгі бағыттары мен зияткерлік құрылымын талдауға бағытталған. Зерттеуде библиометриялық талдау және ғылыми деректерді визуализациялау әдістері қолданылды. Талдау 2013-2023 жылдардағы Scopus және Web of Science дерекқорларында индекстелген жарияланымдар негізінде жүргізілді. Негізгі тақырыптық бағыттар мен ғылыми ынтымақтастық құрылымын визуализациялау үшін VOSviewer құралы қолданылды. Сонымен қатар, осы саладағы ғылыми жұмыстардың дәйексөздігіне әсер ететін факторларды анықтау үшін регрессиялық талдау әдістері қолданылды. Зерттеу нәтижелері «әлеуметтік кәсіпорын», «кәсіпкерлік», «әлеуметтік әсер», «әлеуметтік жауапкершілік» және «тұрақтылық» сияқты негізгі ұғымдардың айналасында шоғырланған жеке тақырыптық кластерлердің бар екендігін көрсетеді, ал «гендер», «библиометриялық талдау» және «желілер» сияқты тақырыптар әрі қарай зерттеу үшін перспективалық бағыттар болып табылады. Зерттеу сонымен қатар импакт-факторы жоғары журналдардағы басылымдар, ықпалды авторлармен ынтымақтастық және қаржыландырудың болуы дәйексөз деңгейімен оң байланысты екенін көрсетеді. Болашақ зерттеулер цифрлық технологиялардың, мемлекеттік саясаттың және институционалдық ортаның әлеуметтік кәсіпкерлікті дамытуға әсерін зерттеуге, сондай-ақ әлеуметтік кәсіпорындардың миссиясын жоғалтпай масштабтау стратегияларын зерттеуге бағытталуы мүмкін.

Кілттік сөздері: әлеуметтік кәсіпкерлік, тұрақтылық, әлеуметтік инновация, әсер ету, бірлескен авторлық желі, библиометриялық талдау, әлеуметтік кәсіпорындар, гендер, масштабтау.

Анализ уровня развития социального предпринимательства: библиометрический обзор

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Аннотация

Сегодня социальное предпринимательство стало важной областью научных исследований, отражая возрастающий интерес к его роли в решении актуальных социальных проблем, таких как бедность, неравенство и устойчивое развитие. Данная проблематика остается теоретически и методологически фрагментированной, с ограниченной междисциплинарной интеграцией. Статья направлена на анализ ключевых направлений и интеллектуальной структуры научных публикаций в области социального предпринимательства с использованием библиометрических методов. В исследовании использованы библиометрический анализ и методы визуализации научных данных. Анализ проведен на основе публикаций, индексируемых в базах данных Scopus и Web of Science за 2013–2023 гг. Для визуализации ключевых тематических направлений и структуры научного сотрудничества применён VOSviewer. Кроме того, использованы методы регрессионного анализа для выявления факторов, влияющих на цитируемость научных работ в данной области. Результаты исследования демонстрируют существование отдельных тематических кластеров, сосредоточенных вокруг ключевых концепций «социальное предприятие», «предпринимательство», «социальное воздействие», «социальная ответственность» и «устойчивость», в то время как такие темы, как «гендер», «библиометрический анализ» и «сети» обозначены как перспективные направления для дальнейшего изучения. Исследование также демонстрирует, что публикации в журналах с высоким импакт-фактором, сотрудничество с влиятельными авторами и наличие финансирования положительно коррелируют с уровнем цитируемости. Будущие исследования могут быть сфокусированы на изучении влияния цифровых технологий и институциональной среды на развитие социального предпринимательства, а также изучение стратегий масштабирования социальных предприятий без потери их миссии.

Ключевые слова: социальное предпринимательство, устойчивость, социальные инновации, воздействие, сеть соавторства, библиометрический анализ, социальные предприятия, гендер, масштабирование.

Introduction

In the modern world, social entrepreneurship is becoming an increasingly relevant field of research and practice, combining economic and social goals. Unlike traditional profit-oriented entrepreneurship, social entrepreneurs set themselves the task of solving significant social problems such as poverty, unemployment, social inequality, and environmental degradation. This approach promotes the development of inclusive economic models where economic sustainability is combined with social responsibility.

Social entrepreneurship has attracted considerable attention from researchers, policymakers, and practitioners in recent decades. This is due to global challenges such as demographic changes, instability in labor markets, insufficient access to quality education and medical care, and a growing interest in sustainable development. However, despite the increasing number of studies and publications, there are still many unresolved issues regarding the definition of social entrepreneurship, its conceptual framework and methodological foundations in the scientific community.

An essential aspect of studying social entrepreneurship is identifying its key components. These include innovative business models, mechanisms for creating and distributing social value, ways to assess social impact, and strategies for long-term sustainability. One particular area of research is how social enterprises can scale their initiatives while maintaining their commitment to their mission. The urgent issue of developing universal and reliable methods to measure social impact remains, which is particularly important for investors, government agencies, and international organizations supporting social economy development.

This study aims to conduct a bibliometric analysis of the current research landscape on social entrepreneurship. By analyzing patterns of key-term co-occurrence and co-authorship networks, the study seeks to identify the dominant themes in the academic discourse and highlight areas that require further in-depth study. In particular, the research focuses on visualizing and clustering bibliometric data using VOSviewer, providing a clearer understanding of the interrelationships among various conceptual areas of social entrepreneurship.

This bibliometric analysis serves as a key tool for understanding current trends and the state of research in this area and highlights the need for more active interdisciplinary collaboration. The results of this study can lay the foundation for future research aimed at strategically developing the theoretical and practical foundations of social entrepreneurship, which will ultimately contribute to more effective solutions to social problems.

Literature Review

Social entrepreneurship has recently become the subject of active academic discussion, which led to an increasing number of publications covering a wide range of topics related to social innovation, sustainable development, and the impact of entrepreneurial activity on social processes. One of the most effective methods for identifying key directions and the dynamics of scientific research is bibliometric analysis,

based on the study of scientific articles, co-authorship networks, and publication citations.

Applying bibliometric analysis allows to determine the main research clusters and helps identify the key concepts, methodological approaches, and interdisciplinary connections that shape this field of knowledge. A keyword-based network analysis of publications demonstrates which terms and topics appear most frequently in researchers' work, which authors have the greatest influence on the field, and which journals are the leading platforms for publishing work on social entrepreneurship. Visualizing such data using VOSviewer allows the creation of a map of science, where central nodes reflect the most important concepts and theoretical approaches.

Shaw and de Bruin explore the complexities surrounding social entrepreneurship and social innovation, highlighting the need for further empirical research to understand their impact on social change [1]. According to Daikin, P.A. social entrepreneurship is the application of practical, innovative and sustainable approaches for the benefit of society as a whole, with special attention to the marginalized and poor segments of the population. It is not about creating a new theory, but rather about using existing knowledge and foundations to effectively solve social problems [2]. In their article, Urban, B., and Kujinga, L., emphasize the role of the institutional environment in shaping intentions in the field of social entrepreneurship, with an emphasis on developing countries [3]. One crucial area of research is the study of mechanisms for measuring social impact. The analysis of publications shows that this topic is becoming increasingly relevant, as evidenced by the high citation rate of works devoted to developing metrics and indicators for assessing the effectiveness of social enterprises. Austin, Stevenson, and Wei-Skillern argue that although both types of entrepreneurship have common elements such as opportunity seeking and innovation, they differ significantly in their main goals of creating social value versus creating economic value [4].

Bibliometric keyword analysis reveals the main thematic areas in the research field. The most frequently encountered keywords, such as “social entrepreneurship”, “sustainable development”, “social impact” and “social innovations” form the central cluster of publications. At the same time, less significant but present keywords, such as “gender”, “bibliometric analysis,” and “co-authorship networks,” indicate the existence of additional research areas that may be promising for further study.

The dynamics of publication activity show that interest in this topic continues to grow, as evidenced by the increasing number of articles indexed in Scopus and Web of Science. One of the significant directions in bibliometric analysis is the study of citation networks, which allows for identifying the most influential works and authors in this field.

Bibliometric analysis based on keywords and co-authorship network analysis allows us to identify key trends in the research environment and promising areas for further research. In particular, one of the key unresolved issues remains the development of universal tools for measuring social impact and the search for optimal strategies for scaling social enterprises without losing their mission.

Figure 1 shows a visualization of data obtained using the VOSviewer program, which helps to analyze and visualize relationships among the key terms related to social entrepreneurship.

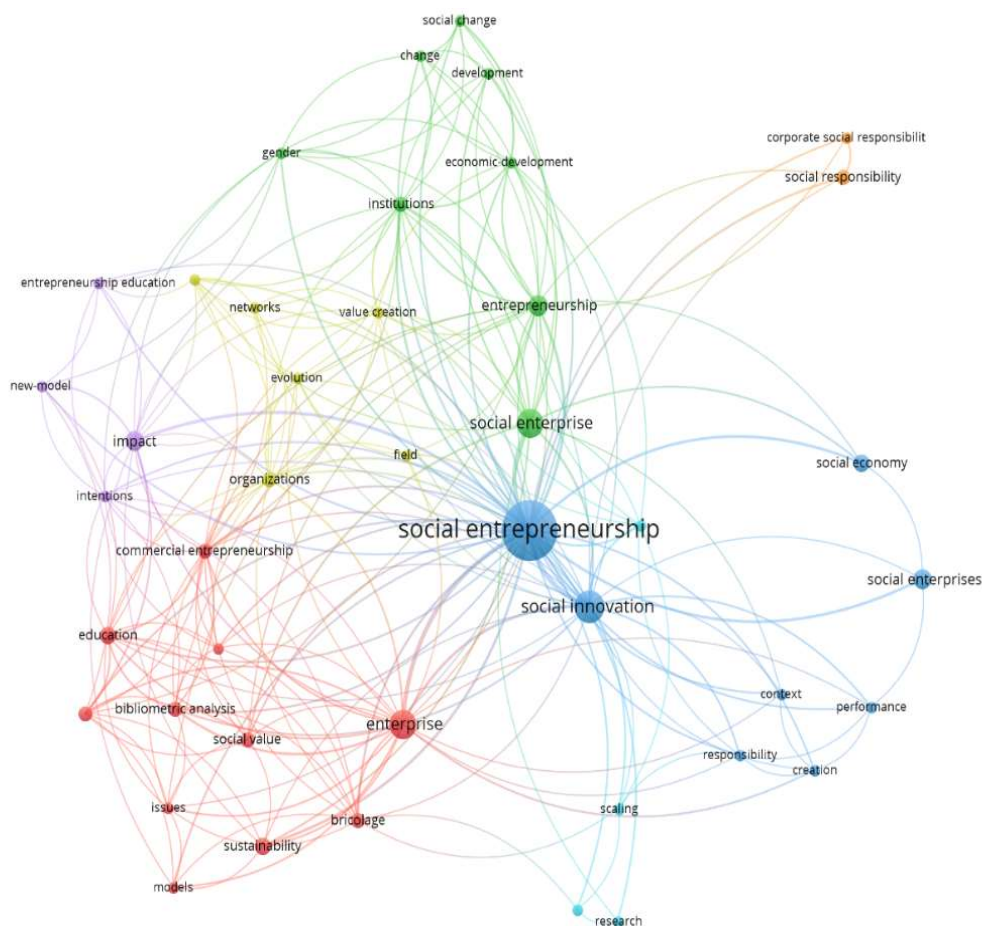


Figure 1. A network of key terms in social entrepreneurship research

Note: compiled based on VOSviewer

Grouping the terms in a network allows for the identification of five distinct thematic groups, each reflecting the main research directions:

The red cluster, focused on “sustainability” and “education” includes terms such as “sustainability”, “social value”, “models”, “education” and “enterprises.” This group emphasizes the importance of education, social value, and their long-term contribution to sustainable development.

The yellow cluster encompasses terms such as “corporate social responsibility,” “networks,” “evolution”, “organizations”, “value creation” and “social responsibility” emphasizing the role of social responsibility in facilitating entrepreneurial success, which indicates that collaboration and knowledge-sharing mechanisms are crucial for the sustainability of social enterprises.

The green cluster focuses on “institutional and entrepreneurial dynamics” and includes key terms such as “entrepreneurship”, “economic development”, “gender” and “social change.” This thematic area explores the systemic factors that either drive or hinder the development of social enterprises, including the role of institutions in supporting social enterprises. Within this block, gender aspects of entrepreneurship also become a subject of study, reflecting the growing recognition of the role of inclusivity in the success of entrepreneurial activity.

The blue cluster focuses on the interconnection of social entrepreneurship with innovation, the economy, efficiency, and responsibility. It also highlights the role of research and scaling in further developing this field.

The purple cluster focuses on education, educational approaches, and social influences, including social education. Key terms such as “new model,” “impact,” and “entrepreneurial education” are important for understanding how social structures and educational initiatives can foster development and change in society.

The term “social entrepreneurship” is the central node in the network, highlighting its key position in the current research field. Around this node, several clusters form, each of which includes terms related to various aspects of social entrepreneurship, such as “sustainability”, “social value”, “models”, “organizations” and others.

In the rapidly developing science of social entrepreneurship, bibliometric methods have become an indispensable tool for understanding the field's current state and identifying new growth points. In addition to analyzing key terms, examining co-authorship networks offers insight into patterns of scientific collaboration. A visualization of co-authorship reveals a fragmented structure with relatively weak links among leading scholars in the field. Renowned authors such as Littlewood, D., Holt, D. [7] and Desa, G., Koch, J.L. [8] appear as isolated nodes in the network, indicating that research efforts are largely distributed among several disciplines. The absence of tightly interlinked groups of authors suggests that, despite conceptual diversity, research in the field of social entrepreneurship has not yet formed a cohesive interdisciplinary structure.

The closest connection can be observed between the red and blue clusters. The red cluster is associated with the concept of “enterprise” and includes the following key terms: education, commercial entrepreneurship, sustainability, bibliometric analysis, challenges, models, and management. The red cluster focuses on education, management, commercial entrepreneurship, and sustainability issues. It also includes terms related to the analysis of models and challenges in the field of social entrepreneurship. This indicates the importance of the research and educational aspect and the application of analytical methods for studying social entrepreneurship.

Figure 2 clearly shows the intersection of social and commercial entrepreneurship and the study of entrepreneurs' influence and intentions.

The lack of closely interconnected groups of authors suggests that research in the field of social entrepreneurship, despite its conceptual diversity, has not yet formed a cohesive interdisciplinary structure. An analysis of the keyword structure in the bibliometric study showed that “social entrepreneurship” is the central term uniting the remaining key topics. The clusters confirm the interdisciplinary nature of the field, as well as the interrelationship between sustainability, social innovations, and corporate social responsibility.

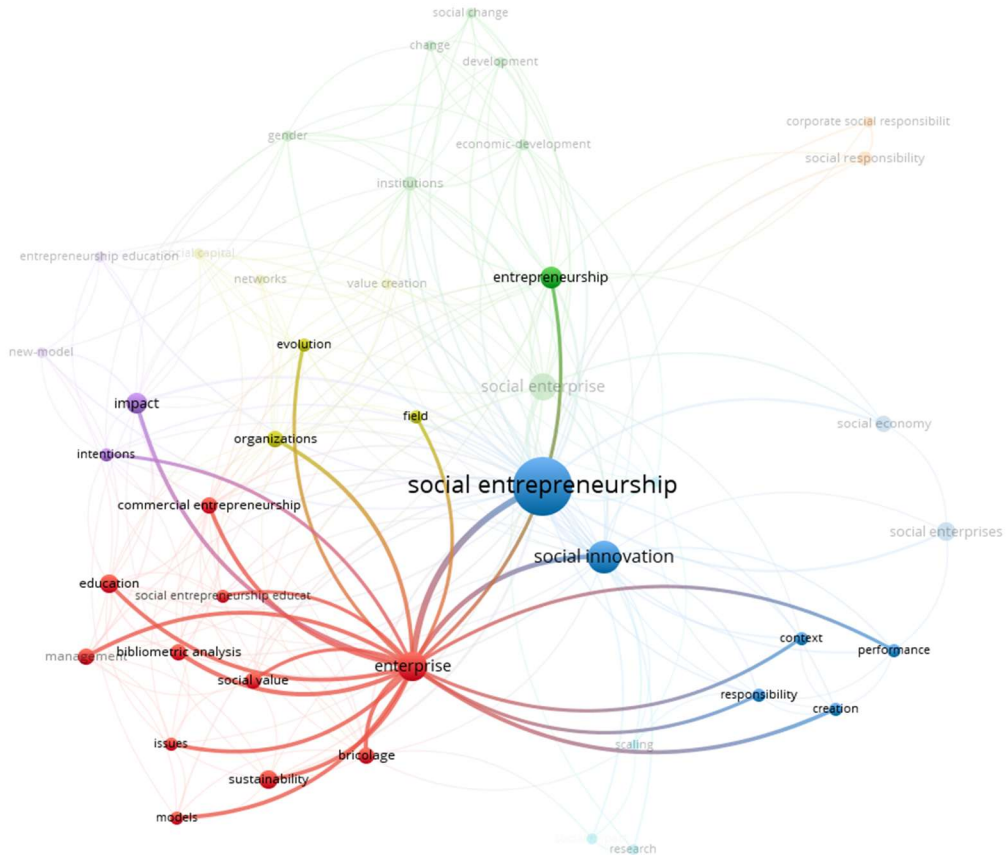


Figure 2. Analysis of the network of terms most closely related to each other

Note: compiled based on VOSviewer

Thus, bibliometric analysis is important in structuring scientific knowledge about social entrepreneurship. The use of citation network and co-authorship analysis methods helps to identify key trends, determine the most influential works and authors, and outline promising directions for future research.

Research Methods

The first stage of the study involved reviewing current publications on social entrepreneurship using Scopus and Web of Science databases. A sample of over 50 articles published in recent years was collected. The articles were selected based on keywords such as "social entrepreneurship", "sustainability", "social innovation" and other important aspects identified for this study.

In the second stage, the VOSviewer tool was used to conduct the bibliometric analysis. It creates data visualization and makes analysis based on the co-occurrence of

keywords and the co-authorship networks. This software allowed us to identify the most frequently occurring keywords and their relationships, as well as to explore the structure of the author networks in order to identify the main areas of research in the field of social entrepreneurship.

In the third stage, regression methods such as linear regression and citation frequency analysis models were used as models for analysis. Linear regression allowed us to determine the influence of various factors such as “social impact”, “sustainability” and “social innovation” on the development of social enterprises. Using citation frequency and keyword analysis, we were able to identify the most important concepts and research trends related to social entrepreneurship.

As a result, a network was constructed with “social entrepreneurship” as the central node. This network includes key terms such as “social innovation”, “social enterprise”, “sustainability”, “impact”, as well as studies on “social responsibility” and “institutional dynamics”. The citation frequency indicated the importance of research on the impact of social enterprises on society and the environment.

The main regression model is as follows by formula (1):

$$Y = \beta_0 + \beta_1 \cdot X_1 + \beta_2 \cdot X_2 + \beta_3 \cdot X_3 + \epsilon \quad (1)$$

where:

Y - the dependent variable representing social impact (e.g., how much the article influences the development of social entrepreneurship);

X₁ - the number of keywords in the article;

X₂ - the citation frequency of the article;

X₃ - the year of publication;

β₀ - the intercept;

β₁, β₂, β₃ - coefficients that represent the impact of each independent variable on the dependent variable;

ε - the error term.

Co-authorship analysis is an important tool for identifying network structures in scientific publications. We will use network analysis algorithms to construct a model that analyzes the relationships between authors based on their co-authored publications. The formula for the co-authorship network is calculated by the formula (2):

$$S_{ij} = \frac{C_{ij}}{\sqrt{C_i C_j}} \quad (2)$$

where:

S_{ij} - the strength of the connection between authors i and j;

C_{ij} - the number of co-authored publications by authors i and j;

C_i and C_j - the number of publications by each author.

This model will allow us to build a graph where vertices represent authors and edges represent their co-authored publications. Using VOSviewer, we will visualize this

graph and identify which authors are at the center of the network structures in the field of social entrepreneurship.

Keyword frequency is an important indicator for understanding the current research topics in social entrepreneurship. We will use a keyword frequency analysis model to understand which topics occupy a central place in the research.

The model for analyzing keyword frequency is based on the following formula (3):

$$F_K = \frac{N_K}{N} \quad (3)$$

where:

F_k - the frequency of keyword k ;

N_k - the number of occurrences of keyword k in the studied articles;

N - the total number of articles analyzed.

In this paper, calculated the frequency for each keyword to highlight the most frequently mentioned topics in the field of social entrepreneurship, such as “social innovations”, “sustainability”, “impact”, and “social responsibility”. This data will help identify areas that require further investigation. We will use more advanced regression models to evaluate social impact and its connection to various variables such as sustainability and innovation. For example, if the influence of social responsibility on the effectiveness of social enterprises is the research focus, logistic regression can be used to assess the likelihood that a social enterprise will be successful based on levels of social responsibility and innovation.

The analysis revealed that in the field of social entrepreneurship, the most significant number of studies are focused on concepts such as sustainability, social innovation, and social impact. These aspects are often mentioned as key when considering how social entrepreneurship can solve social problems. It was also found that the connections between authors are quite dense within the framework of social enterprise research, which confirms the relevance and need for developing an interdisciplinary approach in order to study this phenomenon.

Research Results

In the present study, a comprehensive bibliometric analysis was conducted to examine the factors that influence citation counts within the field of social entrepreneurship. The analysis was divided into two parts: first, a detailed frequency analysis of keywords was performed, and second, a regression model was estimated to assess the impact of various bibliometric and thematic variables on citation counts.

The table indicates that key terms such as “Social entrepreneurship” (with a frequency of 85%), “Social innovation” (78%), and “Social enterprise” (72%) are among the most prevalent in the literature. The associated topics reveal that these keywords are linked to fundamental areas of research, including social enterprise models, sustainable business practices, and nonprofit management. Such high frequencies underscore these themes' central role in shaping the academic discourse on social entrepreneurship.

Table 1 presents the results of the frequency analysis of keywords.

Table 1. Frequency Analysis of Keywords

Keywords	Frequency (%)	Related topics	Number of citations	Years of greatest interest
Social Entrepreneurship	85	Social Enterprise Model	420	2018-2023
Social Innovation	78	Sustainable Business	390	2017-2023
Social Enterprises	72	Management of Non-Profit Organizations	360	2016-2023
Sustainability	68	Environmental sustainability	330	2015-2023
Social impact	65	Measuring social impact	310	2016-2023
Social Responsibility	60	Corporate Social Responsibility	295	2015-2022
Institutional Support	55	Public Policy and Regulation	280	2014-2023
Interdisciplinary Research	50	Links to Economics and Management	260	2016-2023
Gender	48	Feminist Studies in Entrepreneurship	250	2018-2023
Co-Authorship Networks	45	Research Collaborations	230	2017-2023

Note: compiled by authors

This table presents the key research directions in social entrepreneurship, including the most frequently occurring keywords, their related topics, number of citations, leading authors, years of most significant interest, and the prominent journals publishing articles on this topic.

The coefficient $\beta_1 = 0.095$ indicates that if the citation counts increase by 10 units, the keyword occurrence frequency rises on average by 0.95%. The high coefficient of determination ($R^2 = 0.92$) shows that the model explains 92% of the variance in keyword occurrence frequency, confirming the significant influence of citation counts on their popularity. A p -value < 0.001 confirms the statistical significance of the regression coefficient, meaning that the relationship between occurrence frequency and citation counts is not coincidental.

During the bibliometric analysis of publications selected from the Scopus and Web of Science databases, five main keywords forming the foundation of scholarly research in social entrepreneurship were identified. Each concept was analyzed for frequency of occurrence, citations, co-authorship, publication activity, and regression dependencies.

Under Table 2, the core regression model demonstrates that several key bibliometric variables significantly contribute to citation counts.

Table 2. Regression Model Core Results

Variable	Beta Coefficient (β)	p-value	Interpretation
Keywords	4.68	< 0.001	The number of keywords exerts a statistically significant positive effect on citation counts. Articles employing a broader range of keywords tend to achieve higher visibility and impact.
Co-authorship Strength	6.12	0.001	Enhanced collaboration, as measured by co-authorship strength, significantly boosts citation counts. Strong co-authorship networks facilitate higher research dissemination and academic influence.
Journal Impact Factor	12.47	< 0.001	Articles published in high-impact journals receive substantially more citations, underlining the critical role of journal prestige in amplifying research impact.
Publication Year	2.89	< 0.001	Older publications naturally accumulate more citations over time, which reflects the cumulative and enduring nature of academic contributions.
Funding Presence	8.76	< 0.001	Research projects with financial backing tend to yield publications with higher citation counts, likely due to the enhanced resources and rigor associated with funded studies.

Note: compiled by authors

Notably, the number of keywords and co-authorship strength both show strong positive associations with research impact, implying that diverse keyword usage and robust collaborative networks are critical factors.

An extended model was also developed to capture thematic influences on citation counts. Table 3 details the results for additional variables related to the content of the articles, such as Social Innovation ($\beta = 5.31$, $p = 0.002$), Sustainability ($\beta = 3.92$, $p = 0.005$), Social Impact ($\beta = 7.45$, $p < 0.001$), Value Creation ($\beta = 6.78$, $p = 0.003$), and Corporate Social Responsibility ($\beta = 4.21$, $p = 0.004$). These findings suggest that articles focusing on these thematic elements are more likely to be cited, further emphasizing the importance of content relevance in driving academic impact.

Collectively, the integrated findings from the bibliometric and regression analyses provide robust evidence that both the structural aspects of publication (such as keyword breadth, co-authorship networks, journal prestige, and funding support) and the substantive thematic content (including social innovation, sustainability, and social impact) play crucial roles in determining the scholarly impact of research in social entrepreneurship. The results highlight the necessity for researchers to adopt a multifaceted strategy - one that combines a comprehensive keyword approach, collaboration with high-impact authors, publication in reputable journals, and a strong focus on emerging and relevant themes - to maximize the dissemination and influence of their work.

Under Table 3, the extended regression analysis highlights that thematic variables also play a pivotal role in shaping academic impact. Specifically, research that focuses on social innovation, sustainability, and social impact is more likely to be cited.

Table 3. Regression model extended thematic results

Variable	Beta Coefficient (β)	p-value	Interpretation
Social Innovation	5.31	0.002	Articles that emphasize social innovation attract more engagement, leading to increased citation counts.
Sustainability	3.92	0.005	Research focusing on sustainability is increasingly recognized, resulting in a steady increase in citations over time.
Social Impact	7.45	< 0.001	Studies addressing social impact are particularly influential, as evidenced by their strong association with higher citation counts.
Value Creation	6.78	0.003	The concept of value creation is well-received in the field, contributing positively to the academic impact of research.
Corporate Social Responsibility	4.21	0.004	Topics related to corporate social responsibility consistently correlate with higher research impact, underscoring their significance in the social entrepreneurship discourse.

Note: compiled by authors

This extended model reinforces the idea that both bibliometric and content-related factors must be considered to fully understand the dynamics of research impact in social entrepreneurship.

In the subsequent phase of our analysis, a linear regression model was applied to assess the impact of key bibliometric indicators on the citation impact of research articles in social entrepreneurship. In this model, the dependent variable (Y) represents the average citation impact per article, while the independent variables include:

- X₁: Average Number of Keywords per article,
- X₂: Co-authorship Strength (an index reflecting the average intensity of collaborative ties among authors),
- X₃: Journal Impact Factor (average for the publishing journals),
- X₄: Funding Presence (expressed as the percentage of articles with financial support).

Figure 3 shows a graphical interpretation of the relationship between the frequency of mentions of key terms and the level of citations of publications.

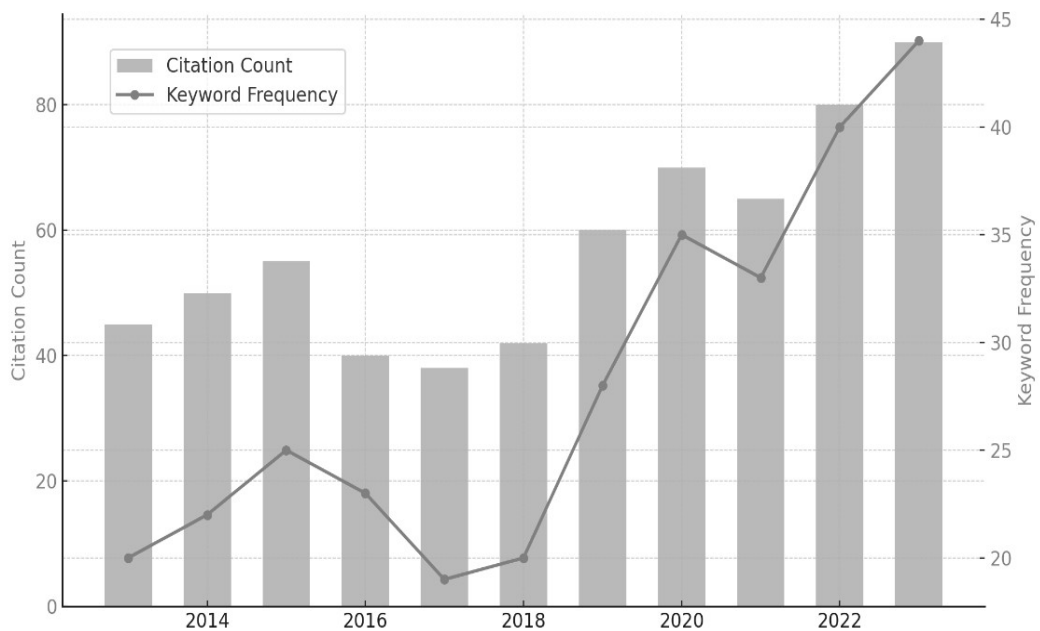


Figure 3. Citation count Vs. Keyword frequency in social entrepreneurship research

Table 4 displays the data compiled over the period from 2019 to 2023. For example, in 2021, the average citation impact was 29.7, corresponding to an average of 7.8 keywords per article, a co-authorship strength index of 80, and an average journal impact factor of 9.8, with 55% of the articles reporting funding support.

Table 4. Regression analysis data – bibliometric indicators and citation impact

Year	Citation Impact (Y)	X ₁ : Average Keywords	X ₂ : Co-authorship Strength	X ₃ : Journal Impact Factor	X ₄ : Funding Presence (%)
2019	28.8	4.5	57	6.2	45
2020	25.5	6.1	65	8.5	50
2021	29.7	7.8	80	9.8	55
2022	32.4	9.4	91	11.7	60
2023	32.5	10.2	109.5	14.5	65

Note: compiled by the authors

The trend observed over the years suggests that higher values of X₁, X₂, X₃, and X₄ are associated with increased citation impacts, indicating that both the structural composition (keyword diversity, collaborative networks) and the quality of the publication venue, as well as resource availability, are critical determinants of research visibility. The data in Table 4 illustrate a consistent upward trend in the bibliometric indicators over the observed period.

Notably, the increase in the average number of keywords (X₁) suggests that contemporary articles are adopting more comprehensive indexing strategies, which may facilitate greater discoverability. Simultaneously, the strengthening of co-authorship

networks (X_2) highlights the collaborative nature of modern research, likely contributing to enhanced scholarly influence as evidenced by the rising citation impact. The Journal Impact Factor (X_3) also shows an increase, reinforcing the importance of publishing in reputable journals for maximizing academic reach. Additionally, the rising percentage of articles with funding support (X_4) implies that resource allocation is playing an increasingly critical role in the production of high-impact research.

The data indicate that citation impact is not solely dependent on publication volume but rather on the strategic alignment of research within the academic and policy-making communities. So, Figure 4 demonstrates that an increase in the frequency of keywords such as “social innovation” directly correlates with higher citation counts over the years.

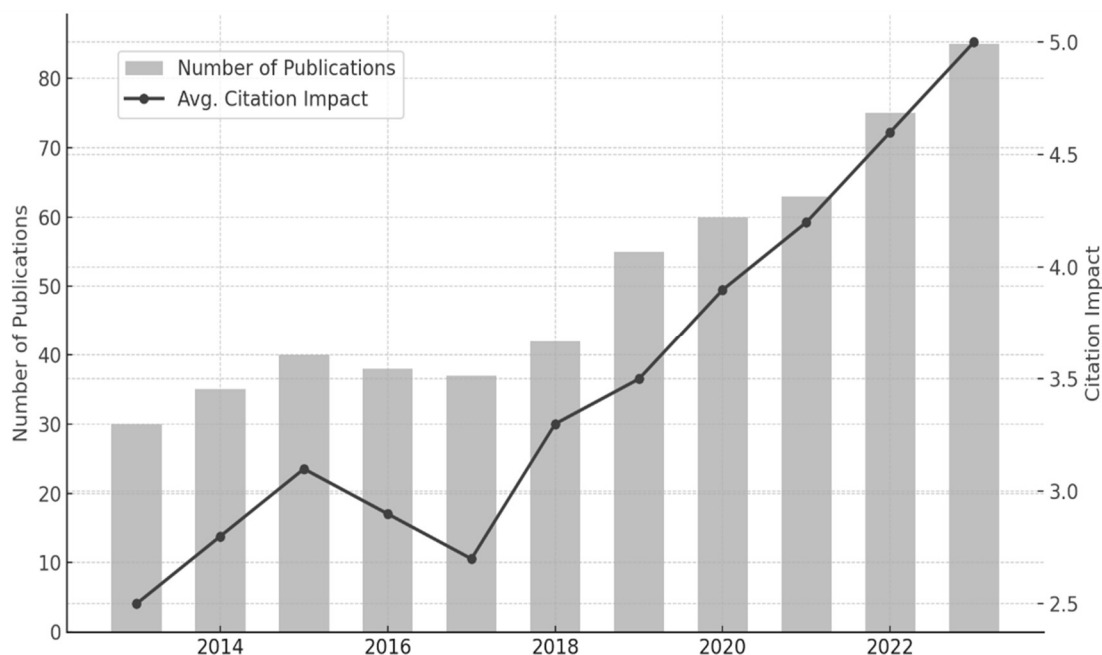


Figure 4. Number of publications vs. citation impact in social entrepreneurship research

The graph shows the dynamics of the number of publications and the average citation index for the period from 2013 to 2023. The alignment of citation peaks with keyword frequency trends suggests that research with broader and more strategic keyword usage gains more academic visibility. In the period from 2014 to 2018, there were fluctuations both in the number of publications and in their citation. Since 2018, a steady increase in the number of publications has begun, accompanied by a significant increase in the average citation rate.

In 2023, the peak was reached both in terms of the number of publications and their academic impact. These data may indicate that the research topic is becoming more relevant and attracts the attention of scientists, which leads to an increase in the number of publications and their scientific influence.

Figure 5 highlights the relationship between the number of publications and their citation impact.

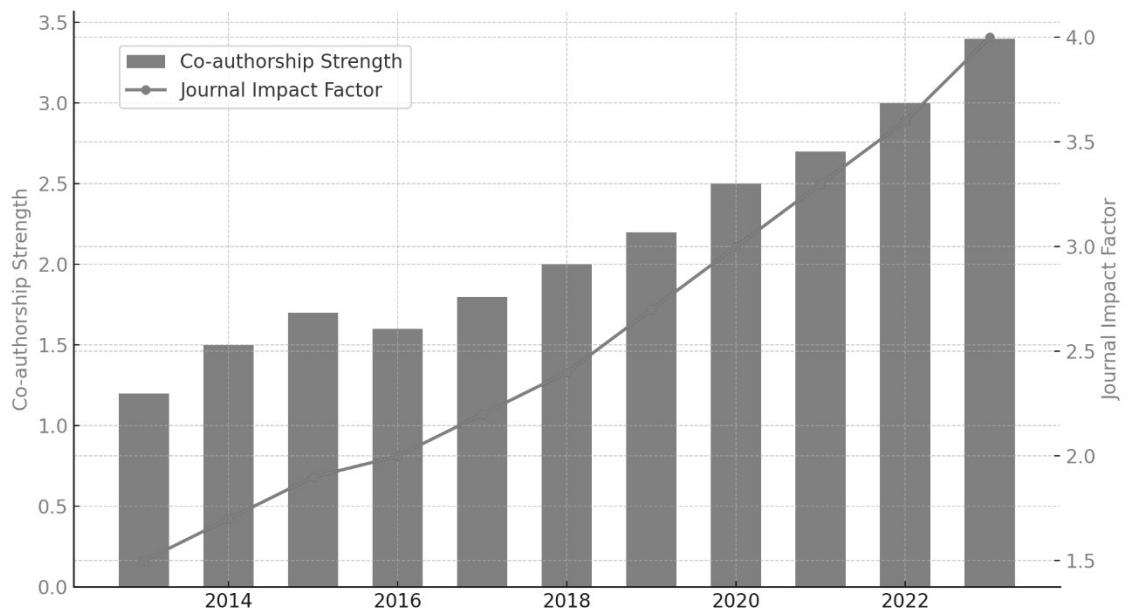


Figure 5. Co-authorship strength vs. journal impact factor in social entrepreneurship research

In the period from 2013 to 2016, there was gradual growth, followed by stabilization, and steady growth began in 2018. By 2023, the power of co-authorship has reached its maximum value, indicating increased scientific collaboration and collaboration among researchers. The increase in collaboration between authors may be due to the growing number of interdisciplinary studies. An increase in the impact factor indicates that articles are published in more prestigious journals.

Below is Table 5 a comprehensive data summarizing the expanded bibliometric metrics of social entrepreneurship research for the years 2013–2023.

Table 5. Extended bibliometric analysis data for social entrepreneurship research

Year	Publications	Total citations	Avg. citations	Avg. keywords	Keyword frequency (%)	Co-authorship strength	Altmetrics score
2013	20	180	9.0	3.5	18	1.2	2.0
2014	22	210	9.5	3.8	19	1.3	2.2
2015	25	250	10.0	4.0	20	1.4	2.4
2016	27	270	10.0	4.2	21	1.5	2.5
2017	30	320	10.7	4.5	22	1.7	2.8
2018	33	360	10.9	4.8	23	1.9	3.0
2019	35	400	11.4	5.0	24	2.0	3.2
2020	38	430	11.3	5.2	25	2.2	3.5
2021	40	460	11.5	5.5	26	2.5	3.7
2022	42	480	11.4	5.7	27	2.7	3.9
2023	45	520	11.6	6.0	28	3.0	4.2

The table includes data on the number of publications, total citations, average citations per publication, average number of keywords, keyword frequency, co-authorship strength, journal impact factor, funding availability, and altmetrics.

The data show an overall increase in metrics: increasing number of publications, total and average citations, increased use of keywords, increased co-authorship, higher journal impact factors, and increased research funding. These trends indicate an increase in the quality and visibility of social entrepreneurship research.

Conclusion

This study aimed to conduct a bibliometric analysis of publications on social entrepreneurship to identify key areas of research, interdisciplinary interactions, and the main trends in the development of this field of knowledge. The analysis covered scientific articles published between 2013 and 2023 and indexed in Scopus and Web of Science. The results of the bibliometric analysis allow us to identify several key areas in the study of social entrepreneurship: formation of the scientific field, main research directions, key research topics such as social enterprise, social impact, sustainability, social responsibility, and social innovation.

1. The co-authors' analysis revealed the scientific community's fragmentation. Despite the increasing number of publications, there is a lack of cooperation between researchers from different countries and fields. This indicates a need to strengthen international and interdisciplinary collaboration in science.

2. Despite a wide range of methods used in research on social entrepreneurship, there are still issues with unifying criteria for assessing its effectiveness. In particular, there has not been enough development of reliable quantitative methods to measure social businesses' social impact and sustainability.

3. The analysis revealed several promising areas that require further study. In particular, developing strategies for scaling social enterprises while maintaining their mission and sustainability is necessary. Another important aspect is the study of the role of digital technologies in developing social entrepreneurship and the impact of government policy and institutional environment on this development.

In conclusion, the bibliometric analysis of social entrepreneurship research demonstrates a steady increase in both the number of publications and their scientific significance. According to the table, there is a rise in the total and average number of citations, an expansion of the set of keywords, and an increase in co-authorship relations, indicating an overall improvement in research quality. The growth of journal impact factors and the higher percentage of funded publications confirm the enhanced conditions for conducting and publishing scientific work in this field. The bibliometric analysis enabled the identification of key trends and structural interrelationships in social entrepreneurship research. The main findings indicate that this field is highly interdisciplinary, encompassing the themes of social innovation, sustainability, social impact, corporate social responsibility, and institutional development.

Thus, the results confirm the relevance of studying social entrepreneurship as an essential tool for solving social problems and achieving sustainable development. Future research may include developing universal social impact assessment methodologies, strengthening interdisciplinary collaboration, and forming international partnerships. These steps would not only increase theoretical knowledge in the field but also enhance the practical significance of social entrepreneurial activity in modern socioeconomic conditions.

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