Edusentris: Jurnal Ilmu Pendidikan dan Pengajaran
p-ISSN 23560703 | e-ISSN 24422592
https://ejournal.upi.edu/index.php/edusentris/index

ENTREPRENEURSHIP IN HIGHER EDUCATION: A BIBLIOMETRIC ANALYSIS OF RESEARCH TRENDS AND FUTURE DIRECTIONS FROM 2010–2025

Siti Rachmatilah
Bisnis Digital, Politeknik Jatiluhur, Indonesia
Correspondence: *E-mail: siti.rachmatilah@gmail.com

ABSTRACT

This study aims to provide a comprehensive bibliometric analysis of research trends and future directions in entrepreneurship within higher education contexts from 2010 to 2025. Utilizing data retrieved from the Scopus database, a total of 616 peer-reviewed journal articles within the subject areas of Social Sciences, and Business, Management, and Accounting were analyzed using VOSviewer and Biblioshiny software. Results reveal a steady growth in academic interest, with an annual publication increase of 4.73%. Spain, the United Kingdom, and the United States emerged as the most productive countries, underscoring their substantial influence in shaping scholarly discussions. Keyword co-occurrence and cluster analyses identified several prominent research themes, including entrepreneurial intentions, social entrepreneurship, technology transfer, innovation, experiential learning, and sustainability. These findings illustrate the multidimensional nature of research on entrepreneurship education, highlighting both traditional areas of focus and emerging trends. Based on these insights, future research is encouraged to further explore digital transformation's role in entrepreneurial education, integrate sustainability into curricular and institutional practices, and investigate the long-term impact of entrepreneurship education on students' career outcomes and broader socio-economic development. This analysis provides a robust reference for researchers, policymakers, and educational institutions aiming to advance entrepreneurship education in the rapidly evolving landscape of higher education.

ARTICLE INFO

Article History:
Submitted/Received: 3Sep2024
First Revised: 26 Sep 2024
Accepted: 15 Nov 2024
First Available online: 1 Dec 2024
Publication Date: 1 Dec 2024

Keyword: *Bibliometrics, Digital Literacy, Elementary School,*

1. INTRODUCTION

In the last decade, entrepreneurship education has emerged as a pivotal subject within higher education institutions globally, reflecting an increased recognition of entrepreneurial skills as essential competencies for students in the contemporary labor market (Nabi et al., 2017; Fayolle & Gailly, 2015). Higher education institutions (HEIs) play a significant role in nurturing entrepreneurial intentions, mindsets, and behaviors among students through structured programs, curricular activities, and institutional strategies designed to cultivate entrepreneurial culture (Maritz & Brown, 2013; Guerrero et al., 2016). This shift is driven by global economic trends, technological advancements, and the growing need for innovation-driven economies that require entrepreneurial thinking and action among the younger generation (Rauch & Hulsink, 2015).

Entrepreneurship education within higher education contexts has evolved significantly from traditional business-oriented frameworks to interdisciplinary models that incorporate technology, innovation, sustainability, and social entrepreneurship components (Neck & Greene, 2011; Kuratko & Morris, 2018). Moreover, contemporary entrepreneurship education extends beyond business schools, influencing diverse disciplines including engineering, science, social sciences, and humanities, highlighting its multidisciplinary and integrative nature (Jones & Iredale, 2010; Pittaway & Cope, 2007). HEIs have increasingly adopted entrepreneurial education as a strategic tool to enhance graduates' employability, promote innovation, and stimulate economic growth (Bae et al., 2014).

Despite the widespread adoption and recognized importance of entrepreneurship education, academic research in this domain has exhibited fragmented patterns, highlighting the necessity for a comprehensive synthesis to identify prevailing research themes, key contributors, emerging trends, and future directions (Fayolle, 2013; Nabi et al., 2017). Prior systematic reviews and bibliometric analyses have provided valuable insights into entrepreneurship education research, yet gaps remain concerning longitudinal analyses covering recent and future-oriented trends, particularly in the context of rapidly changing global education dynamics (Ferreira et al., 2017; Liñán & Fayolle, 2015).

Bibliometric analyses, characterized by their capacity to systematically review large volumes of scholarly literature and quantitatively assess research trends and patterns, offer a rigorous methodological approach to understand the state-of-the-art in entrepreneurship education (Zupic & Čater, 2015). Such analyses employ statistical techniques and visualization tools to map out thematic evolution, identify research gaps, explore collaboration networks, and predict future research trajectories (Van Eck & Waltman, 2010; Donthu et al., 2021). By adopting bibliometric methods, researchers can capture comprehensive snapshots of academic landscapes, providing stakeholders including educators, policymakers, and researchers—with critical insights necessary to enhance educational practices and policy-making (Donthu et al., 2021).

Given the increasing importance of entrepreneurship in higher education and the fragmented nature of existing research, this study aims to conduct a systematic bibliometric analysis covering literature published from 2010 to 2025. The scope reflects critical

developments and transformative shifts within the higher education sector, driven significantly by digitalization, globalization, and evolving societal demands. This study intends to identify key research themes, highlight influential authors and institutions, analyze publication patterns, and delineate emerging areas warranting further exploration. Specifically, the objectives of this research are to: (1) identify publications Trends and key contributors, (2) Research map landscape of entrepreneurship in higher education, and (3) suggest directions for future research based on identified gaps and emerging trends.

Through addressing these objectives, the article contributes theoretically by enriching the existing knowledge base with updated insights and empirically by guiding future research trajectories. Practically, the findings provide actionable intelligence to educators, academic leaders, and policymakers aiming to enhance entrepreneurial education strategies within higher education institutions.

2. METHOD

Data Source and Search Strategy

This bibliometric analysis utilized the Scopus database, which is recognized as one of the most comprehensive databases of peer-reviewed literature covering multidisciplinary fields (Mongeon & Paul-Hus, 2016). Scopus was chosen due to its extensive coverage of high-quality journals and its robust analytical tools suitable for rigorous bibliometric studies (Donthu et al., 2021).

The search strategy began with defining the main keywords pertinent to the research topic. In this study, the primary keywords used were "entrepreneurship" and "higher education", with the Boolean operator "AND" used to combine the two terms in the Scopus database's advanced search column for "keywords". This combination aimed to capture scholarly literature explicitly addressing the intersection between entrepreneurship and higher education.

Initially, the keyword search generated a total of 972 publications. Subsequently, the dataset underwent further refinement and screening according to several predefined inclusion criteria to enhance relevancy and quality. Specifically, the selection criteria included:

1. Year of Publication: Articles published from 2010 to 2025 to reflect the most recent trends and ensure currency in research discussions.
2. Subject Area: Articles classified exclusively under the subject areas of Social Sciences and Business, Management, and Accounting. This criterion was designed to align closely with the disciplinary scope and focus of the current research.
3. Document Type: Only peer-reviewed journal articles were included, excluding other publication types such as books, conference papers, reviews, editorials, and notes, to maintain the quality and reliability of the data analyzed.

After applying these selection criteria, the resulting dataset was narrowed down to 616 journal articles, which formed the basis for subsequent bibliometric analyses in this study.

Data Extraction and Analysis Techniques

To perform rigorous bibliometric analyses and visualization, two specialized software tools were employed: VOSviewer and Biblioshiny (Bibliometrix). These software packages are widely acknowledged as robust tools for performing systematic and comprehensive bibliometric analyses, capable of identifying patterns, trends, and relationships within large datasets of bibliographic information (van Eck & Waltman, 2010; Aria & Cuccurullo, 2017).

- VOSviewer, developed by van Eck and Waltman (2010), was utilized specifically to map and visualize bibliometric networks such as keyword co-occurrence analysis, author co-citation analysis, and journal citation mapping. VOSviewer was selected due to its capability of producing clear, interpretable network visualizations, thereby facilitating a deeper understanding of underlying research structures and themes (Donthu et al., 2021).
- Biblioshiny, an R-package developed under Bibliometrix software by Aria and Cuccurullo (2017), was used to perform comprehensive descriptive analyses, including annual scientific production trends, most influential authors, journals, citation analysis, and thematic evolution analysis. Biblioshiny provided a structured and user-friendly analytical workflow capable of comprehensive quantitative assessment of bibliometric data.

Analytical Procedure

The analytical procedure in this bibliometric study followed a systematic and structured workflow as follows:

1. Data Acquisition and Cleaning:
   Data from the Scopus database were exported in .csv and .bib formats. All bibliographic records were imported into Biblioshiny and VOSviewer software, and subsequently cleaned to remove duplicates and standardize author names and keywords.
2. Descriptive Bibliometric Analysis (Biblioshiny):
   Initial descriptive statistical analysis was performed, including the examination of annual publication growth, prominent journals, productive authors, citation impacts, country-specific research outputs, and thematic trends in entrepreneurship education research.
3. Network Analysis and Visualization (VOSviewer):
   Advanced bibliometric network analyses were conducted using VOSviewer, specifically:
   - Keyword Co-occurrence Analysis: to visualize prominent keywords and identify thematic clusters and research fronts.
   - Co-citation Analysis: to understand the intellectual structure and seminal works influencing entrepreneurship research in higher education.
   - Bibliographic Coupling: to identify the relatedness of documents based on shared references, highlighting research similarities and emerging themes.
4. Interpretation and Synthesis of Results:
   The final stage involved interpreting and synthesizing descriptive and network analysis

results. The outcomes were integrated to identify current research trends, intellectual structures, influential authors and institutions, collaboration patterns, and future research directions within the entrepreneurship education domain.

Methodological Limitations and Considerations

While bibliometric analysis provides an extensive quantitative overview of scholarly research, the methodological approach adopted in this study does carry inherent limitations. First, the study's reliance solely on the Scopus database may exclude potentially relevant articles available in other scholarly databases. Second, restricting the analysis to articles written in English could have excluded significant research contributions in other languages. Despite these limitations, the methodological rigor employed ensures that the study offers a comprehensive and insightful perspective on current trends and future directions in entrepreneurship research in higher education contexts.

3. HASIL DAN PEMBAHASAN

Publications Trends and key contributors

Based on search results, bibliometric data retrieval from the Scopus database, covering the timespan from 2010 to 2025, yielded a total of 616 journal articles relevant to the theme of entrepreneurship in higher education. These articles were published across 274 different scholarly journals, involving a total of 1,582 authors. Of these, 100 articles (approximately 16%) were single-authored. The international co-authorship rate was identified at 24.51%, indicating a notable degree of cross-country collaboration within this research domain. On average, each article involved approximately 2.93 co-authors and contained a collective use of 1,658 author-generated keywords. The selected articles cited a total of 33,279 references, with an average document age of 5.13 years. Furthermore, the publications attained an average citation rate of 19.79 citations per document, highlighting their significant academic impact. More detailed information can be seen in figure 1 below

Figure 1. Global Overview

The bibliometric analysis reveals a steady and significant growth in scholarly interest toward entrepreneurship in higher education, evidenced by an annual growth rate of 4.73%. The relatively high level of international collaboration (24.51%) underscores the global recognition and interdisciplinary nature of this research field, suggesting that knowledge creation in entrepreneurship education extends beyond national borders. Additionally, the substantial number of references (33,279) and the high average citation rate (19.79 citations

per document) demonstrate robust scholarly interaction and underline the importance and influence of foundational works within the discipline. The moderate average document age (5.13 years) suggests ongoing relevance of earlier publications, but also signals opportunities for exploring new trends, innovations, and challenges in contemporary entrepreneurship education research. Overall, these findings reinforce entrepreneurship education's prominence as a well-established, globally recognized, and continually evolving academic field.

The annual publication trend displayed in the figure 2 demonstrates a clear upward trajectory in research on entrepreneurship within higher education from 2010 to 2024. The trend began with a relatively low number of publications (around 10 articles) in 2010, gradually increasing over the subsequent years. A significant rise is observed starting from 2017, with publications consistently growing each year thereafter. The highest peak occurred in 2024, reaching approximately 110 published articles. However, an abrupt drop to fewer than 10 documents in 2025 is observed, likely due to incomplete data availability for the current year.

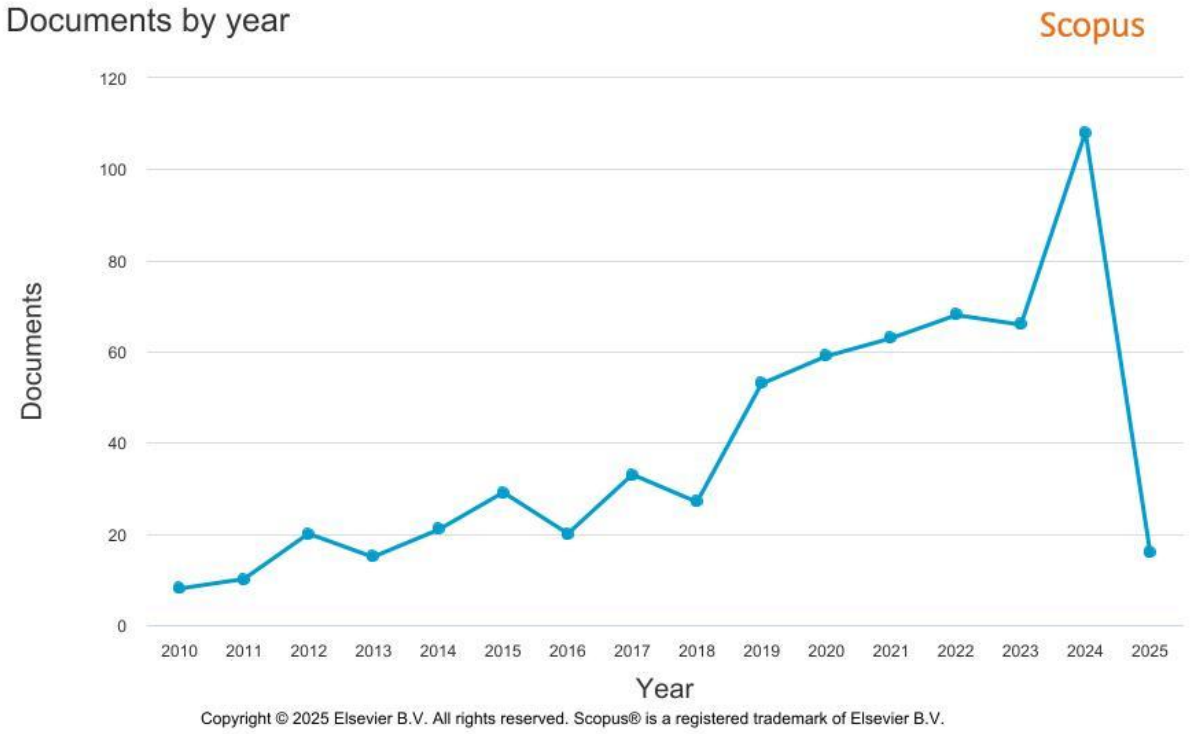

Figure 2. Publication Tren

The upward trend observed in annual publications clearly indicates a growing academic interest and sustained scholarly attention towards entrepreneurship education in higher education contexts. Notably, the substantial increase in publications between 2017 and 2024 suggests heightened recognition of the importance of entrepreneurial competencies and educational innovation within higher education systems globally. The sharp decline in 2025 does not indicate a reduction in research interest but is rather attributable to the ongoing nature of data collection for the year. Given the consistent historical growth rate, it is reasonable to project that publications in this domain will continue

to increase, further emphasizing its academic and practical relevance. Researchers and institutions should therefore anticipate and support continued exploration in this field, particularly in exploring emerging trends and potential areas for future investigation.

Figure 3. bellow illustrates the top ten most productive countries contributing to publications on entrepreneurship in higher education, as indexed by Scopus between 2010 and 2025. Spain is identified as the leading country, with the highest number of published documents, approaching 90 publications. The United Kingdom closely follows, with approximately 80 documents, while the United States occupies third place with around 60 publications. Other notable countries in the top ten include Mexico, Portugal, China, India, Germany, Brazil, and Finland, each contributing between approximately 20 and 40 documents. This distribution highlights the geographically diverse yet concentrated scholarly contributions within this research area.

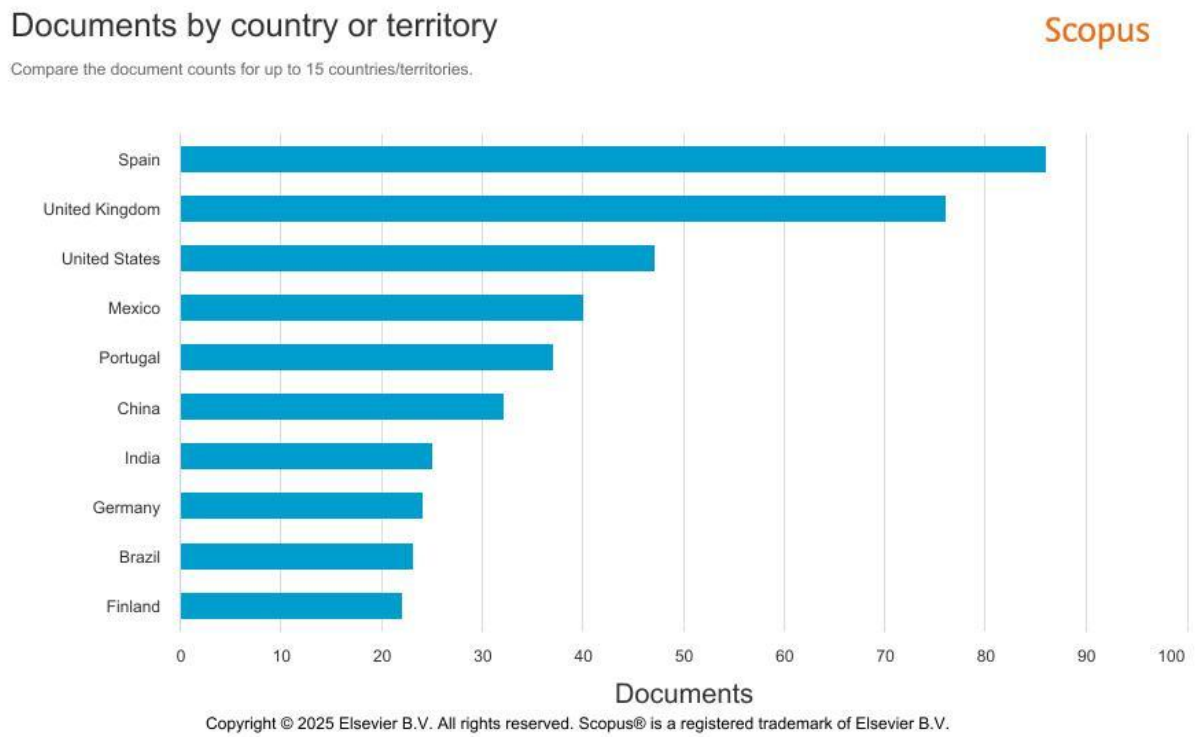

Figure 3. Most Productive Country

The dominance of Spain, the United Kingdom, and the United States in research productivity on entrepreneurship in higher education underscores their influential roles and robust academic environments fostering entrepreneurship education research. The high productivity of Spain, in particular, suggests significant national interest, policy support, and institutional prioritization of entrepreneurial education within its higher education systems. Additionally, the strong representation from European countries (Spain, United Kingdom, Portugal, Germany, Finland) indicates a regional emphasis on entrepreneurship as a strategic educational focus in Europe. On the other hand, emerging economies such as China, India, Mexico, and Brazil also reflect increasing recognition of entrepreneurship education as essential for fostering innovation and economic growth. These insights suggest potential opportunities for international research collaboration and knowledge exchange, further contributing to the global development of entrepreneurship in higher education.

Research Map

To find out the images from the research map in this research, we used VOSViewer to help visualize the research map. The visualization results in figure 4 show that there are a total of 55 keywords, 365 links and 7 clusters. The VOSviewer network visualization illustrates a keyword co-occurrence map derived from research publications on entrepreneurship in higher education. The visual representation identifies distinct thematic clusters represented by different colors. Central keywords such as "higher education," "entrepreneurial intention," "social entrepreneurship," "innovation," "technology transfer," and "higher education institutions" appear prominently, signifying their frequent use and centrality within the academic discourse. The size of each node corresponds to the keyword frequency, highlighting that "higher education" is the dominant term. The interconnectedness of the nodes indicates conceptual relationships, revealing how these thematic areas overlap and interact to shape scholarly discussions in the field.

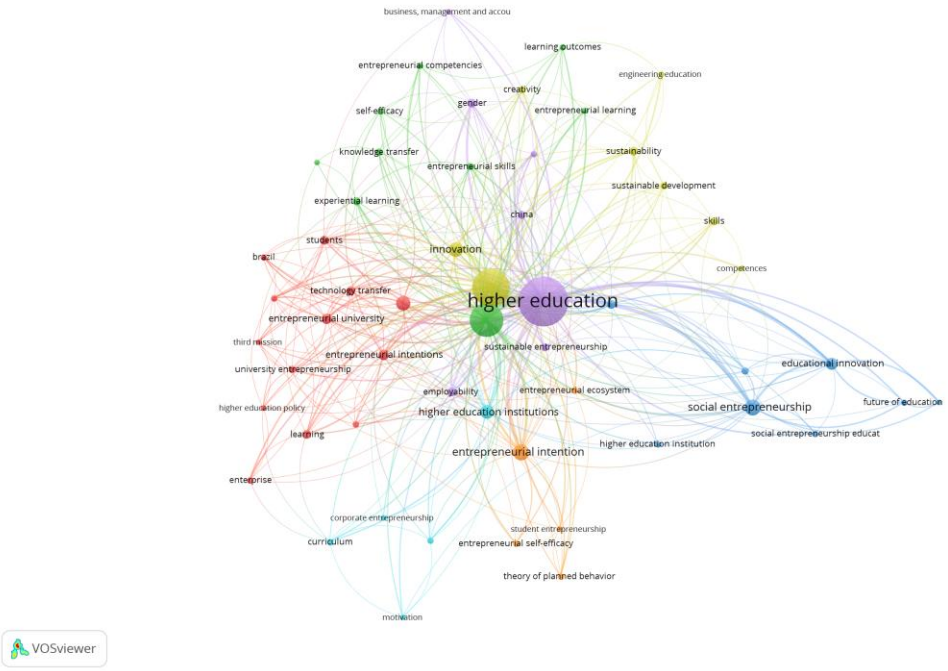

Figure 4. Network Visualization

The keyword co-occurrence visualization highlights a robust intellectual structure in entrepreneurship education research, with several thematic clusters evident. First, the largest cluster centered around "higher education" and "entrepreneurial intention" reflects research focusing on the psychological and institutional factors influencing students' intentions toward entrepreneurial behavior. Second, the cluster associated with "social entrepreneurship" and "educational innovation" emphasizes research addressing entrepreneurship's role in social value creation and innovation in teaching methodologies. Another distinct cluster related to "technology transfer," "entrepreneurial university," and "innovation" highlights universities' role in fostering entrepreneurship through knowledge transfer and innovation systems. Smaller peripheral clusters reflect specialized themes like experiential learning, self-efficacy,

sustainability, and entrepreneurial skills, signifying emerging research directions. Collectively, these thematic clusters reveal the multidimensional nature of entrepreneurship education and underline a diverse yet interconnected scholarly community actively expanding this research domain.

The network visualization identifies several clear thematic clusters:

- Cluster 1 (Central Cluster): Dominated by "higher education," "entrepreneurial intention," and "higher education institutions," this cluster signifies research examining educational policies, institutional support, and factors affecting students' entrepreneurial intentions within academic settings.
- Cluster 2 (Social and Educational Innovation): Characterized by keywords such as "social entrepreneurship," "educational innovation," and "entrepreneurial ecosystem," it highlights research on integrating entrepreneurship education with societal goals and innovative pedagogical practices.
- Cluster 3 (Technology and Entrepreneurial University): Featuring keywords like "technology transfer," "entrepreneurial university," and "innovation," this cluster underscores universities' pivotal roles in technology commercialization and innovation-driven entrepreneurship.
- Cluster 4 (Experiential Learning and Skills): Includes "experiential learning," "entrepreneurial competencies," and "self-efficacy," emphasizing the practical aspects and skill-based outcomes of entrepreneurship education programs.
- Cluster 5 (Sustainability and Future-Oriented Education): Contains keywords such as "sustainability," "sustainable entrepreneurship," and "future of education," suggesting emerging research focusing on sustainability and long-term educational impacts.

These clusters provide valuable insights into current research trends and help identify future research directions in the field of entrepreneurship education within higher education contexts.

Future Research Recommendations

Firstly, future research should further explore the role of digital transformation and technology integration in entrepreneurship education within higher education institutions. While existing research has extensively examined entrepreneurial intentions and traditional educational methodologies, there remains limited understanding of how digital tools and platforms could enhance entrepreneurial learning, skill development, and collaboration. Investigating the effectiveness, challenges, and best practices of digital entrepreneurship education could offer valuable insights for educators, institutions, and policymakers in designing more innovative and inclusive curricula.

Secondly, given the increasing importance of sustainability globally, future studies should place stronger emphasis on sustainable entrepreneurship education, addressing how higher education institutions can integrate sustainability principles into entrepreneurial programs. While sustainability emerged as a growing research cluster, deeper insights into

how students develop sustainable entrepreneurial competencies and how universities can effectively foster sustainable entrepreneurial ecosystems remain necessary. Comparative international studies or case studies examining successful implementations could greatly contribute to understanding the interplay between sustainability and entrepreneurship in education.

Finally, future research is encouraged to focus on the impact of entrepreneurship education on long-term career outcomes and socio-economic development. Current studies predominantly concentrate on short-term outcomes, such as entrepreneurial intention and immediate startup behaviors. A longitudinal research approach examining how entrepreneurship education impacts students' long-term career trajectories, employability, innovation capacity, and contributions to regional economic growth could yield significant implications for policy decisions and resource allocations in higher education.

These recommendations aim to provide clearer directions for scholars and practitioners to build upon existing knowledge, bridging current gaps and fostering meaningful development in entrepreneurship education research.

4. CONCLUSION

In conclusion, this bibliometric analysis identified a growing research trend in entrepreneurship within higher education, marked by a consistent annual publication growth rate of 4.73%, with significant contributions from countries such as Spain, the United Kingdom, and the United States as the key global research leaders. The research landscape reveals distinct thematic clusters emphasizing entrepreneurial intentions, social entrepreneurship, innovation, technology transfer, and sustainability in education, highlighting both well-established and emerging areas. To further advance this field, future research should address digital transformation in entrepreneurship education, emphasize the integration of sustainability practices, and undertake longitudinal studies examining the long-term impacts of entrepreneurial education on career and socio-economic development.

5. REFERENCE

Aria, M., & Cuccurullo, C. (2017). Bibliometrix: An R-tool for comprehensive science mapping analysis. Journal of Informetrics, 11(4), 959-975. https://doi.org/10.1016/j.joi.2017.08.007

Donthu, N., Kumar, S., Mukherjee, D., Pandey, N., & Lim, W. M. (2021). How to conduct a bibliometric analysis: An overview and guidelines. Journal of Business Research, 133, 285-296.

Donthu, N., Kumar, S., Mukherjee, D., Pandey, N., & Lim, W. M. (2021). How to conduct a bibliometric analysis: An overview and guidelines. Journal o f Business Research, 133, 285-296. https://doi.org/10.1016/j.jbusres.2021.04.070

Fayolle, A., & Gailly, B. (2015). The impact of entrepreneurship education on entrepreneurial attitudes and intention: Hysteresis and persistence. Journal of Small Business Management, 53(1), 75-93.

Guerrero, M., Cunningham, J. A., & Urbano, D. (2016). Economic impact of entrepreneurial universities' activities: An exploratory study of the United Kingdom. Research Policy, 45(3), 748-764.

Kuratko, D. F., & Morris, M. H. (2018). Examining the future trajectory of entrepreneurship. Journal of Small Business Management, 56(1), 11-23.

Maritz, A., & Brown, C. R. (2013). Illuminating the black box of entrepreneurship education programs. Education+ Training, 55(3), 234-252.

Mongeon, P., & Paul-Hus, A. (2016). The journal coverage of Web of Science and Scopus: A comparative analysis. Scientometrics, 106(1), 213-228. https://doi.org/10.1007/s11192-015-1765-5

Nabi, G., Liñán, F., Fayolle, A., Krueger, N., & Walmsley, A. (2017). The impact of entrepreneurship education in higher education: A systematic review and research agenda. Academy of Management Learning & Education, 16(2), 277-299.

Neck, H. M., & Greene, P. G. (2011). Entrepreneurship education: known worlds and new frontiers. Journal of Small Business Management, 49(1), 55-70.

Rauch, A., & Hulsink, W. (2015). Putting entrepreneurship education where the intention to act lies: An investigation into the impact of entrepreneurship education on entrepreneurial behavior. Academy of Management Learning & Education, 14(2), 187-204.

Van Eck, N. J., & Waltman, L. (2010). Software survey: VOSviewer, a computer program for bibliometric mapping. Scientometrics, 84(2), 523-538.

van Eck, N. J., & Waltman, L. (2010). Software survey: VOSviewer, a computer program for bibliometric mapping. Scientometrics, 84(2), 523-538. https://doi.org/10.1007/s11192-009-0146-3

Zupic, I., & Čater, T. (2015). Bibliometric methods in management and organization. Organizational Research Methods, 18(3), 429-472.