

Emerging Research on Entrepreneurship in Higher Education: A Bibliometric Analysis

Penelitian yang sedang berkembang tentang Kewirausahaan di Perguruan Tinggi: Analisis Bibliometrik

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Widi Aliffa Izzara^{1*}, Ganefri¹, Asmar Yulastri¹,

¹ Universitas Negeri Padang, Padang, Indonesia

*E-mail: widi.aliffa@gmail.com

Abstract

Entrepreneurship in higher education has become an important research subject in the last decade. New approaches to entrepreneurship education in universities aim to develop students' critical thinking, problem-solving and innovation skills and create new businesses. Universities worldwide have integrated entrepreneurship education into the curriculum to equip graduates with a flexible and proactive mindset through various programs and initiatives. However, in its application, entrepreneurship education faces the challenges of integrating into a rigid and dense curriculum and measuring its long-term impact. This study aims to identify and visualise publications related to entrepreneurial learning in higher education. Bibliometric analysis with primary data from the Scopus database, spanning 2014 and 2023, resulted in 799 relevant documents to be further analysed using Biblioshiny for data visualization. As a result of data filtering, 265 publications were identified, with an annual growth of 13.33%, and 672 authors contributed to the field. In-depth analysis revealed publication trends, prolific authors, active affiliations, and highly cited articles, providing a comprehensive bibliometric landscape. These insights are essential for educators, curriculum developers, and policymakers to inform the development of effective educational programs and policies and highlight the need for further research on the impact of entrepreneurial learning and the integration of digital technologies in education. This research provides a foundation for future explorations of digital entrepreneurship, charting a path for innovation and positive impact in the education sector.

Keywords: *entrepreneurship, higher education, bibliometric, bibliophily.*

Abstract

Kewirausahaan di pendidikan tinggi menjadi subjek penelitian penting dalam dekade terakhir. Pendekatan baru terhadap pendidikan kewirausahaan di universitas bertujuan mengembangkan kemampuan berpikir kritis, pemecahan masalah, dan inovasi mahasiswa, serta menciptakan bisnis baru. Universitas di seluruh dunia telah mengintegrasikan pendidikan kewirausahaan ke dalam kurikulum untuk membekali lulusan dengan pola pikir yang fleksibel dan proaktif melalui berbagai program dan inisiatif. Namun, pada pengaplikasiannya pendidikan kewirausahaan menghadapi tantangan integrasi ke dalam kurikulum yang kaku dan padat serta kesulitan mengukur dampak jangka panjangnya. Penelitian ini bertujuan untuk mengidentifikasi dan memvisualisasikan publikasi terkait pembelajaran kewirausahaan pada pendidikan tinggi. Dengan analisis bibliometrik dengan data primer dari database Scopus, rentang tahun 2014 dan 2023, menghasilkan 799 dokumen relevan untuk dianalisis lebih lanjut menggunakan Biblioshiny untuk visualisasi data. Hasil penyaringan data, 265 publikasi teridentifikasi dengan pertumbuhan tahunan 13,33% dan 672 penulis berkontribusi dalam bidang ini. Analisis mendalam mengungkapkan trend publikasi, penulis produktif, afiliasi aktif, dan artikel banyak dikutip, memberikan gambaran komprehensif tentang lanskap bibliometrik. Wawasan ini penting bagi pendidik, pengembang kurikulum, dan pembuat kebijakan untuk menginformasikan pengembangan program dan kebijakan pendidikan yang efektif serta menyoroti kebutuhan akan penelitian lebih lanjut tentang dampak pembelajaran kewirausahaan dan integrasi teknologi digital dalam pendidikan. Penelitian ini memberikan landasan bagi eksplorasi kewirausahaan digital masa depan, memetakan jalur untuk inovasi dan dampak positif di sektor pendidikan

Kata Kunci: kewirausahaan, pendidikan tinggi, bibliometrik, biblioshiny

1. Introduction

Entrepreneurship in higher education, particularly in university settings, has been a subject that has gained significant attention in the last decade. This is due to the widespread recognition that entrepreneurship is not only about business creation but also about developing critical thinking, problem-solving and innovation skills among students (Bolzani & Luppi, 2021; Pinto & KJ, 2021; Sampene et al., 2021). In an increasingly competitive and connected global context, university graduates face a job market that demands technical expertise and the ability to innovate, adapt and create new opportunities (García-Pérez et al., 2021; Goulart et al., 2022). Therefore, integrating entrepreneurship in universities is essential to prepare entrepreneurs for education and equip all graduates with a flexible and proactive mindset.

In response to these demands, many universities worldwide have introduced entrepreneurship courses, programs and initiatives to instil entrepreneurial capabilities and attitudes. From elective courses to specialized degree programs, business incubators and *start-up* competitions, universities are trying to create ecosystems that support innovation and entrepreneurship (Klein et al., 2021; Maritz et al., 2022; Mele et al., 2022). These programs focus on business and management theory and emphasize developing practical skills through real-world experience, industry cooperation, and mentorship.

However, the implementation of entrepreneurship education in universities faces various challenges. One of the main challenges is effectively integrating entrepreneurship into an already dense and often rigid curriculum without compromising the depth of other disciplines (Schuelke-Leech, 2020). There is also the question of how entrepreneurship education can be measured for its impact, given that entrepreneurial outcomes often take a long time to materialise and are challenging to measure solely by traditional metrics such as earnings or employment rates (Ross & Shin, 2024; Scott, 2024).

Therefore, the main objective of this study is to identify and visualise published research on entrepreneurial learning in the context of higher education. This analysis utilizes bibliometric analysis that will shed light on how entrepreneurship is integrated into the educational context and its implications for learning and teaching methodologies by identifying key themes, methodologies, and gaps in the existing literature.

The insights gained from this bibliometric analysis carry significant implications for educators, curriculum developers and policymakers. Understanding current trends and gaps in entrepreneurial learning research can inform the development of more effective educational programs and policies. In addition, it underscores the need for further research into the impact of entrepreneurial learning on student learning outcomes and the most effective methods for integrating digitization into entrepreneurial learning. This analysis lays the groundwork for future explorations on how digital entrepreneurship can continue to grow and positively impact the education sector.

2. Literature Review

Research on entrepreneurship in higher education has become a subject that is gaining increasing attention in response to changes in the global economy and the demands of a job market that requires graduates with academic knowledge, practical expertise and the courage to be innovative. Bibliometric analysis in this area has helped identify and map the growth and evolution of entrepreneurship research by providing empirical data on publications, citations and research trends. Research conducted by (Wang et al., 2023) highlights how entrepreneurship programs in

higher education have grown significantly and show substantial diversification in their approaches and methodologies.

The analysis also explores how entrepreneurship is integrated into the curriculum and teaching practices. Entrepreneurship-oriented curricula in higher education offer courses on how to start and run a business and teach the skills needed to think creatively and critically. This is explained in a study conducted by (Motta & Galina, 2023), who observed that effective entrepreneurship education stimulates students' personal development and enhances their ability to overcome real challenges.

One of the recurring themes in higher education entrepreneurship literature is the importance of experiential learning. According to (Liu et al., 2023) learning approaches involving students directly in entrepreneurial projects positively increase students' entrepreneurial intentions. This is supported by the increasing number of business incubators and *university start-up* competitions as a platform for students to test their ideas in a controlled yet realistic environment.

Then, a study conducted by (Grooters et al., 2023) showed that entrepreneurial experiences in higher education also significantly affect the development of non-academic skills such as teamwork, project management, and leadership. This research confirms that such experiences help students build new businesses and their professional careers as innovative and proactive employees.

While some research has focused on the benefits of entrepreneurship education, some challenges and barriers arise. Research (Miço & Cungu, 2023a) outlines that one of the main challenges is integrating entrepreneurship education into the existing education system, which often emphasizes formal education over practical learning. This raises the question of how educational institutions can create a balance between theory and practice and between academic and entrepreneurial expertise.

When it comes to measuring the impact of entrepreneurship education, (Soltanifar & Smailhodžić, 2021) (stated that many studies have tried to measure the direct impact of entrepreneurship education on new firm creation but have paid less attention to long-term impacts such as changes in mindsets and attitudes towards entrepreneurship. Therefore, further research assessing the long-term impact of entrepreneurship education is crucial.

Finally, recent bibliometric analysis highlights the importance of understanding the impact of technology and digitalization on entrepreneurship education as expressed by (Secundo et al., 2021) said that the development of digital technologies has opened up new opportunities for entrepreneurship education, including online learning tools and open educational resources.

This creates opportunities for universities to offer entrepreneurship education that is more flexible and accessible to students from diverse backgrounds. The bibliometric analysis reveals that entrepreneurship in higher education is a dynamic field with much potential for innovation in teaching and learning. Despite the constraints, the opportunity is great for educational institutions to adapt and respond in ways that support the development of entrepreneurial talent among students and, ultimately, foster economic growth and social innovation.

3. Research Methods

This research uses a bibliometric analysis method by accessing the Scopus journal database as the primary data source (Baas et al., 2020; AlRyalat et al., 2019; Pham-Duc et al., 2023), The Scopus database offers extensive features and coverage. This is because it has the advantages of comprehensiveness, high reputation, a strong citation network, consistency of data standards, and

the ability to conduct continuous analysis. (Pölönen et al., 2020; Gusenbauer, 2022), These qualities make Scopus the number two reference source after WOS, trusted and qualified to produce research findings. This research was conducted using specific search queries to find relevant documents under the conditions of (TITLE (entrepreneurship) AND TITLE-ABS-KEY (higher education)) AND PUBYEAR > 2013 AND PUBYEAR < 2024 AND (LIMIT-TO (DOCTYPE, "ar") OR LIMIT-TO (DOCTYPE, "cp")) AND (LIMIT-TO (LANGUAGE, "English")). This research filtered out topics related to entrepreneurship and higher education. In addition, researchers also limit the research year to a range of 2014 - 2023.

This bibliometric analysis is directed at exploring and understanding the scientific literature on entrepreneurship in higher education. The aim is to provide an in-depth picture of the direction and scope of research on entrepreneurship in higher education and to identify research gaps in this field. As a result, 799 documents matching the search criteria were identified, which will be further analyzed to uncover trends, key topics, and significant contributions to this research related to entrepreneurship research in higher education. The study utilized Biblioshiny software for data visualization, which provides functionality in descriptive data processing and conceptual analysis of the collected dataset. (Watrianthos et al., 2023; Watrianthos et al., 2022; Ahmad et al., 2023).

4. Results and Discussion

From the data screening stage on the Scopus database related to the topic of entrepreneurship research in higher education, 265 publications were obtained in the 2014-2023 range, which is divided into 180 sources of journals and books, etc. At the growth rate in publications related to this topic, there is a percentage of 13.33. In addition, 672 authors have contributed to research related to entrepreneurship in higher education. This shows that the interest of researchers and academics who discuss topics in this field is relatively high.

The results and discussion of this research are divided into sub-discussions consisting of publication trends and trend analysis. The publication trends are also divided into the top ten most productive authors, top ten most productive affiliations, top ten most productive sources and top ten most cited articles. These results and discussions make the publication picture map the bibliometric landscape to inform future research directions.

4.1. Publication Trends

Exploring lesser-known areas of entrepreneurship in higher education through bibliometric analysis is an essential approach to identifying gaps and emerging trends in the field. This process typically involves a comprehensive examination of the existing literature to map various research topics' frequency, relationships and development. In entrepreneurship in higher education, under-researched areas may include topics such as the integration of entrepreneurial practices, the impact of digital technology on entrepreneurship, and the dynamics of entrepreneurship in the current era.

Bibliometric analysis in this context will use the Scopus database to collect publication data related to entrepreneurship in higher education. This analysis can focus on several key aspects, including the number of publications over time to identify trends, citation analysis to measure the influence of specific works, author networks and collaborations to understand the academic landscape in the field, and keyword frequency analysis to detect emerging themes and under-researched areas.

The results of this analysis are expected to be useful for researchers, policymakers, and practitioners in higher education, especially in entrepreneurship learning. This analysis's results can guide future research, inform policy development, and address emerging and critical issues

comprehensively. This publication trend analysis results are divided into several analyses, including the top ten most productive authors, top ten most productive affiliations, top ten most productive sources and top ten most cited articles.

The relationship between publication trends, the most prolific authors, affiliations, associated sources, and the most cited articles is complex and reflects the dynamics within a research field. Publication trends are influenced by the collective research efforts of prolific authors, the institutions with which they are affiliated, and the sources through which they choose to disseminate their work. (Borgman & Furner, 2002). Prolific authors and affiliates who consistently contribute significant amounts of research shape the direction of these trends. In addition, influential sources play an essential role in publication trends, as researchers often target these sources for publication, influencing the areas that take centre stage. Correspondingly, highly cited articles, often written by prolific individuals or published in influential sources, significantly influence the research direction (Kanmounye et al., 2021). These articles introduce revolutionary concepts, methodologies or findings, attracting attention and encouraging further exploration of related themes.

The first analysis, related to publication trends, discusses the most productive authors discussing research topics related to entrepreneurship in higher education. Table 1 presents 5 authors who have produced many publications on entrepreneurship research in higher education. This analysis can help researchers in making the author who contributes the most to conducting this research as a reference. The total number of authors obtained from the analysis is 2000. In Table 1, 5 authors have been filtered as productive authors in conducting and publishing research on entrepreneurship in higher education.

Table.1. Top Five Most Productive Author

No	Authors	Record Count	Affiliation
1.	Vazquez-Parra, Jose Carlos	11	Tecnológico de Monterrey
2.	Ramirez-Montoya, Maria Soledad	10	EGADE Business School
3.	Cruz-Sandoval, Marco	8	Universitat Politècnica de Catalunya
4.	Carlos-Arroyo, Martina	7	Universidad del Valle de Atemajac
5.	Maritz, Alex	7	La Trobe Business School

Table 1 shows no dominant author in research related to entrepreneurship in higher education. The table identifies the 5 most prolific authors on entrepreneurship research in higher education. The table provides information on the number of records (publications) credited to each author and academic affiliation. This is an essential component of bibliometric analysis as it provides insight into those individuals whose contributions are significant in advancing understanding of the topic.

Jose Carlos Vazquez-Parra from Tecnológico de Monterrey took the top spot with 11 publications, followed by Maria Soledad Ramirez-Montoya from EGADE Business School with 10 publications. This presence shows that Latin American institutions significantly contribute to the literature on entrepreneurship in the higher education sector. This may reflect the regional solid

approach and specific dedication to entrepreneurship in the curricula and research at these institutions.

Marco Cruz-Sandoval from Universitat Politècnica de Catalunya and Martina Carlos-Arroyo from Universidad del Valle de Atemajac, with 8 and 7 publications, respectively, confirm that Spain and Mexico are important centres of this research activity. The strong presence of researchers from these two countries in this list highlights the importance of entrepreneurship in higher education in Southern Europe and Latin America. It shows the potential for international collaboration in future studies.

Alex Maritz from La Trobe Business School also has 7 publications, signifying that Australia is an essential contributor to this global research. The involvement of institutions from three continents - America, Europe, and Australia - in this list confirms that entrepreneurship in higher education is a subject of global interest, crossing a whole gamut of geographical and cultural boundaries.

Not only does this table highlight who the thought leaders are in higher education entrepreneurship, but it also shows the geographical diversity in academic leadership. When linked to a broader bibliometric analysis, this data helps identify research patterns, collaboration networks, and regional and global trends in entrepreneurship research. This information is beneficial for higher education institutions, policymakers, and researchers looking to build partnerships, develop study programs, and design innovative and effective research strategies.

In addition to the results of the top ten most productive authors, this study also identifies the affiliations of authors who research entrepreneurship in higher education. Figure 1 presents data from affiliates worldwide who contributed to this research. The total affiliations obtained from the analysis are 753, and in Figure 1, researchers filtered into 10 affiliations that are most productive in producing research related to entrepreneurship in higher education.

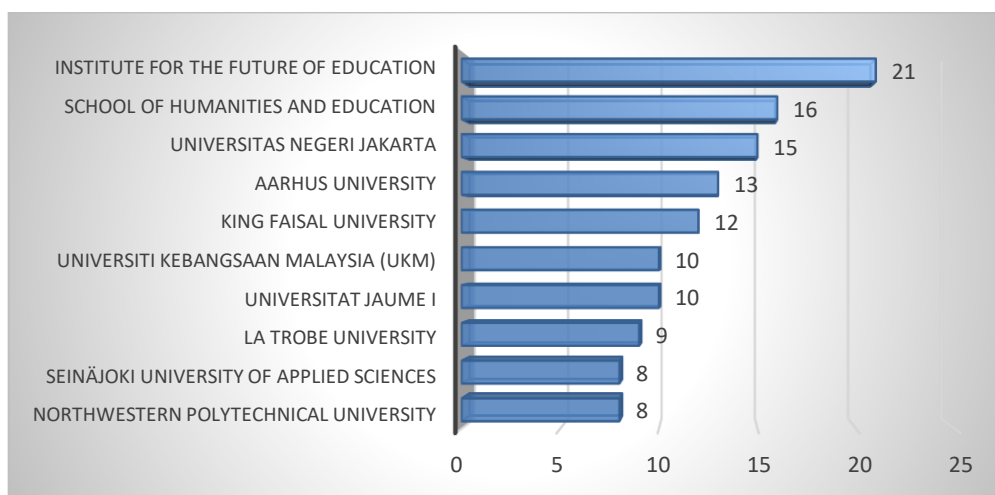


Figure.1. Top Ten Most Productive Affiliations

Figure 1 shows a TreeMap visualization representing the number of publications, contributions, or related metrics of the various affiliations. The size of each block correlates with the number associated with each university, indicating a quantifiable measure of output or impact in a particular entrepreneurship-related area in higher education, as seen from bibliometric analysis. This graph can provide insight into entrepreneurship research's geographical and institutional distribution. For example, the "Institute for the Future of Education" takes the top spot with 21 publications, indicating that this institution may have a dedicated program or robust

research focus on entrepreneurship. It is followed by the "School of Humanities and Education" with 16 publications, indicating a possible interdisciplinary approach in integrating entrepreneurship with humanities and education.

The presence of "Universitas Negeri Jakarta" marks a significant contribution of an educational institution in Indonesia to the corpus of entrepreneurship research in higher education. With 15 publications, this university has prioritized entrepreneurship in its research agenda, which may reflect the shift in higher education policy in Indonesia to include entrepreneurship as an essential component in economic development and social innovation.

Moreover, the variation between universities on this list highlights that entrepreneurship research is not exclusive to institutions focusing on business studies; universities with expertise in other disciplines also make significant contributions. This shows that entrepreneurship is considered an essential and impactful competency, not only limited to the traditional business context but also an essential element in other disciplines such as engineering, education, and humanities. This has resulted in university curricula increasingly integrating entrepreneurial principles into their educational programs, creating graduates ready for innovation and leadership in various sectors.

In addition to analyzing the affiliation origin of the researchers, information about the number of publications in specific journals is also analyzed in the results of this study, as it can help determine the direction of further research. For example, if a journal has many publications on a particular topic, it can signal that the topic is important and worthy of further investigation. Figure 2 presents 10 journals that produce many publications on entrepreneurship research in higher education. From this analysis, it can help in choosing journals for the publication of research results later. If the research corresponds to a topic widely discussed in a particular journal, submitting a paper can be a good choice. The total number of journals obtained from the analysis is 406, and in Figure 2, researchers filtered into 10 journals that are most productive in producing research related to entrepreneurship in higher education.



Figure.2. Top Ten Most Productive Sources

Figure 2 shows 10 journal sources that have productivity in producing publications related to entrepreneurship in higher education, based on bibliometric analysis. Each block represents one journal or conference, and its size is proportional to the number of publications produced,

indicating how productive the researcher is in this field. The numbers in each block indicate the number of related publications.

The largest block, "Sustainability (Switzerland)," with 37 publications, indicates that the journal is leading the way in publishing research on entrepreneurship in higher education, focusing on sustainability. This reflects the current global trend where sustainable entrepreneurship is a critical topic, combining innovation with social and environmental responsibility. The journal's presence at the top of the treemap confirms the importance of this topic in current academic discourse.

"Proceedings of the European Conference on Innovation and Entrepreneurship," with 25 publications, and "International Journal of Management Education," with 23 publications, also stood out, demonstrating the importance of international conference platforms and journals in the dissemination of the latest research and knowledge exchange on entrepreneurship in higher education. These conferences and journals offer a forum for academics and practitioners to discuss and develop the latest practices in entrepreneurship and management education.

Furthermore, "Education and Training" has 34 publications and "Journal of Entrepreneurship Education" has 22 publications, which marks these two journals as essential contributors to the higher education entrepreneurship literature. The journal "Education and Training" indicates that education and training approaches in entrepreneurship are becoming an important topic, underlining the importance of formal education in supporting entrepreneurship. Meanwhile, the "Journal of Entrepreneurship Education" highlights the specificity of the field in providing academic and practical insights into the best ways of educating future entrepreneurs.

This analysis allows stakeholders, such as educators, researchers and policymakers, to identify critical sources that can provide insights and the latest research in entrepreneurship in higher education. By understanding which sources produce the most research, stakeholders can better target where other researchers seek information and where other researchers want to publish their research. The presence of journals and conferences from different disciplines also demonstrates the importance of a collaborative and multidisciplinary approach in addressing the challenges and opportunities of entrepreneurship in higher education settings.

Table.2. Top Ten Most Cited Articles

No	Title	DOI	Citations	TC
1.	The impact of entrepreneurship education on the entrepreneurial intention of students in science and engineering versus business studies university programs (Maresch et al., 2016)	10.1016/j.techfore.2015.11.006	351	39,00
2.	Learning apart and together: towards an integrated competence framework for sustainable entrepreneurship in higher education (Lans et al., 2014)	10.1016/j.jclepro.2013.03.036	299	27,18

3.	Does entrepreneurship education in the first year of higher education develop entrepreneurial intentions? The role of learning and inspiration (Nabi et al., 2018)	10.1080/03075079.2016.117716	224	32,00
4.	Entrepreneurship Education through Successful Entrepreneurial Models in Higher Education Institutions (Boldureanu et al., 2020a)	10.3390/su12031267	190	38,00
5.	The impact of entrepreneurship education on the entrepreneurial mindset of college students in China: The mediating role of inspiration and the role of educational attributes (Cui et al., 2021)	10.1016/j.ijme.2019.04.001	143	35,75
6.	Coronavirus (Covid-19) and the entrepreneurship education community (Ratten, 2020)	10.1108/JEC-06-2020-0121	139	27,80
7.	The climate for entrepreneurship at higher education institutions (Bergmann et al., 2018)	10.1016/j.respol.2018.01.018	113	16,14
8.	The moderating role of entrepreneurship education in shaping entrepreneurial intentions (Shah et al., 2020)	10.1186/s40008-020-00195-4	94	18,80
9.	Factors influencing university support for sustainable entrepreneurship: Insights from explorative case studies (Fichter & Tiemann, 2018)	10.1016/j.jclepro.2017.12.031	93	13,29
10.	The value of an educated population for an individual's entrepreneurship success (Millan et al., 2014)	10.1016/j.jbusvent.2013.09.003	90	8,18

Based on the data in Table 2, we can see the 10 most influential articles over the last 10 years related to research on entrepreneurship in higher education, based on bibliometric analysis. This table is an integral part of bibliometric analysis, showing the most influential articles in this domain. In the context of "Emerging Research on Entrepreneurship in Higher Education," this

analysis provides insight into what topics dominate academic discussions and how they impact the research community.

The first article, "The Impact of Entrepreneurship Education on Entrepreneurial Intention of Students in Science and Engineering Versus Business Studies University Programs," shows that entrepreneurship education significantly impacts students' entrepreneurial intentions, with a clear separation between science and engineering disciplines and business studies. This reflects the importance of understanding how entrepreneurship education is tailored to different academic backgrounds and how this influences students' motivation to engage in entrepreneurship (Boldureanu et al., 2020b).

The second title, "Learning Apart and Together: Towards an integrated competence framework for sustainable entrepreneurship in higher education," highlights the need for an integrated competence framework. The focus on sustainability signals a growing awareness of the importance of entrepreneurship, which is not only economically but also socially and environmentally responsible. It also illustrates the trend in entrepreneurship education that integrates individual and collective learning (Miço & Cungu, 2023b).

The third article, which questions the role of entrepreneurship education within the first year of higher education in developing entrepreneurial intentions, reveals the importance of early intervention in entrepreneurship education. It suggests that the inculcation of an entrepreneurial mindset should start early in university education to maximize its effects (Ogwunte, 2023).

This overall table confirms that entrepreneurship education in higher education is a rich and multifaceted area of research, with a strong emphasis on the effects of education on entrepreneurial intentions, the development of sustainable entrepreneurship models, and the influence of changing cultural contexts and global situations. Bibliometric analysis such as this is crucial in identifying research trends, mapping academic influences, and guiding future research in entrepreneurship in higher education.

4.2. Trend Analysis

Trend investigation provides essential information and insights into the dynamic changes within a particular research area. Observing and analyzing patterns in the publication pool over time reveals the development of academic interest, research methods, and topic focus within the area. This analysis is an essential tool for various parties involved in the research world. Co-occurrence analysis is a bibliometric technique to identify trends and patterns in specific literature. This method comes from the assumption that keywords or terms that often appear together in one document have a stronger relationship than can be explained by chance. In the context of trend analysis, co-occurrence analysis can recognize emerging topics, track the development of research themes over time, and even project future research directions. In addition, trend analysis can be used as a reference for research gaps.

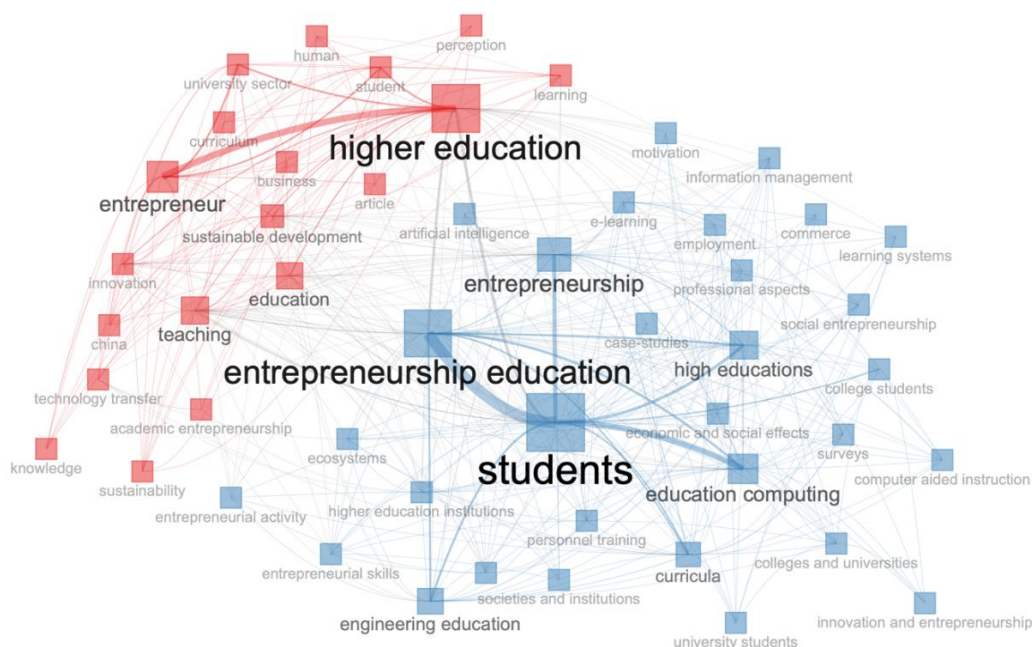


Figure.3. Co-Occurrence Analysis

Figure 3 is a visualization of the network analysis that illustrates various concepts related to entrepreneurship in higher education. Through this analysis, it is possible to understand how the topic "Emerging Research on Entrepreneurship in Higher Education: A Bibliometric Analysis" may materialize in the broader corpus of academic research.

At the centre of the network, the keyword "students" dominates, indicating that students are the main focus of entrepreneurship-related research in higher education settings. This reflects the current trend where universities place the student experience at the core of entrepreneurship education, recognizing that a student-centred learning approach is critical to developing entrepreneurial qualities among the younger generation (Sioukas, 2023).

The keywords "higher education" and "entrepreneurship education" are strategically linked, suggesting a close relationship between the academic environment and the delivery of entrepreneurship education. This may include curriculum, teaching methods, and institutional resources used to support entrepreneurship education. This relationship emphasizes the importance of curricular design and institutional infrastructure in developing entrepreneurship programs (Güneş, 2023; Sholeh et al., 2023).

At a deeper level, keywords such as "innovation," "sustainability," and "technology transfer" are seen to be connected with "entrepreneur" and "higher education," suggesting that recent research involves an emphasis on innovation and sustainability in entrepreneurship. This suggests that universities are not only focusing on creating new businesses but also on developing ideas that can promote social and economic sustainability (Wirba, 2023).

The connection between "teaching" and "entrepreneurship" highlights the critical role that lecturers and educators play in informing and inspiring aspiring entrepreneurs. Modern research explores teaching methods and pedagogical approaches that can enhance the entrepreneurial learning experience and enrich students' entrepreneurial competencies (Nájera-Sánchez et al., 2023).

Buzzwords such as "education computing" and "e-learning" reflect the role of digital technologies in entrepreneurship education. New research may explore how digital platforms and

online learning tools can be used to increase access to entrepreneurship education and enrich the learning process, including using artificial intelligence to personalize education and innovation in teaching. (Sulistianingsih, 2023; Vázquez-Villegas et al., 2024).

Overall, this visualization highlights emerging research areas in entrepreneurship in higher education and reveals a complex network of related concepts. Bibliometric analysis on this topic can help researchers and policymakers understand the direction of current trends and identify research gaps and opportunities for future studies that will improve entrepreneurial practices in higher education.

5. Conclusion

This research provides a comprehensive insight into the evolution and dynamics of entrepreneurship in higher education, utilizing bibliometric analysis to map the relevant literature and highlight trends and key contributors in this field. The results show an increasing interest in this topic, confirmed by the growth of publications and the diversity of geographical, disciplinary, and institutional contributions. It was found that entrepreneurship education is given severe weight in higher education curricula, emphasizing developing graduates' critical thinking competencies, creativity, and adaptability to meet the demands of a competitive global job market. This analysis confirms the need for a multidisciplinary approach involving industry and academia collaboration and the integration of digital technologies to facilitate effective and innovative entrepreneurial learning.

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