A Bibliometric Analysis of Entrepreneurial Intention: Insights from VOSviewer and RStudio Bibliometrix (2004-2024)

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ABSTRACT

The goal of this review is to conduct a bibliometric analysis of the study associated with entrepreneurial intention. The analysis includes a total numbers of 1,727 papers published between 2004 and 2024. The research aims to identify trends related to entrepreneurial purpose, the leading journals in this field, prolific authors, and the countries that are most frequently cited. The co-authorship network-map, intercountry co-authorship network map, and keyword co-occurrence maps are consequently provided. Scopus database was used to evaluate the substantial data regarding the numerous Publications incorporated into this investigation. A co-authorship map, an inter-country co-authorship network map, and a keyword co-occurrence network map were produced using the VOSviewer software. RStudio software was employed in this investigation to analyze the most prominent journals, prolific authors, countries' scientific production, and word maps of keywords and prevalent topics. The study's findings demonstrate that Education and Training is the most significant journal, with the highest no. of papers published in the Year 2024. Additionally, the most distinguished author is "Francisco Linan" with 21 papers, and the most cited country is Spain with 5134 citations. The word map of keywords shows the term "entrepreneur" occurs most frequently in the data set.The study enhances the existing body of literature regarding entrepreneurial intention. Bibliometric methodologies present a complete and reliable overview of this field. The findings may assist authors in seeking further research on this subject. The paper claims that it is the most valuable bibliometric study on entrepreneurial intention, offering current insights through the use of both Vosviewer and Rstudio software to facilitate a more comprehensive understanding.

Keywords: Entrepreneurial intention, entrepreneurial intentions, bibliometric analysis, VOSviewer, RStudio.

Introduction

Over the last two decades, there has been an increased knowledge of the relevance of entrepreneurship and the emergence of new ventures, since innovation and companies are seen to be vital drivers of economic progress and prosperity (Díaz-García & Jiménez-Moreno, 2010). Entrepreneurship is the driving force behind economic expansion; it is responsible for the generation of employment opportunities, the encouragement of innovation, and the facilitation of business opportunities, all of which are fundamental for global socioeconomic advancement Berger & Kuckertz (2016). The definitions that are most commonly used for the research that is associated with entrepreneurship are as follows: "Capitalizing on an opportunity regardless of available resources" Stevenson & Jarrillo-Mossi (1986) in other words, "The method of inferring, thinking, and behaving that emphasizes the significance of recognizing opportunities and the overall approach and specific leadership." At the same time, Kearney et al., (2008) defined entrepreneurship as a perspective that an enterprising individual believes essential, rather than as a psychological state. The dominant concept in contemporary study is Miller's (1983) notion, which posits that entrepreneurship involves the

reconfiguration or redistribution of resources through innovation, an entrepreneurial mindset, and a propensity for risk-taking to create new value. Entrepreneurship fundamentally incorporates a proactive spirit that challenges or transforms established standards by effectively adapting to changing scenarios with innovation and creativity.

The entrepreneurial process commences with the formulation of entrepreneurial goals and progresses through the implementation of commercial activities, including the initiation and management of new businesses. According to Davidsson et al. (1997), intention is an active mental state that precedes action and directs attention towards the ultimate objective of founding a new firm (Bird, 1988). According to Liñán & Chen (2009) Intentions are a critical component to evaluate when deciding to begin a new business, as supported by a growing body of study. Actually, it has been determined that EIs directly influence certain entrepreneurial behaviors, including his exploration and discovery of new company opportunities Krueger and Carsrud (1993).

As a matter of fact, it has already been established that EIs directly influence certain entrepreneurial behaviors, including the process of search and discovery of new company opportunities. (Linan & Fayolle (2015). As entrepreneurial intention studies gain popularity in the literature, researchers must be aware of advances and developing patterns in the various sectors where intention is investigated. It is extremely important because information concerning entrepreneurial intentions can be significantly enhanced by the dispersed, interdisciplinary and often, contradictory contributions that have directly or indirectly shaped the literature on entrepreneurship (Ferreira et al., 2021). According to Liñán & Fayolle (2015) In the last thirty-five years, there has been a notable rise in studies focused on entrepreneurial goals. A diverse array of research investigations has been undertaken on several topics related to entrepreneurial goals. Only a few researches have conducted bibliometric analyses or reviews of the research on the propensity for entrepreneurship. Liñán and Fayolle (2015) completed the most valuable review study to date. The authors conducted a comprehensive evaluation of evidence on entrepreneurial inclinations from 2004 to 2013. A total of 409 papers from 2007 to 2013 were analyzed. Following that, Dolhey (2019) conducted a bibliometric analysis of research on entrepreneurial intentions. The study evaluated a total no. of 1,393 publications published from year 2000 to 2018. Scholars have done bibliometric analyses on entrepreneurship and related issues, such as social business ownership (Ferreira et al., 2021; Rey-Martí et al., 2016), entrepreneurship in rural areas (Pato & Teixeira, 2016), and entrepreneurship and small company (Volery & Mazzarol, 2015). The majority of research lacks systematization and categorization, often starting from scratch with each new study. According to Fayolle et al., (2006) the field may become stagnant and lack of robustness. A comprehensive review of the present literature reveals that few studies have conducted bibliometric analyses on entrepreneurial inclinations, which this study aims to address.

The present research aims to address the following questions:

- What is the relationship between the development of entrepreneurial intention and publication of documents in reputed journals?
- What are the number of articles on entrepreneurial intentions published in the past by the highest number of journals?
- What are the prolific writers?
- Which are the most cited countries?
- Which countries' authors have the most frequent collaborations with authors from other nations?
- What keywords are associated with entrepreneurial intent, and how do they co-occur?

Research Methodology

Scientometric, or bibliometric, analysis is an approach to assessing research that entails the analysis of a variety of literature sources. Ellegaard and Wallin (2015) proposed an alternative method for conducting biblio analysis, as indicated by the body of literature on the subject. The bibliometric method is a recognized technique utilized in study evaluation and analysis. It involves the application of statistical methods to assess and measure academic publications. The bibliometric analysis method employs quantitative analysis to illustrate the productivity, collaboration tendencies, and effects of scientific publications. Bibliometric mapping has the potential to enhance scientific comprehension and knowledge dissemination. This method optimizes information processing to converting public metadata into maps or visualizations; therefore, it provides significant insights. Keyword visualization can assist in the identification of research themes or clusters within a particular field. Furthermore, the geographic coverage of a journal is demonstrated by the mapping of author connections, while the recognition of emerging technologies is facilitated by the mapping of institutional and multinational collaborations.

These examples illustrate the importance of bibliometric mapping in research, as per Tanudjaja and Kow (2018).

This study performs a bibliometric analysis to evaluate research concerning entrepreneurial intention from 2004 to 2024. It is generally utilized to measure variations in a certain area of research (De Bakker et al., 2005). This analysis offers relevant and essential information for professionals and experts to assess scientific activity. The Scopus database was utilized to search for publications published between 2004 and 2024 pertaining to entrepreneurial aims. The Scopus database contains a higher number of records than the PubMed, Web of Science, and Dimension databases. (Bartol et al., 2014). Scopus is recognized for having the most complete abstract and citation database of peer-reviewed literature in multiple disciplines (Kuntolaksono et al., 2022; Mongeon and Paul-hus, 2016). The main terms were combined in a search query utilizing the Boolean operators "AND" and "OR," together with a temporal constraint of "YEAR." Papers were searched using the "TITLE-ABS-KEY" field with the criteria of (Entrepreneurial intention OR Entrepreneurial intentions) and publication years greater than 2004 and less than 2024. The search filter was designed to specifically locate publications with the term "entrepreneurial intention" or "entrepreneurial intentions" in their title, abstract, or keywords. This study solely includes articles, excluding all other document types (e.g., letters, reviews, etc.). Publications that fairly portray the findings of unique research endeavors are known as articles (Benavides Velasco et al., 2011). To ensure that all of the papers in the search results were relevant to given topic, the author carefully read their titles, abstracts, and keywords. Out of the 1,760 materials, 33 publications addressed relatively disparate topics hence, they were excluded from the investigation. The total remaining 1,727 publications were deemed suitable for the study's purpose.

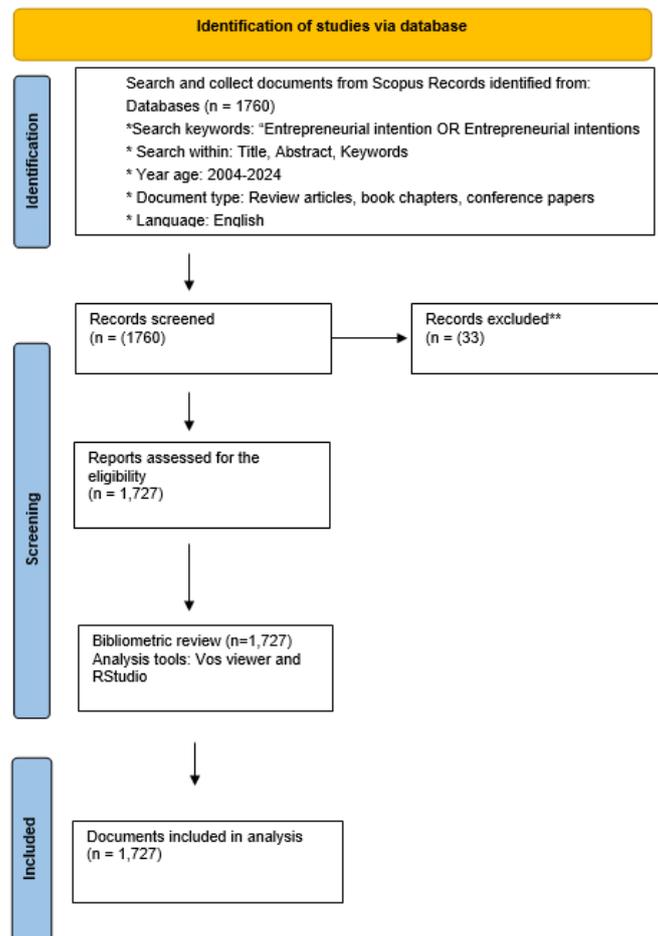727 publications were deemed suitable for the study's purpose.

Figure 1

Table 1 was constructed using R's software, which contains main study data. The data is derived from 477 sources, which includes journals and books.

Table 1: Summary of the Bibliometric Study

Description	Results
Time period	2004:2024
Sources (journals, books, etc.)	477
Documents	1727
Annual Growth Rate %	32.45
Average Citations Per Doc	29.43
Document Average Age	4.96
References	86334
Authors' Keywords (DE)	3003
Keywords Plus (ID)	644
Authors	4099
Collaboration of Single-Authored Docs	180
Authors of Single-Authored Docs	156
International Co-authorships%	30.11
Co-Authors per Doc	3.14
Document Article	1727

Source: Author's Compilation

The database has 1727 documents and has grown at a rate of 32.45% annually. The mean age of the documents is 4.96 years. A typical document contains 29.43 citations. There are 644 keywords plus 3003 writers' keywords. The database has 4099 authors. There are 156 writers of single-authored publications, while 180 single-authored documents are the result of author collaboration. On average, each document has 3.14 co-authors. The accumulation of documents contains 1727 articles. This information refers to the dataset's time coverage and sources, documents, authorship, and document types.

Annual Scientific Production
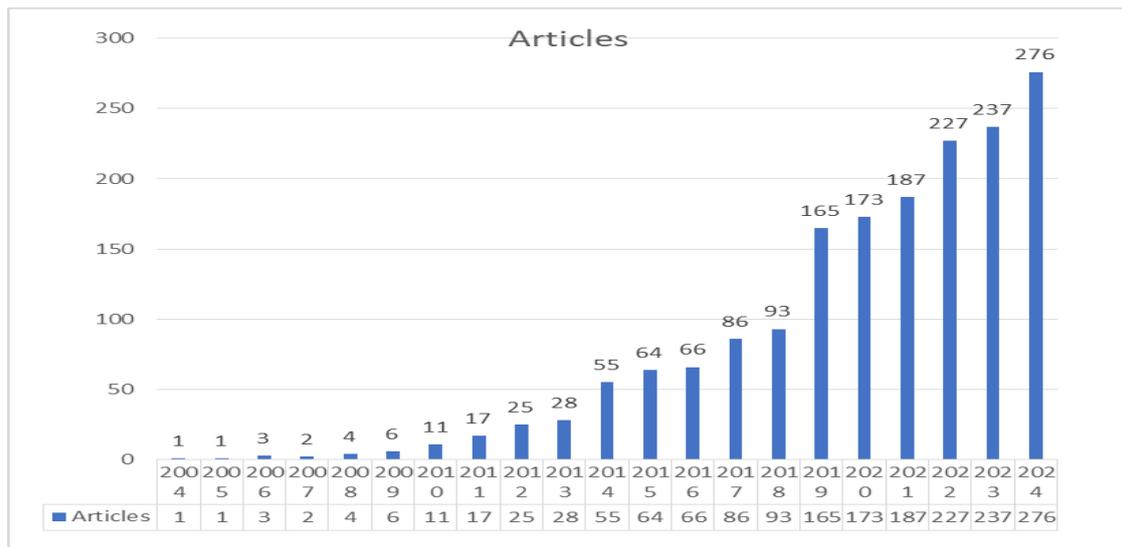
Figure 2: Annual generation of scientific findings

Source: Author's compilations

Figure 2 illustrates the annual rise in scientific results calculated by the number of publications published each year from approximately 2004 to 2024. During the initial years, which ranged from 2004 to approximately 2012, the number of publications observed a gradual but consistent increase, showing that there was moderate research activity during this period. However, the rate of publication began to considerably increase around 2012, which is an indication of growing curiosity or greater emphasis in the relevant research field. After 2012, there was an increase in the annual output of scientific research. In the last few years, mainly from 2018, the chart shows a notable rise in scientific productivity, with the quantity of publications attaining the highest level by 2024.

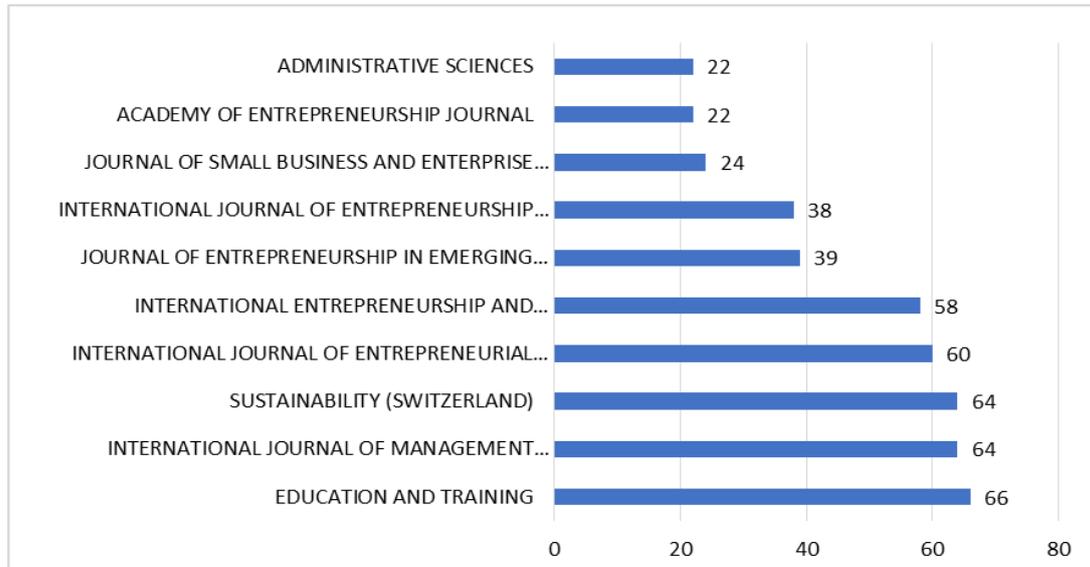**Journals With Maximum Publications**

Figure 3: Journals With Maximum Publications

Source: Author's Compilation

According to Ullah et al. (2023), a journal, conference, proceeding, or book that is mentioned in one or more of the bibliographic collection's items is considered a source. Figure 3 shows the results of the ten most pertinent sites that have published research articles on entrepreneurial intention. This study has a total of 1,727 publications, all of which are published in their respective 478 journals. The result is based on the Scopus data. Among these top journals, four belong to Emerald publishers ("Education and Training," "International Journal of Entrepreneurial Behavior and Research," "Journal of Entrepreneurship in Emerging Economies," and "Journal of Small Business and Enterprise Development") and two to the MDPI ("Multidisciplinary Digital Publishing Institute") Publisher ("Sustainability" and "Administrative Sciences"). The rest of the journals belong to Elsevier, Springer, Allied Business Academies, etc. The topmost journal, Education and Training, which has disseminated 66 publications, is associated with Emerald Publishers.

Authors

Most Prolific Authors

Figure 4: Most Prolific Authors

Table 2: Top 10 Authors

Authors	Articles
LINAN F	21
WIBWOW A	17
DUONG CD	15
SALEEM I	14
NARAMADITYA BS	12
ANWAR I	11
BALUKU MM	9
PURWANA D	9
RODRIGUES RG	9
GARCIA-RODRIGUEZ FJ	8

Source: Author's compilations

Figure 4 illustrates the ten most pertinent authors. This study attributes all 1727 publications to their respective 4099 authors. A list of the top 10 writers with the highest number of articles was compiled after analyzing the data. Moreover, it was determined that the preeminent author on entrepreneurial aim is Prof. Francisco Linan, with a total of twenty-one publications. The area of entrepreneurship, as well as entrepreneurial intents and education, is the focus of Prof. Francisco Liñán's research. The Sten K.

Johnson Centre for Entrepreneurship (Lund University, Sweden) presented the author with the 2024 European Entrepreneurship Education Award. The cognitive aspects of entrepreneurial behavior and processes are the main focus of his research.

Professor Wibowo A is the second most prolific author, having published seventeen papers. The author presently has a professorship in the business administration department at Diponegoro University. His primary expertise lies in innovation and management competencies.

The third author, Duong CD, has authored fifteen papers. The author is an associate professor at the National Economics University in Vietnam. His research interests include Corporate Social Responsibility (CSR), Sustainable Development, and Entrepreneurship.

Additionally, the next significant author is Saleem I, who has authored fourteen publications. The author presently works as a lecturer at Aligarh Muslim University. His research interests encompass finance, microfinance, human resource management, and entrepreneurship. Moreover, his primary area of expertise is human capital management.

The fifth important author is Bagus Shandy Narmaditya, with twelve papers. The author is currently a lecturer at the faculty of economics at Negeri Malang University, Indonesia. His core skills and expertise are in economic development, economic education, and entrepreneurship education.

The sixth author is Anwar I, with eleven papers. The author is currently working at Sir Padampat Singhania University as an assistant professor in the faculty of management. His major research domains are entrepreneurial intention, entrepreneurial education, telecommuting, and consumer behavior.

The subsequent three authors, Baluku M, Purwana D, and Rodrigues RG, each have nine papers. Martin Mabunda Baluku is a researcher whose primary focus is on entrepreneurship education and refugee entrepreneurship. At Universitas Negeri Jakarta in Indonesia, Dedi Purwana is an assistant professor of business at the Faculty of Economics. He wants to teach people how to be entrepreneurs, what motivates them, and their goals. R.G. Rodrigues is a researcher at the University of Beira Interior in Portugal. The author's primary emphasis is on entrepreneurial intention and entrepreneurship within European nations.

Francisco J. Garcia Rodriguez, the tenth author, has authored eight papers. He is currently employed as a professor of business management and entrepreneurship at Universidad de la Laguna. Entrepreneurship education, corporate social responsibility, and entrepreneurship comprise his primary interests.
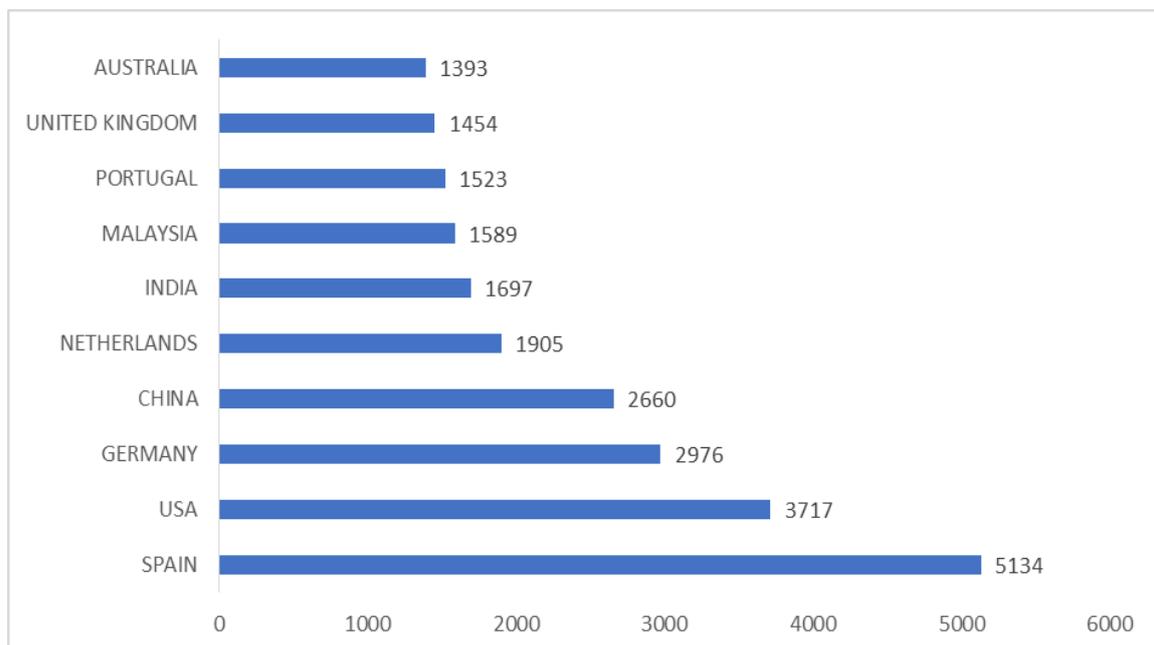
Most Cited Countries

Figure 5: Most Cited Countries

Source: RStudio results

Figure 5 displays the top ten countries with the most cited papers. People from 92 different countries wrote all the papers in this study. Spain leads with 5,134 mentions in this study. In Spain, important studies on entrepreneurship have come from places like the University of Valencia and the Autonomous University of Barcelona, which are active research centers and institutions. Spanish researchers also cooperate globally, especially on EU-funded initiatives, which boosts their global exposure and effect. In Spain, significant young unemployment and a national focus on entrepreneurship as a vehicle for economic growth have prompted substantial study on entrepreneurial intention. The USA, Germany, China, and the Netherlands are the next top countries with maximum citations. After this, India shows its significant influence with 1697 citations. Malaysia, Portugal, the United Kingdom, and Australia also demonstrate impactful research activity.

Country-Specific Scientific Production

Table 3: Top country-specific scientific production

Region	Frequency
SPAIN	411
INDONESIA	377
MALAYSIA	359
INDIA	351
CHINA	329
USA	275
PORTUGAL	188
UK	165
GERMANY	139
SOUTH AFRICA	122

Source: Author's Calculations

Country-wise Scientific Production
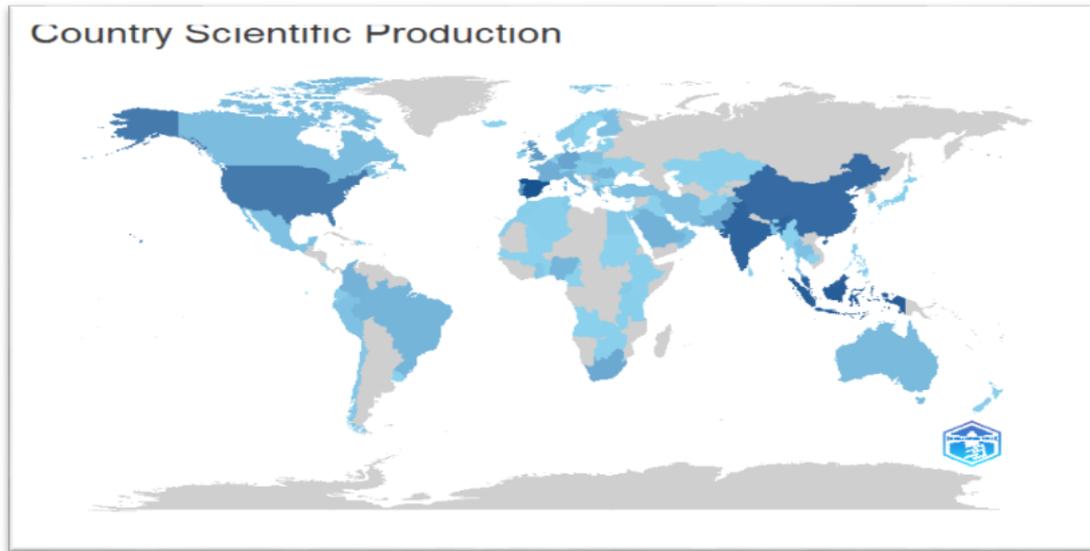
Figure 6: Scientific production by country-specific

Source: RStudio

Scientific output produced by the nation was generated using RStudio and "Biblioshiny." Blue density indicates distinct productivity rates. Dark blue indicates high productivity, while grey indicates a lack of publications (Fusco et al. 2020). The above table presents precise information regarding the top 10 producers, with Spain as the leader with 411 publications, followed by Indonesia with 377 publications, Malaysia with 359 publications, India with 351, and China with 329 publications. The United States, Portugal, the United Kingdom, Germany, and South Africa are also in the top ten, which indicates how much they have done for scientific research.

Word Map of Keywords

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Table 4: Top 10 keywords

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Terms	Frequency
Entrepreneur	86
Student	55
Perception	34
Education	31
Students	25
Entrepreneurial Intention	23
Business	21
University Sector	21
Higher Education	18
Public Attitude	16

Source: Author's Calculations

Map of keywords

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Figure 7: Map of keywords

Source: Results from RStudio

</div>

The keyword "entrepreneurial intention" appears 51 times. The words that people use the most are "perception," "entrepreneur," and "student." The keywords used in the selected field of study are education, students, business, and entrepreneurial intentions, as illustrated in the figure. Additionally, the figure illustrates the less frequent use of the terms "university sector" and "higher education," with only 18 and 21 occurrences, respectively.

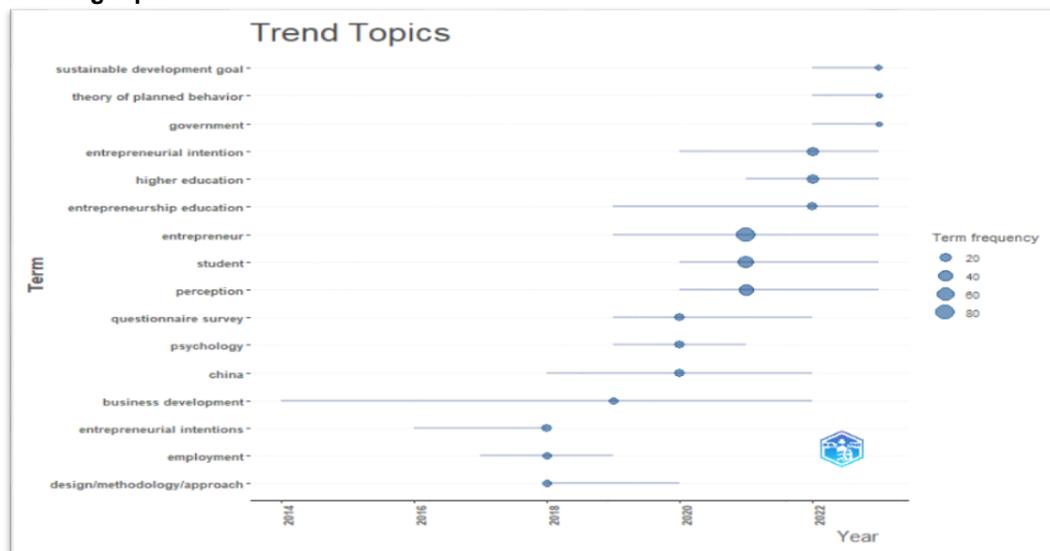**TrendingTopic**

<div align="center">

Figure 8: Trending Topics Source: RStudio results

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The figure 8 depicts research trends involving particular terms and their importance. In 2014, the graph demonstrates that research predominantly concentrated on terms such as "business development" and "design/methodology/approach," which were notably significant throughout this period of time. Key phrases like "entrepreneurial intention," "entrepreneur," and "higher education" demonstrate constant engagement during the entire period, maintaining an ongoing study concentration from 2013 to 2023. Emerging areas like "perception" and "psychology" have undergone substantial increases, especially in the latter years, from 2021 to 2023.

- **Co-authorship network analysis**

In the above study, a co-authorship network analysis was carried out with the help of the software VOSviewer 1.6.9. The software application known as VOSviewer can create and display bibliometric maps. Maps of authors or journals can be created by using co-citation data, while maps of keywords can be created by using co-occurrence data (Van Eck et al., 2010). Both maps can be created using the same tool. The acronym VOS refers to the "Visualization of Similarities." The analysis of the co-occurrences within the articles was done to determine the degree of connection between the terms.

A map of the co-authorship network
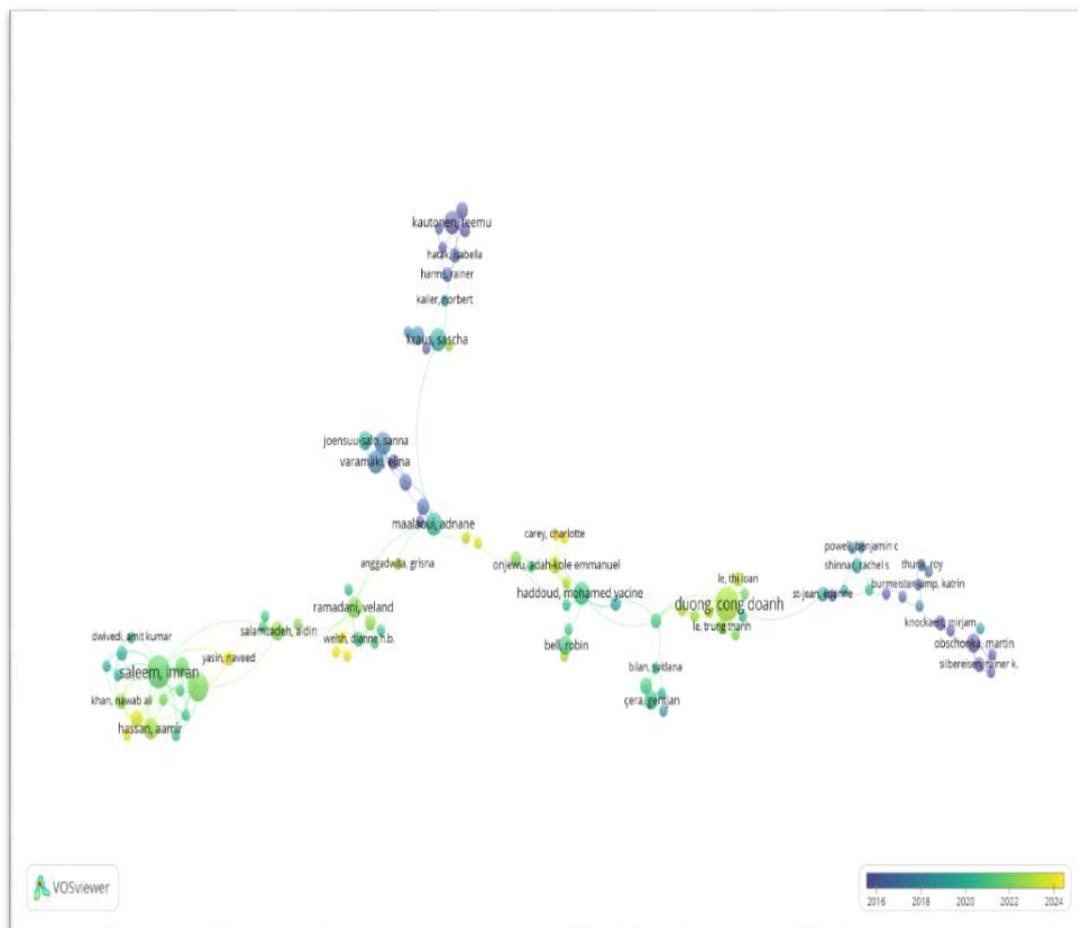
Figure 9: Network map of co-authorship

Source: VOS viewer results

The co-authorship network analysis plots the relationship of collaboration amongst the authors and reveals the people who collaborated with the greatest number of the remaining contributors in the dataset. This research study included a total of 4246 authors in the sample set. The software only created a network map by incorporating only writers who worked with two or more authors in the dataset. By these criteria, the largest group of authors as identified by the software, had co-authored in a group, and it comprised of 669 authors.

The software classifies the authors in separate clusters. Authors in the same cluster Co-authorship between authors implies a close relationship. There are eleven clusters in total. The largest cluster is Cluster 1 with fifteen authors, cluster 2 has thirteen authors and Cluster 3 has thirteen authors. The most common co-authors the author Linan F. has been working with are the highest number of co-authors in the dataset. The above section has determined the author that had the highest number of works in reference to the entrepreneurial intentions.

- **Intercountry co-authorship network analysis**
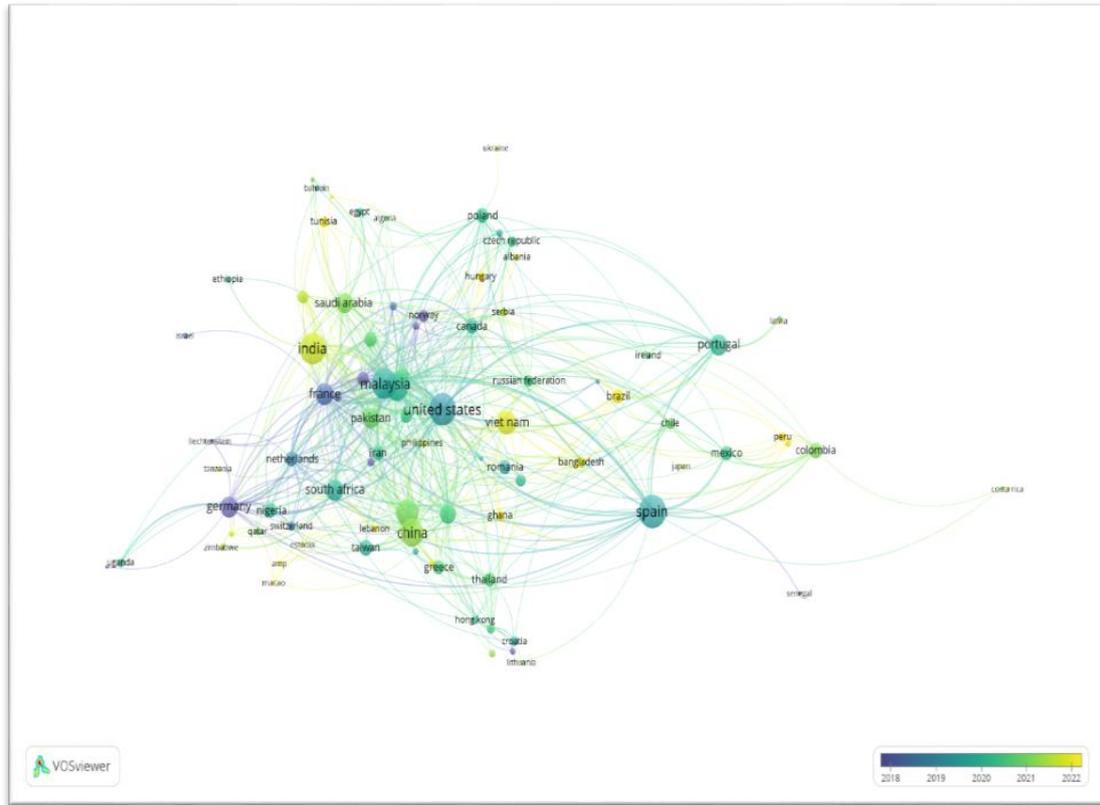
Figure 10: Analysis of the inter co-authorship network

Source: VOS viewer results

This section presents an examination of the network of inter-country co-authorship. Its objective is to ascertain which authors from various countries have collaborated with those from other countries. The dataset comprised 121 nations. The software found that 92 of them were connected via co-authorship. Table 5 demonstrates that authors from the UK, the US, China, Malaysia, Spain, and India have worked together the most with authors from other countries.

Table 5: Top 10 countries

Country	Total Link Strength
United Kingdom	169
United - States	141
China	109
Malaysia	99
Spain	98
France	92
Pakistan	81
Australia	70
India	69
Germany	62

Source: Author's Calculation

Table 5: Top ten countries with the most co-authored works with authors from other countries.

- **Keyword co-occurrence network a**
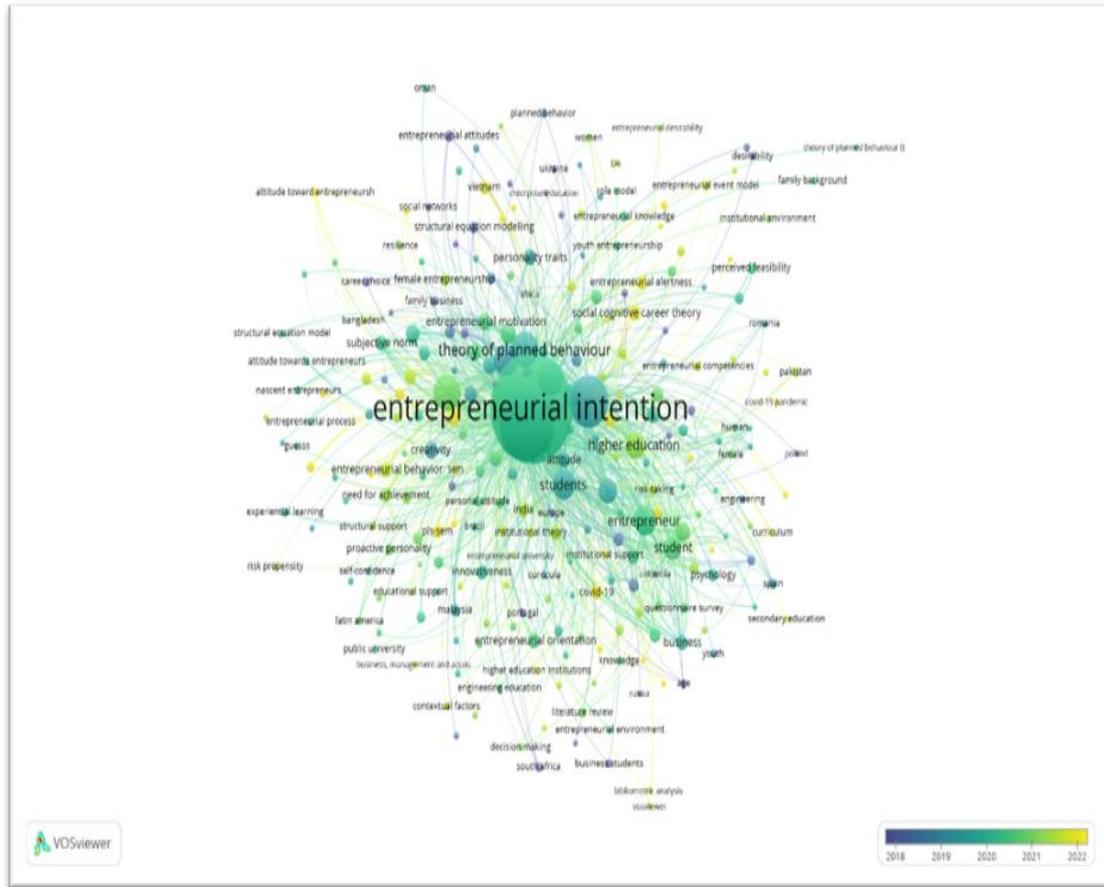
Figure 11: Keywords: analysis of co-occurrence networks
Source: VOS viewer results

       The most frequently used words in the various articles of this investigation are identified through network analysis. This analysis provides insight into the issues and themes that scholars have mainly emphasized. The keywords "entrepreneurial intention" and "entrepreneurial intentions" occur a total of 1,735 times in the dataset. The dataset contained a total of 3,406 keywords. Only the 230 terms that occurred more than five times in the dataset were chosen for the creation of a network map. Numerous additional keywords—entrepreneurial education, entrepreneurship, and theory of planned behavior—were identified in the dataset. Table 6 presents the 10 most often occurring keywords in the dataset. The map depicts numerous keywords linked by various lines. The lines signify these terms have appeared together in numerous papers within the dataset.

Table 6: Top 10 Keywords

Keywords	Co-occurrences
entrepreneurial intention	1202
entrepreneurial intentions	533
entrepreneurship education	297
entrepreneurship	279
entrepreneurial self-efficacy (ESE)	138
theory of planned behavior	133
self-efficacy	124
theory of planned behavior	118
entrepreneurial education	110
gender	102

Source: VOS viewer results

- **Keyword co-occurrences network map with author keywords**

Figure 12: Network map of keywords and co-occurrences

Figure 12 illustrates the co-occurrences of significant terms on a network map, accompanied by the authors' keywords (entrepreneurial intention, entrepreneurial ambitions). The figure offers a succinct summary of the geographical areas, methodology, and topics investigated. The researchers often focus on this subject of entrepreneurial goals. The co-occurrence of the keywords "entrepreneurial intention" and "university students" indicates that numerous studies have been undertaken regarding the entrepreneurial intentions of university students.

Conclusions, limitations, and directions for future research

The findings of this study indicate that the past nineteen years have witnessed extensive research on entrepreneurial objectives. The study's research questions reflect that the journal with the greatest publication volume on entrepreneurial objectives is Education and Training, published by Emerald Group Publishing. Francisco Linan is the most prolific author. Consequently, as determined by the VOS viewer program, the same author exhibited the highest frequency of co-authorships with other authors in the dataset employed in this study. Spain possesses the largest quantity of cited documents. Furthermore, the analysis of the keyword co-occurrence network demonstrated that the most frequently occurring keywords are "entrepreneurial intention. Further, the dataset identified entrepreneurial education, entrepreneurship, and the theory of planned behavior keywords. Further, the dataset identified entrepreneurial education, entrepreneurship, and the theory of planned behavior keywords.

Future researchers can benefit from the limitations of this study. This investigation initially only included documents published between 2004 and 2024. Future analysis may expand its scope. We exclusively used the Scopus database to search the papers in this study, ensuring that we excluded publications from journals not indexed in Scopus. Our study's limitation is that our bibliometric evaluation is limited to one database, specifically Scopus, which is considered the most reliable for capturing academic research (Valenzuela et al., 2017). In the future, similar analyses may also be implemented with an alternative database, such as Web of Science. Third, this study only included publications

identified as English-written. Foreign language papers were excluded. The subsequent constraint is that, in particular, the data set utilized in this study was exclusively sourced from the Scopus search results. This study excludes unpublished articles, PhD theses, and master's and doctoral dissertations on ambitions for entrepreneurship. Future research can gather data from all of these sources. The stated limitations suggest that this inquiry is incomplete. Still, an intensive bibliometric examination is considered essential. This investigation includes a couple of significant papers.

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