
The Synergy Between Entrepreneurship, Innovation And Higher Education: Bibliometric Analysis

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Abstract

The incorporation of entrepreneurial innovation in higher education and its effect on changing conventional paradigms are examined in this essay. In light of the quickly changing technological world, the study highlights the importance of students developing entrepreneurial attitudes. It also explores the relationship between academic fields, skill integration, and innovative thinking in higher education.

By means of bibliometric analysis, the study investigates the publication evolution, regional distribution, publishing domains, and prominent authors within the realm of entrepreneurial innovation in further education. The research notes a global pattern in the spike in interest observed between 2019 and 2021. In terms of encouraging entrepreneurial thinking, the US is at the forefront, followed by China, the UK, and other countries that fund initiatives that unite the public and private sectors.

The dispersion of entrepreneurial initiatives throughout multiple domains, including business management, computer sciences, economics, engineering, and social sciences, is indicative of their multidisciplinary nature. A considerable amount of knowledge about entrepreneurship in higher education has been added by the top ten authors, which include Ramirez-Montoya, Vazquez-Parra, Almeida, and others. The trend toward integrating entrepreneurial innovation into higher education is evident globally, as the bibliometric data shows. The study highlights the significance of cultivating entrepreneurial mindsets in forming future leaders and innovators, and it promotes continued research and deliberate initiatives to build creative problem solvers.

Key words: *Entrepreneurship; Innovation; higher Education; Synergy; Bibliometric analysis.*

1. Introduction

The incorporation of entrepreneurial innovation has become a revolutionary force in the ever-changing field of higher education, redefining conventional paradigms and creating a dynamic learning environment. With the speed at which technology is developing and the world becoming more interconnected, it is becoming more and more clear that educational institutions must help students develop entrepreneurial attitudes.

(Mayhew et al. 2012) Notably, prior literature has been investigating several aspects that can be improved by educational activities, e.g. students' entrepreneurial intention, entrepreneurial self-efficacy IN and innovation capacities

Higher education's use of entrepreneurial innovation cuts over traditional divisions between academic fields and encourages the integration of information, skills, and original thought. It

marks a shift from universities' historical function as information-only distributors to becoming centres that inspire and nurture the following generation of creative thinkers and problem solvers. This paradigm change is a reflection of the realization that academic competence alone will not be sufficient to prepare students for the difficulties of an unpredictable future; they also need to be able to adapt, innovate, and create.

The main forces behind and difficulties in incorporating entrepreneurial innovation into higher education will be looked at in the study that follows. Through an analysis of global best practices and successful case studies, our goal is to reveal the profound effects that can result from encouraging an entrepreneurial attitude in students. In the end, our investigation aims to further the current conversation about how higher education shapes the future generation of leaders and innovators.

Key words: Entrepreneurial, Innovation, Higher education

2. Research methodology

This research conducted a bibliometric study, developed into four phases: evolution of publications on entrepreneurial innovation in higher education, definition Geographical distribution of publications, ranking of most used domains in publishing and citation of top 10 authors in the world in entrepreneurial innovation in higher education, we used the following keywords: “Entrepreneurship”, “innovation”, and “higher education”. The choice of keywords was based on popularity, which primarily uses the frequency of keywords that are generally identified as important search topics for bibliometric analysis. A frequency threshold is generally used to filter the keywords. One database was chosen to develop this study – Scopus.

So, the bibliometric data was collected from the Scopus and processed by the VOS Viewer software. We chose Scopus as it allows the identification of several measures such as the analysis of research based on the number and patterns of citations, the identification of trends in research patterns, and the quantitative evaluation of research results.

The definition of the study database has the ability to determine the limits of the research, since the entire portfolio of articles, after being examined, can be built through the results obtained in the defined database. The research was conducted taking into account some specific parameters, namely the results were limited to articles published between 2019 and 2023. The search was not limited in relation to the language of the publications. (Van Eck N. J. et al, 2014) The software used in this bibliometric analysis is the VOS Viewer. It has the advantage of using a new and proven relationship measure (Visualization of similarities [VOS] mapping) and then having an easy-to-use interface, despite it presents less advanced options. The VOS Viewer uses the distance approach and an association strength normalization to visualize networks.

3. Bibliometric analysis of entrepreneurial innovation in higher education

We will treat in this part the evolution of publications on entrepreneurial innovation in higher education, Geographical distribution of publications, distribution by domain of entrepreneurial innovation in higher education and Analysis of the bibliographic network.

3.1. Research growth: evolution of publications on entrepreneurial innovation in higher education

Documents by year

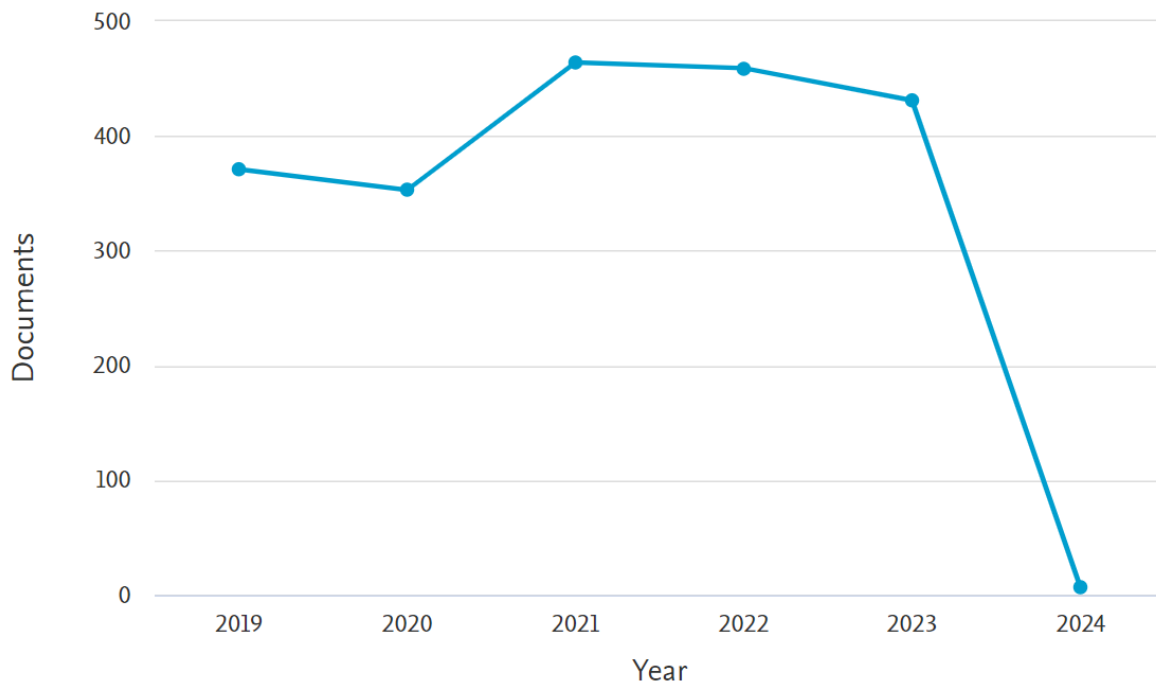


Figure 1. Total publications on entrepreneurial innovation in higher education from 2019 to 2023

The information regarding the term "innovative entrepreneurship in higher education worldwide" shows an intriguing historical pattern. The variation in the quantity of documents between 2019 and 2023 may be a sign of different levels of attention, study, or focus on this subject in scholarly and professional circles.

The number of documents increased from 380 in 2019 to 475 in 2021, indicating that creative entrepreneurship is receiving more attention in higher education. This increase may be explained by the way educational systems are developing and by the realization that entrepreneurship is an essential component of both intellectual and commercial advancement.

Nonetheless, it may be worthwhile to investigate the minor decline to 470 documents in 2022 and the additional decrease to 430 documents in 2023 (up until December 15). It might have to do with modifications to governmental emphasis, adjustments to global economic situations, or changes in scholarly priorities.

Examining the causes of these variations may yield important information on the dynamics of scholarly interest and research in creative entrepreneurship in higher education. To find out more about the particular facets of this subject that scholars are concentrating on and whether

any new trends or difficulties have emerged recently, it would be intriguing to look into the substance of these materials.

3.2 Geographical distribution of entrepreneurial innovation in higher education publications

Entrepreneurial innovation is a vital and dynamic element of higher education that promotes economic growth, scientific advancement, and societal improvement. The role of universities and other academic institutions in promoting entrepreneurship is growing as nations struggle to remain competitive in the global economy. This introduction examines the citation countries that have successfully integrated entrepreneurial innovation into their higher education systems.

In recent times, several nations have taken the lead in promoting entrepreneurial thinking within their academic institutions. These countries recognize the need of providing students with the information and outlook necessary to confront the difficulties of a rapidly changing world. Entrepreneurial innovation in higher education is encouraging professors and students to have an entrepreneurial attitude in addition to delivering groundbreaking research.

Creating an atmosphere that supports academic entrepreneurship is one of the distinguishing features of these citation-producing countries. These nations have invested in laws, plans, and initiatives that foster collaboration between educational institutions, corporations, and the general public. They recognize the mutually beneficial relationship that exists between theoretical research and practical application, fostering an environment that fosters the development of innovative ideas and their conversion into feasible solutions.

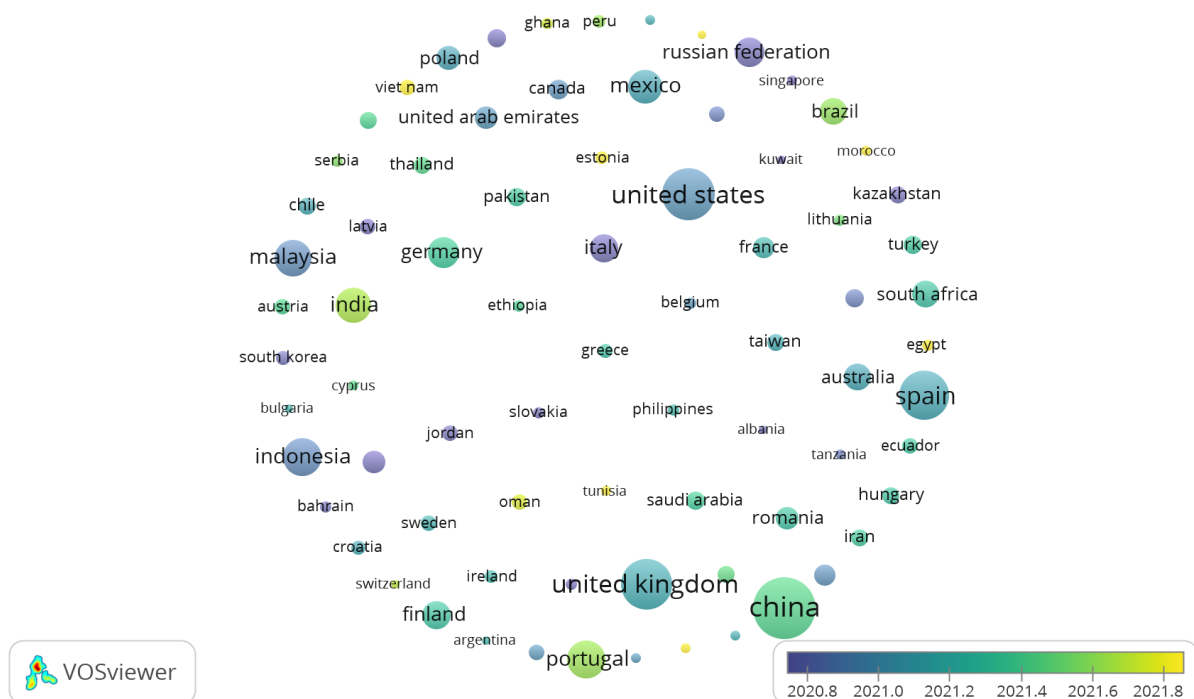


Figure 2. Geographical distribution of publications

When it comes to creative entrepreneurship in higher education, the US is at the forefront.

(Art Barnard et al, 2018) explain that there are four key areas are highlighted that describe the primarily challenges and distinctiveness of entrepreneurship education in the community college setting: curricular effectiveness, emphasis, degree and non-degree programs

The thriving network of research facilities and universities encourages risk-taking and inventiveness, which propels entrepreneurial endeavours. It is clear that China is committed to supporting innovation in higher education. Chinese universities are vital to the advancement of entrepreneurship and technical innovations because they make large investments in R&D.

The UK has a long history of intellectual distinction, and its universities play a significant role in fostering creative business. Groundbreaking efforts are fuelled by the robust partnership between academia and industry. (A.J. Smith et al, 2006) Academic policy and decision makers need to be convinced of the value in offering such courses before they can be inserted into mainstream programmes Spain's higher education institutions are showing an increasing emphasis on entrepreneurship education. The nation's dedication to fostering innovation is seen in the surge of entrepreneurial endeavours arising from its academic institutions.

Malaysia is moving forward with incorporating entrepreneurship into its system of higher education. (Raja Suzana Raja Kasim, 2011) The focus is on entrepreneurship which is at times, expressed either in the development of the quazi firm, technology transfer offices and research groups. The nation's reputation for encouraging innovation is a result of its emphasis on developing an academic setting that is favorable to startups.

More and more people are realizing how important Indonesia's higher education system is in promoting creative entrepreneurship. The nation's dedication to fostering entrepreneurial endeavors within academic institutions is apparent in the increasing quantity of prosperous businesses. (Jhon U. Blesia et al, 2019) Entrepreneur Program, in 2009 and the Indonesian Students Entrepreneurship Expo Programs. However, various economic, political and other social issues of the country have posed great challenges in the successful implementation of these programs. Portugal is becoming a center for innovative entrepreneurship in higher education. The cooperative endeavors of academic establishments and industrial associates foster a flourishing ecosystem that facilitates entrepreneurial endeavors. (Lisete Mónico et al, 2021), The main activities of universities are knowledge transfer (teaching) and knowledge creation (research). (Ratten, 2017) However, universities have had to adapt to the environmental conditions and to assert their role within the economy, generating new ideas and looking toward future trends

Russia's system of higher education is making a significant contribution to the country's dynamic entrepreneurial environment. Russian universities, with an emphasis on R&D, are essential in propelling technical progress and the startup culture. (Zobnina M et al, 2019) A panel of 21 Russian Universities was used to verify the integrated UEE model using the method of co-operative inquiry. The role of entrepreneurial courses in UEEs is illustrated herein with the use of 4 cases of Russian universities

When it comes to encouraging entrepreneurship in its universities, Mexico is leading the way. The dynamic climate for innovation and startup success in Mexico is being fostered by the partnership between academia and industry. For instance; (May Portuguese Castro et al, 2019)

the long-term model proposed by the Government of Nuevo León continues, with the extension of the Strategic Program in Science, Technology, and Innovation.

Germany's reputation for innovation is largely attributed to its esteemed universities. Germany is a leader in academic-to-business initiatives due to its strong emphasis on research and collaboration. Notably, (Carolin Bock et al, 2020) The content of education programmes addressing innovation and their impact on students' skillset has been a growing field of interest within higher education research.

3.3 Distribution by domain of entrepreneurial innovation in higher education

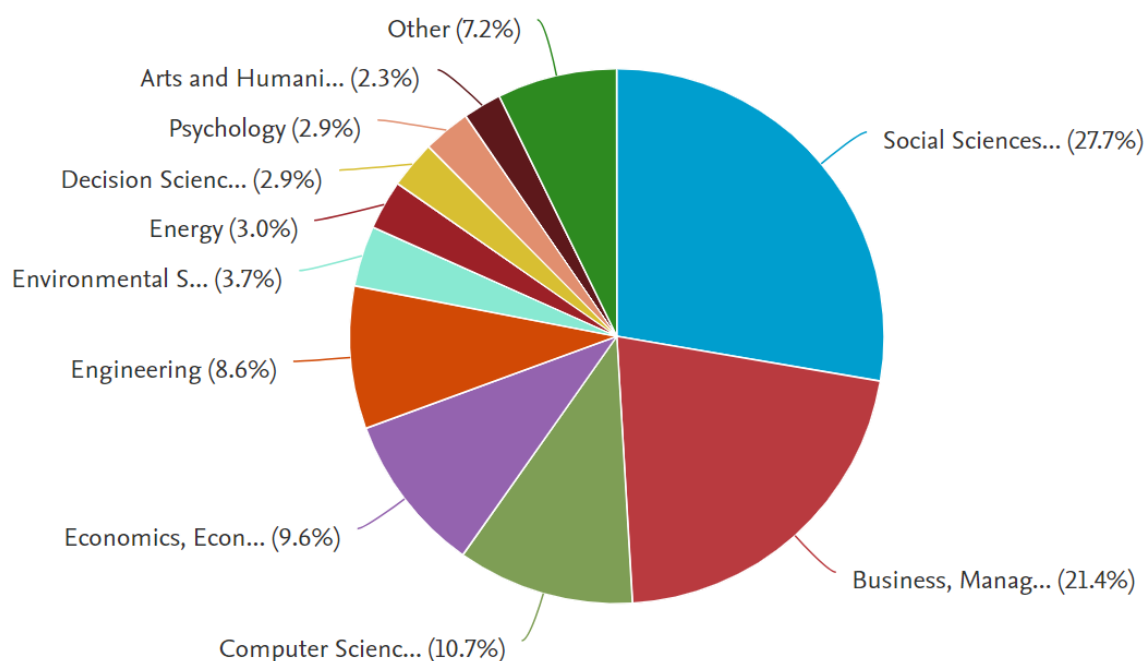


Figure 3. Ranking of most used domains in publishing

An intriguing overview of the popularity of "innovative entrepreneurship in higher education" across a range of academic disciplines is given by this rating. The Social Sciences' dominance at the top (27.7%) indicates how interdisciplinary entrepreneurial initiatives are becoming more widely acknowledged. Following closely at 21.4% is business management, which highlights the significance of both strategic and practical abilities in navigating the complicated corporate environment of today.

There is a strong correlation between technology-driven innovation and entrepreneurial endeavours, as evidenced by the noteworthy representation of Computer Sciences (10.7%). Almeida, F. (2020) The EntreComp framework was adopted in the context of a polytechnic higher education institution in Portugal to assess the development of entrepreneurial skills of students from two courses (i. e., management, and computer science). We mention also

Engineering (8.6%) in the top five. A crucial role is also played by economics (9.6%), which illustrates the relationship between creative teaching methods and economic principles.

The ranking's placement of Environmental Sciences (3.7%) and Energy (3.0%) highlights the growing significance of sustainability and environmentally conscious entrepreneurship. While psychology (2.9%) recommends an appreciation of the human element in creative educational approaches, decision sciences (2.9%) emphasize the crucial role that data-driven decision-making plays in entrepreneurial endeavours.

The fact that Arts and Humanities (2.3%) made it into the top ten indicates that entrepreneurship is approached holistically, taking into account the creative and cultural aspects of innovation in higher education. All things considered, this ranking shows a changing environment in which a variety of academic fields work together to support an entrepreneurial mindset and bring academia into step with the changing demands of the modern world.

3.4 Analysis of the bibliographic network

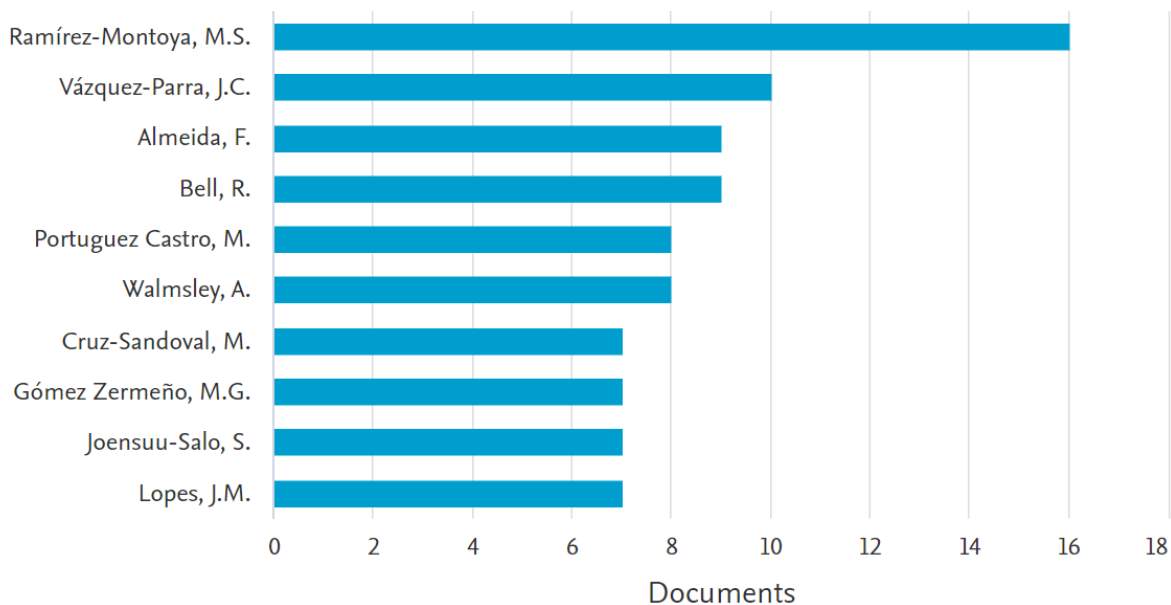


Figure 4. Top 10 authors in the world in entrepreneurial innovation in higher education

Regarding notable writers in the area of creative entrepreneurship in higher education, the following academics have made substantial contributions to the discipline;

Ramírez-Montoya, M. S. (2019) The current trends in virtual education have taken an exciting turn regarding how the educational offer is presented and show the need to offer virtual pedagogical models that combine different components of the teaching-learning process. A thorough grasp of creative approaches in higher education entrepreneurship is demonstrated by Ramírez-Montoya's large body of work, which is represented in 16 documents. It's possible that his research will provide insightful information about encouraging entrepreneurial endeavours on campuses.

Vazquez-Parra seems to have made a significant contribution to the discussion of entrepreneurship in higher education with her focus on ten documents. His writings could

provide insight into practical tactics, guidelines, or case studies that encourage creativity in educational environments. Vazquez-Parra notice about practices in social entrepreneurship (Vazquez-Parra et al, 2021) The training in social entrepreneurship competency requires a strategy linked to commitment, change and creation

The nine documents that Almeida has gathered point to a significant amount of research into the relationship between entrepreneurship and higher education. Understanding how academic institutions can promote innovation and entrepreneurial thinking may benefit greatly from his research. Fernando Almeida focused on ways of teaching entrepreneurship, (Almeida, 2017) the use of serious games in the entrepreneurship field is a way of encouraging students' motivation to become entrepreneurs and develop their skills in the field.

Bell's contribution of nine documents demonstrates his dedication to expanding knowledge about entrepreneurship in the context of higher education. His study could offer insightful viewpoints on the obstacles and possibilities that academic entrepreneurs must overcome. As a solution; Bell R propose (Bell, R et al, 2020) during the experience stage of the learning process, learners can start with concrete experiences before moving on to reflection or they can start with active experimentation to explore their different/innovative "break free ideas" and then move to other concrete experiences based on this active experimentation towards the end of the experience stage.

The eight publications by Portuguez Castro show a concentrated interest on cutting-edge methods of entrepreneurship in higher education. It's possible that his work offers distinctive viewpoints that will be advantageous to academics and industry professionals alike. Portuguez Castro mentioned also the impact of costs on entrepreneurial activities, (Portuguez Castro May et al, 2020) The risks occasioned by the crises were related to increasing costs, institutional barriers and the effects of the damaged economies on consumers, the planned capital investments that could not go forward, the emotional losses that stress causes, feelings of vulnerability and uncertainty and the loss of personal property.

Researching entrepreneurship in higher education appears to have been a recurring focus of Walmsley's eight documents. His research could provide light on emerging trends, best practices, and areas where university entrepreneurial ecosystems could use some enhancement. Walmsley also cited the importance of educator's role (Walmsley, A. et al, 2022) Educators could also draw on the increasingly international body of students in higher education to explore different cultural scenarios and how these frame understandings of enterprise and entrepreneurship and what the implications of this are for bringing about political change.

Cruz-Sandoval seems to have made a substantial contribution to the literature on entrepreneurship in higher education, as seen by the seven papers they have to their name. Their work may focus on a variety of subjects, such as the effects of entrepreneurship on institutional development and educational strategies. Cruz mentioned conditions to success in entrepreneurial activities; (Cruz-Sandoval, M. et al, 2022) factors such as the possibility of financing, government support, accessibility to infrastructure, the nature of domestic markets, facilitative regulations, the entrepreneurial culture, and, of course, the support of related university programs are essential when it comes to entrepreneurship.

Gomez Zermeno has a significant interest in the study of innovative entrepreneurship in higher education, as evidenced by his seven documents. Her study could offer insightful viewpoints on how schooling shapes entrepreneurial mindsets.

The seven papers by Joensuu-salo show a concentrated investigation of entrepreneurship in higher education. Her research may advance knowledge of how educational institutions may support creativity and get students ready for start-up careers.

Lopes has made a substantial contribution to the conversation around entrepreneurship in higher education with his seven publications. He may conduct research on a variety of subjects, including as industrial collaborations, curriculum creation, and the general effects of entrepreneurial endeavors in educational environments.

The writings of these authors are indispensable reading for those interested in furthering the subject of entrepreneurship and higher education, as they collectively offer a wealth of insights into the complex junction of the two.

4. Conclusion

This article provides insight into how entrepreneurial innovation is changing in higher education through bibliometric analysis. Establishing a dynamic learning environment and shattering conventional limits, the incorporation of entrepreneurial ideas into academic institutions has become a transformational force. Entrepreneurial education is receiving more attention as it is realized that creativity, invention, and adaptability are just as important as academic proficiency in equipping students to face the difficulties of an uncertain future.

(Elina Varamäki, et al 2015) Indeed, one of the central objectives of entrepreneurship-related programs is to develop entrepreneurial potential, i.e. the degree to which an individual possesses entrepreneurial qualities

A bibliometric analysis was used as part of the research technique, with an emphasis on the evolution of publications, geographic distribution, publishing domains, and leading writers in the field. The goal of the examination of successful case studies and worldwide best practices was to reveal the significant benefits that students receive from developing an entrepreneurial mindset.

A surge in interest in creative entrepreneurship is indicated by the increase in publications on entrepreneurial innovation in higher education from 2019 to 2021. However, a little decrease in 2022 and 2023 calls for more research into plausible causes, such changes in scholarly priorities, governmental emphasis, or international economic conditions.

In terms of geography, the US leads the world in encouraging creative entrepreneurship in higher education, while China, the UK, Spain, Malaysia, Indonesia, Portugal, Russia, Mexico, and Germany have also made significant contributions. For the purpose of fostering innovation and the conversion of concepts into workable solutions, these countries stress the need of integrating academia, business, and the community.

The multidisciplinary nature of entrepreneurial endeavors is emphasized by the distribution of publications across multiple fields. The main fields in higher education that are propelling entrepreneurial innovation are the social sciences, business management, computer sciences, engineering, and economics. The arts and humanities' ranking in the top ten suggests a

comprehensive strategy that takes into account the creative and cultural elements of encouraging an entrepreneurial attitude.

Leading writers who have made substantial contributions to the field are identified using the bibliographic network analysis. Numerous scholars, including Ramírez-Montoya, Vazquez-Parra, Almeida, Bell, Portuguese Castro, Walmsley, Cruz-Sandoval, Gomez Zermeno, Joensuu-salo, and Lopes, have generated significant research that provides insights into various aspects of entrepreneurship in higher education.

Essentially, this bibliometric analysis highlights the increasing global trend of incorporating entrepreneurial innovation into higher education. In order to develop innovative and creative problem solvers and, eventually, the next generation of leaders and innovators, it highlights the necessity of ongoing research, teamwork, and strategic initiatives.

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