

**Research-in-progress**

**WHAT IS NEXT IN ENTREPRENEURIAL EDUCATION: BIBLIOMETRIC ANALYSIS  
ON BUILDING COMPETENCIES FOR THE ENTREPRENEURIAL WORLD**

**Aleksandra Janeska Iliev**

*Ss. Cyril and Methodius University in Skopje, Faculty of Economics-Skopje*  
[aleksandra.janeska-iliev@eccf.ukim.edu.mk](mailto:aleksandra.janeska-iliev@eccf.ukim.edu.mk)

**Stojan Debarliev**

*Ss. Cyril and Methodius University in Skopje, Faculty of Economics-Skopje*  
[Stojan.Debarliev@eccf.ukim.edu.mk](mailto:Stojan.Debarliev@eccf.ukim.edu.mk)

**Violeta Cvetkoska**

*Ss. Cyril and Methodius University in Skopje, Faculty of Economics-Skopje*  
[Violeta.Cvetkoska@eccf.ukim.edu.mk](mailto:Violeta.Cvetkoska@eccf.ukim.edu.mk)

**ABSTRACT**

*In this study, we aim to present the first bibliometric analysis of entrepreneurial education research focusing on entrepreneurial competencies for the timeline 1998–2022, using the PRISMA protocol for conducting systematic literature reviews. We analyze 104 publications (articles, proceedings papers, and book chapters) in the citation topic Meso, Management search in Web of Science. In descriptive analytics, we present our findings on the distribution of articles by year, an artificial intelligence-driven visual (a "decomposition tree") for the citation distribution based on publisher and source title, and the top five most cited publications and top cited authors. However, the main focus of this study is identifying the research hotspots in the whole analyzed period and the last five years (2018–2022) by mining the abstracts with the use of the VOSviewer software. We present network visualization maps for the two specified periods with detailed explanations for each cluster keyword. The initial results suggest an implicative overall clustering around three main fields: personal traits and entrepreneurial intentions; practical skills and experiences; academy and society. Still, results for the last five years are presenting specializations in four segments: courses training and mindset; experience capacity and intention; knowledge, skills, and values; regional integration, policy, and technology. Based on our practical implications suggested, higher education management is offered options for taking further action for curriculum development, as well as relevant future research directions that can assist researchers in designing their research in this crucially important research field for each region worldwide.*

**Key words:** *bibliometric analysis, entrepreneurial education, entrepreneurial competences, entrepreneurial skills, descriptive analytics, AI visualization, text mining*

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## 1. INTRODUCTION

The reasons behind the affirmative role of entrepreneurship have been greatly engaging academia, business, and education, always seeking formulas for encouraging the development of new entrepreneurial potential. Research and education across the world have been attempting to answer the question of why some people choose to establish a new venture while others choose not to. Entrepreneurship has been a field of growing interest so education and especially universities have made it their priority to engage in building solid bases for the development of new types of curricula oriented strongly towards entrepreneurial competencies and entrepreneurial education. Entrepreneurship research emerged in the 1980s as a potentially promising field of study, and by the end of the 1990s, the area of research had gathered momentum. (Bygrave, Hofer, 1991) Entrepreneurship has become a priority for universities as it promotes the generation of successful entrepreneurs and increases brand, status, and revenues (Cantu-Ortiz et al., 2017). The first course in Entrepreneurship was delivered in 1947 at Harvard Business School and ever since entrepreneurship education (EE) curricula in higher education has grown globally extensively.

Entrepreneurial education has the goal of developing some level of entrepreneurial competencies. (Lackéus ,Middleton, 2015).Entrepreneurial competencies are defined as knowledge, skills, and attitudes that affect the willingness and ability to perform the entrepreneurial job of new value creation. (Sánchez,2011). Education has been discussed in line with the competencies, and intention mindset it is even suggested that an entrepreneurial mindset could be taught or learned (Marting et al.2013). The initial perceptions identified very early that competencies are preconditions for supporting business success (Bird, 1995). Entrepreneurial competency can also be associated with several sub-competences, including adventure, communication, creativity, decision-making, initiative-taking, innovation, interpersonal, leadership, proposal-making, motivation, problem-solving, risk propensity, self-control, and strategic thinking. (Pittaway, Cope 2007).

On many occasions, entrepreneurial activities in the country are determined by the level of knowledge related to entrepreneurship (Decker et al. 2014). So, it is often suggested that specific entrepreneurial competencies could be in relationship with the overall business development, and this is in line with the discussion about the founder's characteristics. Hence, the traits of entrepreneurs their characters on how they build their entrepreneurial potential, entrepreneurial intentions, the entrepreneurial event, self -efficacy are only a few of all the terms used to find the right ingredients for “creating entrepreneurs”.

Initially one of the papers motivating our work is offering systematic review of empirical evidence using the teaching model framework. This manuscript has focused on papers published in the period between 2004-2016 focusing on the influence of entrepreneurship education (EE) in higher education on a range of entrepreneurial outcomes (Nabi et al. 2017) Hence the work of Nabi et al,2017 suggest three areas of concern. The dominant focus on short-term,so subjective impact measures such as entrepreneurial attitudes and intentions rather than longer-term ones like venture creation behavior and business performance, so future research to address this gap. (Nabi et al. 2017;Pittaway, Cope, 2007) The second conclusion is referring to EE programs having both positive and negative implications, attitudes and behaviors , hence there are contradictory findings, stating the third gap focused on the few reviews focusing on EE in higher education. (Nabi et al. 2017); Previously Pittaway and Cope covering mainly papers before the year 2006 aimed at preparing a systematic literature review concerning entrepreneurship education and the impact student propensity and intentionality (Pittaway, Cope,2007). We have

not been able to find a bibliometric analytical approach in concerning the topic of Entrepreneurial education. Hence the methodological novelty enables us to attain new findings considering an extensive amount of literature at once. The main aim of our research is at synthesizing the fast-growing body of empirical research and reviews in the field of entrepreneurial education coped strongly to entrepreneurial skills and competences. The purpose of this paper is to explore different themes within entrepreneurship education, entrepreneurial competencies, and skills via the use of bibliometric analysis and suggest causality based on this research. Hence based on all this we have proposed the following research questions;

RQ1: What are the bibliometric trends in EE research?

RQ1: What are the main clusters and topics in EE research agenda?

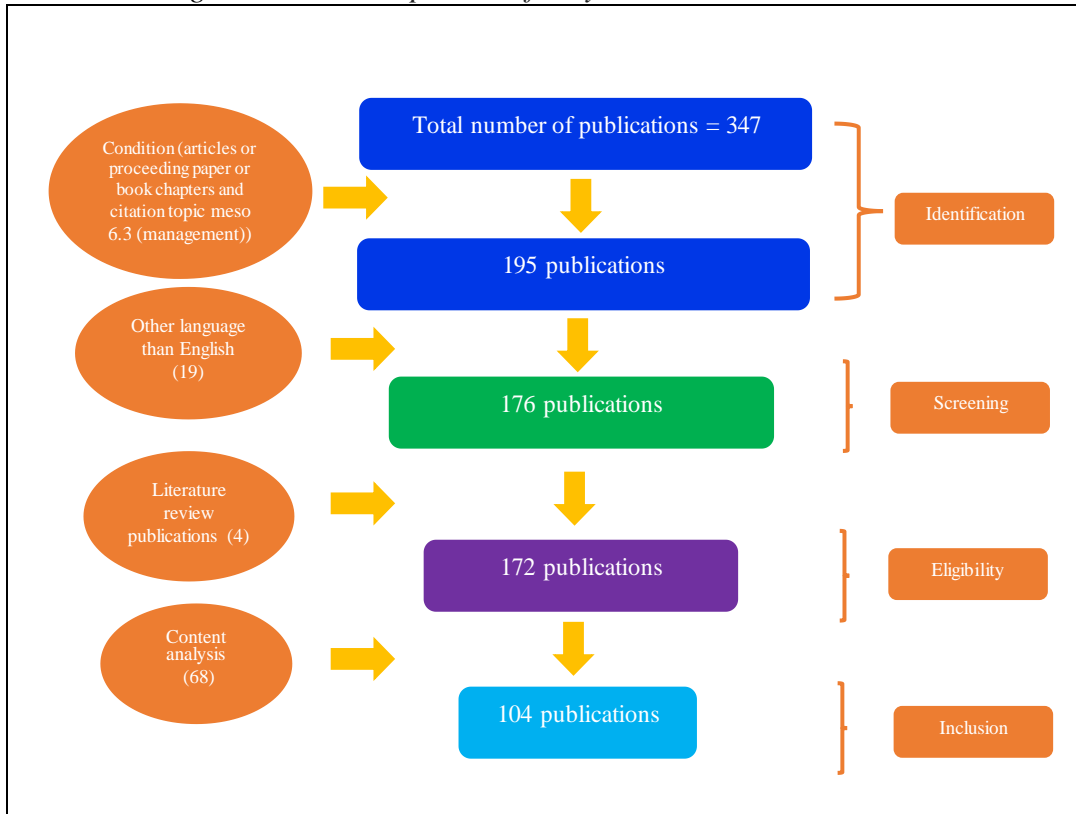
RQ1: What are the independent variables greatly cited considering EE?

These three questions offer a new and broad picture of the research area, indicative relationship which could be further pursued related to Entrepreneurial education, at the same time implicating potential gaps for further research Following the PRISMA protocol the initially suggested 347 papers turned into 104 papers as part of the final analysis. The initial results from the data mining suggest an overall clustering around three main fields: personal traits and entrepreneurial intentions; practical skills and experiences; academy and society. Still, results for the last five years are presenting specializations in four segments: courses training and mindset; experience capacity and intention; knowledge, skills, and values; regional integration, policy, and technology. Based on our practical implications suggested, higher education management can be offered options for taking further action for curriculum development, as well as relevant future research directions that can assist researchers in designing their research in this crucially important research field for each region worldwide.

## 2. METHODOLOGY AND DATA

We follow the four PRISMA protocol phases (identification, screening, eligibility, and inclusion) for systematic literature review according to Moher et al. (2009). In the *identification phase* in the Web of Science database, we searched the terms "entrepreneurial education," "entrepreneurial competence," and "entrepreneurial skills" in the topic and found 347 results in the period from the first study to the end of 2022. Then we selected three types of publications: articles, proceeding papers, and book chapters. The citation topic meso is 6.3, i.e., management, and our sample consists of 195 publications in the three above-mentioned types. In the *screening phase*, we excluded 19 articles that are in languages other than English, while duplicates were not found. To avoid the problem of results repetition, we excluded other systematic literature reviews that were 4 during the *eligibility phase*. In the final *phase of inclusion*, we conducted content analysis on the remaining 172 publications, ensuring that only abstracts related to the searched terms will be included in the bibliometric analysis. By carefully reading the 172 abstracts, we have found 68 inadequate for our analysis, for example, the ones that just mentioned the searched terms while the research was on another topic. Based on the PRISMA protocol phases our final consists of a sample of 104 publications (Figure 1).

Figure 1: PRISMA protocol for systematic literature review



Source: Own research

We have created visuals in Excel to present the distribution of publications by publication type, the distribution of articles by year, the top source title, the five most cited publications, and the top cited authors in this area. Furthermore, we use an artificial intelligence-driven visual in Power BI, the decomposition tree, to present the distribution of citations by the publisher and source title.

To answer the set objectives in this paper regarding the research hotspots in the whole analyzed period and the last five years, we have mined the abstracts by using the VOSviewer version 1.6.18, which is leading in conducting scientific bibliometric analysis, and we have created two network visualization maps.

In creating those maps, we have ignored structured abstract labels and copyright statements. The counting method is binary. The minimum number of occurrences of a keyword for the whole observed period is set to 5, while for the last 2 years, it is set to 2 because new keywords may occur in the last 2 years and they may not show up as much as in the whole period. A relevance score is calculated for each extracted keyword, and 60% most relevant keywords are chosen by default. Then we verified each keyword and excluded those that are not relevant for the analysis (for example insight, researcher, basis, definition, etc.)<sup>1</sup> The network visualization map for the whole analyzed period is created with 81 keywords grouped in 4 clusters, while for the last 5 years, the map consists of 140 keywords grouped in 8 clusters.

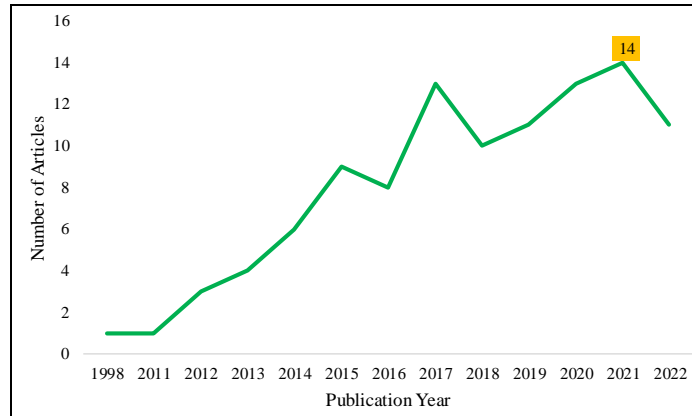
<sup>1</sup> The excluded terms will be given in an appendix to the paper.

### 3. RESULTS

#### Descriptive Analytics Results

The whole sample has included a total of 105 papers of which 67 are journal articles, 34 conference papers, and 3 book chapters. In our analysis, 56.7% of the publications were published in the last five years (2018-2022)(Figure -2) which confirms the relevance of the sample and the potential to discuss emerging topics.

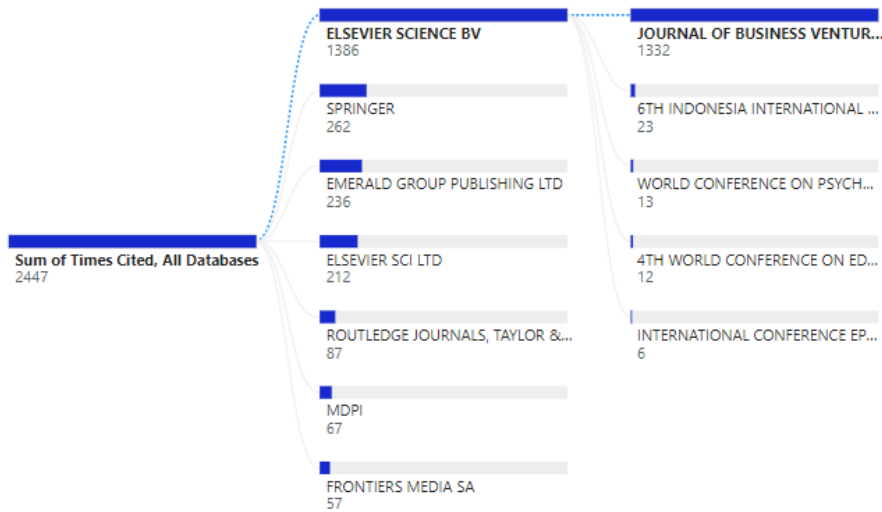
Figure 2: Publications by Year



Source: Own research

Top publisher and source title based on citation have been the Journal of Business Venturing which has been mostly cited as well as Elsevier Science BV (Figure 3) As presented in Figure 4 the five most cited paper are presented , whereas top three are Chen et al.,1998, do Paço, et al.2011, Solesvik,2013

Figure 3: Top five journals based on the number of published article



Source: Own research

Figure 4: Top 5 most cited articles

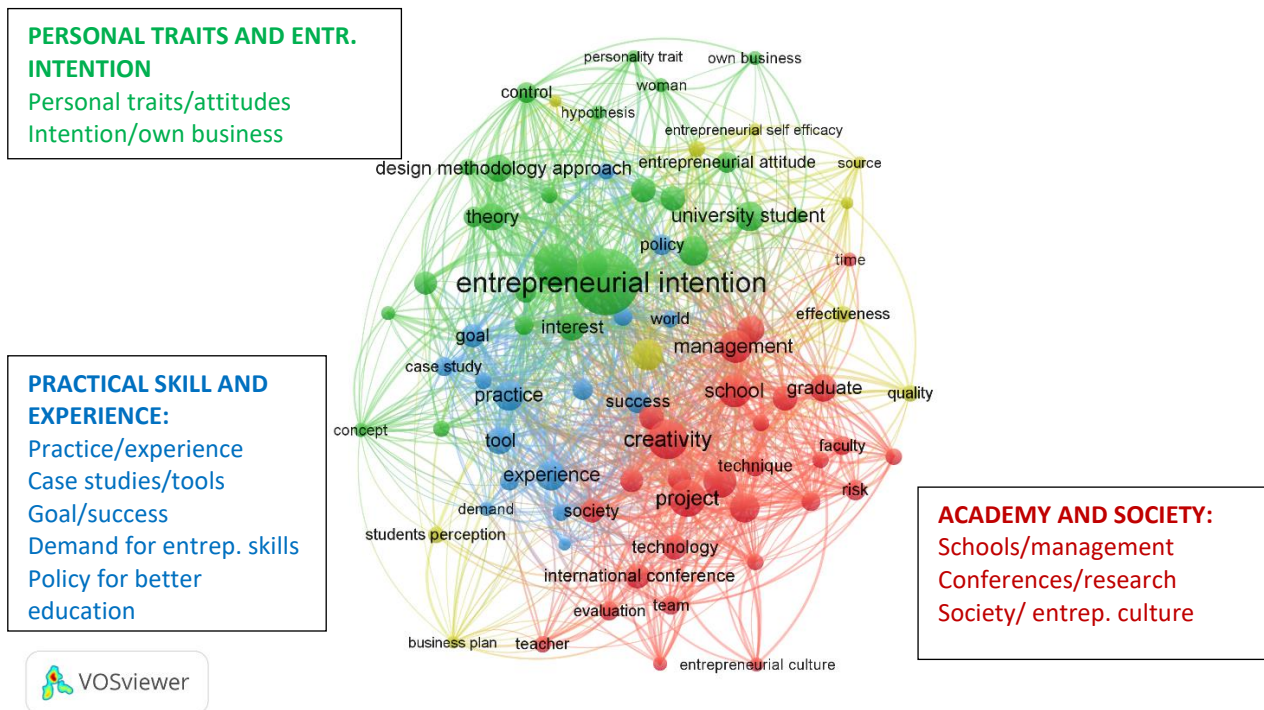
Authors	Citations
<b>Total Citation (all authors)</b>	<b>2447</b>
Chen, CC; Greene, PG; Crick, A	1332
do Paco, AMF; Ferreira, JM; Raposo, M; Rodrigues, RG; Dinis, A	130
Solesvik, MZ	107
Donnellon, A; Ollila, S; Williams, MK	99
Edwards-Schachter, M; Garcia-Granero, A; Sanchez-Barrioluengo,	97

Source: Own research

### Text mining results for the identification of research hotspots

We have prepared a visualization map by using the bibliographic data which over the entire period implies three overall hotspots. The first is personal traits and entrepreneurial intentions, considering the individual personal trait aspects of the entrepreneur, the intention to start/own a business, and gender differences. The second one is more related to skills which entail the experiences/ practices, case studies, goals, demand for entrepreneurial skills, and policy for better education. The third is evolving around academy and society which is focusing the educational system itself namely schools, research, and society.

Figure 5: Research hotspots over the entire time period examined



Source: Own research



implications for entrepreneurial education and research directions for interested researchers in this challenging field.

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