

Entrepreneurship education and training as facilitators of regional development

A systematic literature review

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Abstract

Purpose – The purpose of this paper is to provide insights of a systematic literature review (SLR) of the entrepreneurship education and training as facilitators of regional development. Current and future trends in the field are identified.

Design/methodology/approach – The paper offers an SLR on the entrepreneurship education and training and advances through a comprehensive bibliometric analysis comprising the period 1973-2016. To collect data, only articles published in scientific journals were used in the SCOPUS database.

Findings – The results highlight that both training and entrepreneurship education can be a strong strategic tool for regional development, and that it is important for entities such as academia, government and business to cooperate towards the same goal in order to strengthen the entrepreneurial intention of society. Findings reveal three clusters as trends of literature: entrepreneurial universities, entrepreneurial spirit and process of business creation.

Originality/value – This paper contributes to fill the gap in terms of SLR on the importance of entrepreneurship education and training for regional development conducted by a bibliometric analysis.

Keywords Entrepreneurship, Regional development, Bibliometric analysis, Systematic literature review, Education and training, Entrepreneurial universities

Paper type Research paper

1. Introduction

The current worldwide conjunction of economic trends has created serious difficulties, especially in employment. Researchers have observed intense competition and elevated levels of change in economic, social and technological dimensions, which means that those who are seeking jobs are increasingly compelled to demonstrate a grasp of relevant information and knowledge (Laukkanen, 2000). In recent years, some authors have also reported that entrepreneurship boosts employment and drives economic development (e.g. Laukkanen, 2000; Matlay and Mitra, 2002; Tödtling and Trippel 2005; Song and Winkler, 2014), as well as being a key component in local and globalised market economies (e.g. Díaz-García *et al.*, 2015).

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In this context, training and education for entrepreneurship are seen as facilitators of economic development (Lindh and Thorgren, 2016) and a way to develop the abilities and entrepreneurial skills of individuals (Farashah, 2013). Given this assessment, education and training for entrepreneurship have moved to the top of political agendas and have become a priority around the world, independent of individual countries' phase of economic development (Mitra and Matlay, 2004). In 2013, the European Commission created the "Entrepreneurship 2020 Action Plan", which comprises initiatives that promote entrepreneurship in Europe, including education and practical training in entrepreneurship in the pertinent school programmes. Therefore, education and training for entrepreneurship are seen as strategic tools contributing to increased employment and to the growth and economic development of regions.

Despite several studies (Katz, 2003; Harrington and Maysami, 2015; Lindh and Thorgren, 2016) that refer to entrepreneurship education as fundamental to economic and regional development, the literature still shows a gap in terms of systematic literature reviews (SLRs) of research on the importance of education and training for entrepreneurship to regional development. Due to the lack of bibliometric analyses of research in this field, the present study is pertinent to further research on this topic because it sought to identify current and future tendencies in the literature on the contribution of entrepreneurship education and training to regional development.

In order to conduct this SLR more efficiently, the SCOPUS database was chosen because it was the most comprehensive and it produced more results for this topic than the Web of Science database did. The keywords selected to find the articles used in this study were "entrepreneur*", "region*", "develop*" and "education or training", which produced a total of 635 documents. However, after excluding conferences papers, reviews, books, book chapters and journal articles that were repeated or that did not directly deal with the subject in question, only 383 articles served as the basis for the SLR described below.

The next section briefly discusses the theoretical framework, focusing, in particular, on the significant role of entrepreneurship in economic growth and the importance of entrepreneurship education and training to regional development. In Section 3, the methodology is described so that other researchers can duplicate the SLR as needed. In Section 4, the results are analysed, and the current state of the art is discussed based on the publications reviewed in this study. The last section presents conclusions, implications and limitations and suggests future lines of inquiry.

2. Literature review

2.1 *Role of entrepreneurship in economic development*

Entrepreneurship has never been more important than it is today. The financial crisis that many countries are experiencing has meant that entrepreneurship is now seen as a strategic alternative in the fight to reverse this downward turn in economic cycles. Entrepreneurship is thus seen as a driver of growth and economic (e.g. Laukkanen, 2000; Matlay and Mitra, 2002; Tödtling and Trippel, 2005; Song and Winkler, 2014) and social development (Jack and Anderson, 2002), bringing innovation and sustainability to regions. Sánchez (2013) reports that the higher the level of entrepreneurship is in a country, the greater its level of economic growth, development and innovation.

According to Henderson (2002), countries with greater entrepreneurial activity tend to experience greater growth in their gross domestic product. The cited author notes that one-third of the difference in this growth between countries can be explained by entrepreneurship.

Entrepreneurship has an important role in societies, leading to increased economic efficiency, creation of new jobs and innovation transmitted to the market (Shane and Venkataraman, 2000). The European Commission (2003), in its "Green Paper on Entrepreneurship", points out that innovative ideas transformed into successful entrepreneurship initiatives can make the most

disadvantaged people realise their potential. This leads them to create their own jobs and find a better place in society. Entrepreneurship is thus associated with innovation and job and wealth creation.

Baron and Shane (2007) argue that a relationship exists between entrepreneurship and economic development. The cited study showed that, just in the USA alone, more than 600,000 new businesses are started every year and that number is double what it was a few decades ago. Baron and Shane (2007) found that large firms in the USA have eliminated more than six million jobs, yet the unemployment rate has fallen to lower levels due to new entrepreneurial ventures. The cited authors report that, in the USA, more than ten million people are self-employed, corresponding to approximately one in eight people.

According to chapter 6 of the European Commission's (2012) "Education and Training Strategy", entrepreneurship is one of the basic skills that individuals need to succeed in a highly competitive and innovative society. According to Tajani (2013), who is the Vice President of the European Commission, some people are born with an entrepreneurial spirit, but, in most cases, it is necessary to learn to be an entrepreneur. For example, 15 to 20 per cent of students who participate in a business start-up project in secondary education eventually create their own business.

2.2 Education and training for entrepreneurship

Entrepreneurship education originated in 1947 at the Harvard Business School in a course developed by Myles Mace. This Management of New Enterprises course was attended by a total of 600 students of the second year of the Master in Administration programme (Katz, 2003). Later, Peter F. Drucker (1953) included the concept of innovation in entrepreneurship education, which thus led to the Entrepreneurship and Innovation course at New York University (Katz, 2003).

Although almost 70 years have passed since these courses were first offered, entrepreneurship as an academic subject is still in an early phase of development (Finkle *et al.*, 2009) since there is, as yet, no standard structure or consensus on best practices for entrepreneurial business education (Fiet, 2000a, b; Brockhaus *et al.*, 2001; Solomon, 2007). Authors still disagree about how to teach students to become entrepreneurs (Sexton and Upton, 1987; Hynes, 1996; Adcroft *et al.*, 2004; Matlay and Carey, 2007; Fayolle, 2013; Abou-Warda, 2016). However, a respectable number of studies have found empirically robust proof that students can acquire entrepreneurial skills (e.g. Anselm, 1993; Gorman *et al.*, 1997; Katz, 2003). With respect to developing an ontological perspective, various studies have addressed different meanings and definitions of entrepreneurship education that, in turn, lead to different approaches to teaching.

According to Kourilsky (1995), entrepreneurship education improves skills in the area of selection of opportunities, organisation of resources to deal with risks and development of businesses. Jones and English (2004) add that entrepreneurship education is a process that gives individuals the competence to recognise business opportunities, stimulating these entrepreneurs' self-esteem, introspection, knowledge and ability to act on these strengthens. Fayolle *et al.* (2006), however, define entrepreneurship education in a more comprehensive way, including in this category any educational programme or educational process that develops entrepreneurial attitudes and skills.

Heinonen and Poikkijoki (2006) suggest that three types of objectives need to be met by education and training programmes for entrepreneurship: teaching students to understand entrepreneurship, act in entrepreneurial ways and become entrepreneurs.

Many studies have addressed how entrepreneurship should be taught (Doboli *et al.*, 2010; Wang and Chen, 2013; Carvalho *et al.*, 2015). An analysis of these articles revealed that entrepreneurial education and training need to include negotiation skills, leadership, new product development, creativity, innovation (McMullan and Long, 1987; Vesper and McMullen, 1988)

and identification of opportunities (Long and McMullan, 1984; Shane and Venkataraman, 2000; Hindle, 2004). Matlay (2011) and Taylor and Thorpe (2004) also state that students must understand the role of networks, customers and other stakeholders.

According to Solomon (2007), most methods used to teach entrepreneurship involve lectures, the creation of business plans, classroom discussions of case studies and studies of plans' economic viability. Gibb (2002) and Sogunro (2004) argue that lectures as a teaching method are less effective than teaching business principles, that is, learning by doing, which many authors consider to be the best pedagogical method (Gorman *et al.*, 1997; Fiet, 2000a, b).

These programmes should begin in elementary schools, thus cultivating entrepreneurial characteristics in students from an early age. Programmes include the Junior Achievement Program, which began in the USA but which is now available worldwide.

In recent years, a number of entrepreneurship education and training programmes for older students have appeared, such as incentive and funding programmes, entrepreneurship experiences, business visit programmes and theoretical and practical courses (Gorman *et al.*, 1997; Solomon *et al.*, 2002). This rapid increase in education and training programmes for entrepreneurship is due to the strong interest of governments and universities in increasing entrepreneurial intent. However, this popularity does not guarantee that these programmes are effective, so more studies need to measure the impacts of these programmes (Matlay, 2005; Farashah, 2013).

According to Lee and Peterson (2000), entrepreneurship education and training programmes usually differ from country to country due to varied economic, social and political contexts, but a lack of methodological rigour and quality has also significantly contributed to these differences (Farashah, 2013). Nabi and Holden (2008) thus call for studies that analyse entrepreneurship education and training programmes, including regional and international variations, in order to improve these programmes. Some authors note that, while an extensive literature exists on entrepreneurship education, in general, more research is needed to evaluate how entrepreneurship programmes influence entrepreneurial activities and attitudes (Béchar and Grégoire, 2005; Farashah, 2013).

Many researchers (Chen *et al.*, 1998; Wilson *et al.*, 2007; Abou-Warda, 2016) argue that people who attend entrepreneurship courses have stronger entrepreneurial intent or, at least, a stronger belief in their ability to accomplish entrepreneurial tasks. Studies have found that entrepreneurship education and training encompasses not only knowledge about ways to start a business but also processes that help to develop entrepreneurial skills and attitudes (Fayolle and Klandt, 2006).

As mentioned previously, the European Commission developed the "Entrepreneurship 2020 Action Plan" in 2013 to promote entrepreneurship in Europe, including teaching and practicing entrepreneurship from the kindergarten to university levels. This plan focuses on promoting entrepreneurship education as a way to develop an entrepreneurial culture leading to further economic development.

2.3 Entrepreneurship education and regional development

Some scholars argue that the implementation of education and training for entrepreneurship should vary according to the degree of regional development (Li and Matlay, 2005; Lindh and Thorgren, 2016). In other words, less developed regions need to focus on entrepreneurship education to ensure self-employment, while more developed regions should focus on academic studies (Dodd and Hynes, 2012). According to Asheim *et al.* (2011), regions are the key to innovation and economic development so that areas with a strong entrepreneurial culture, over the years, can experience economic growth (Audretsch and Fritsch, 2002; Audretsch and Keilbach, 2004).

Pike *et al.* (2006) emphasise that decentralising economic development and focusing on the local and regional levels help accentuate countries' development and economic growth.

Other authors report that regions play a key role in improving entrepreneurship and innovation due to localised learning processes (Lindh and Thorgren, 2016). As a result, policies of economic growth have been implemented that seek to improve local and regional education and creation of knowledge (Carlsson *et al.*, 2009; Tödting and Tripl, 2005; McDonald *et al.*, 2006; Asheim *et al.*, 2011).

Different levels of entrepreneurial activity may also be associated with different contextual factors and cultural aspects (Hopp and Stephan, 2012). In this context, culture refers to the values, beliefs and behaviours that are common among people living in a particular region (Hofstede, 1980; Hayton and Cacciotti, 2013). Some authors argue that culture can influence business activities (Shane, 1993; Moriano *et al.*, 2012) through attitudes, norms and perceived behavioural control (Liñán and Chen, 2009).

A quite extensive number of studies associate entrepreneurship with the economic development of regions or countries. However, entrepreneurship facilitates local growth in employment, income and tax revenues and improves service delivery, thereby only indirectly contributing to local and national development (Hisrich and Cabrera, 2012).

In recent years, entrepreneurship has, nonetheless, gained a well-established reputation as one of the most powerful economic forces (Kuratko, 2005) and engines of development around the world. According to Kelley *et al.* (2015) reports, entrepreneurship has a positive impact on the economic development of regions and countries as the creation of new enterprises leads to local investment and, thus, to new jobs and the promotion of competitiveness and economic development.

Some organisations, including the European Union, the World Bank and the Organisation for Economic Co-operation and Development (OECD), have made strategic recommendations that emphasise the development of an enterprising spirit and entrepreneurial skills. According to the European Union's "Entrepreneurship Action Plan 2020" (European Commission, 2013), European governments that invest in entrepreneurship education have experienced some of the largest returns on investment in Europe. It is, therefore, vital to include entrepreneurship education in school programmes. In this way, universities and higher education systems have a fundamental role in developing innovative ecosystems to disseminate entrepreneurial behaviours and attitudes among the available human capital (Secundo *et al.*, 2015).

In addition, universities have participated in research on entrepreneurship and entrepreneurship education (Solomon *et al.*, 2002; Katz, 2003; Finkle *et al.*, 2009), which has also contributed to regional development. Etzkowitz *et al.* (2000) found that most universities have changed their strategic behaviour and begun to explore opportunities, calling themselves "entrepreneurial universities". This academic revolution has incorporated a third mission so that, in addition to teaching and researching, universities also seek to contribute to regional development by generating knowledge and innovation.

Several studies have analysed the role of universities in the promotion of entrepreneurship. Some of these studies have examined this phenomenon at a micro level, such as institutional strategies and performance in technology transfer (Di Gregorio and Shane, 2003; Clarysse *et al.*, 2005). Other researchers have analysed this trend at a macro level, such as the impact of universities on the surrounding business fabric (Baptista *et al.*, 2011). According to Audretsch *et al.* (2005), new companies with a broader knowledge base tend to be located near universities since the latter generate a constant flow of knowledge and new ideas that is responsible for the creation of a greater technological capacity (Mazzoneli and Nelson, 2007). In this way, universities play a strategic, fundamental role in the contribution of new companies to regional systems (Bergmann *et al.*, 2016).

According to Dodgson and Staggs (2012), universities have followed an increasingly commercial strategy when building relationships with industries and governments as a way to contribute to innovation. The relationship between these three entities (i.e. universities,

industries and governments) is explained by Etzkowitz and Leydesdorff (1997) by a triple helix network model. This model includes the relationships between the three entities and the ways they influence innovation in regions (Nelson, 1993; Etzkowitz, 1995). The triple helix model thus demonstrates how universities (i.e. knowledge generators), companies (i.e. generators of goods and services) and governments (i.e. regulators and promoters of economic activities) interact with each other in order to generate new knowledge, technological innovation and economic development (Etzkowitz and Leydesdorff, 2000).

3. Methodology

The present study consisted of an SLR of research on education and training for entrepreneurship and their influence on regional development, seeking thereby to identify the trends and growth of knowledge in this area. The review also sought to measure the impact of publications on this topic, identify the journals that publish more of these articles and ascertain more productive authors and institutions, as well as identifying neglected themes and methodologies.

Pittaway and Cope (2007) consider SLRs an appropriate method for examining research on entrepreneurship. This method is especially useful when dealing with numerous articles distributed over a long period of time. In addition, the basic principles of SLRs provide adequate transparency and replicability as a research method (Tranfield *et al.*, 2003; Armitage and Keeble-Allen, 2008).

To conduct the present SLR more efficiently, the Scopus database was chosen, and the search limited to publications from 1973 to 2016 that contain the keywords “entrepreneur*”, “develop*”, “region*” and “education or training” (i.e. in titles, keywords and abstracts). In order to arrive at the required number of documents, only articles with empirically validated knowledge were included (Podsakoff *et al.*, 2005), thus excluding articles from conferences, reviews, books and book chapters.

The main reason for choosing the Scopus database was its wide coverage of internationally indexed scientific journals of a quality recognised by the academic community, although some of the articles identified were also available in the Web of Science. The search of this database resulted in 383 publications. Table I shows a summary of the phases in the SLR process.

When processing some of the data obtained, the analysis options provided by Scopus, VOSviewer and Nvivo platform were used. These facilitated analyses of the results presented in the next section.

4. Results

4.1 Evolution of publications (1973-2016)

As can be seen in Figure 1, the number of publications on entrepreneurship, education and training for entrepreneurship and regional development began to increase significantly from 2008 onward, with a peak in 2015 of 47 articles published. However, from 1994 onward,

Phase	Description	Result
Phase 1	Choice of database: Scopus	–
Phase 2	Search of database with the four keywords: “entrepreneur*”, “develop*”, “region*” and “education or training”	634 publications
Phase 3	Selection of only scientific publications, excluding conference articles, reviews, books and book chapters	383 publications
Phase 4	Analysis of 383 publications from 1973 to 2016	383 publications

Table I.
SLR process stages

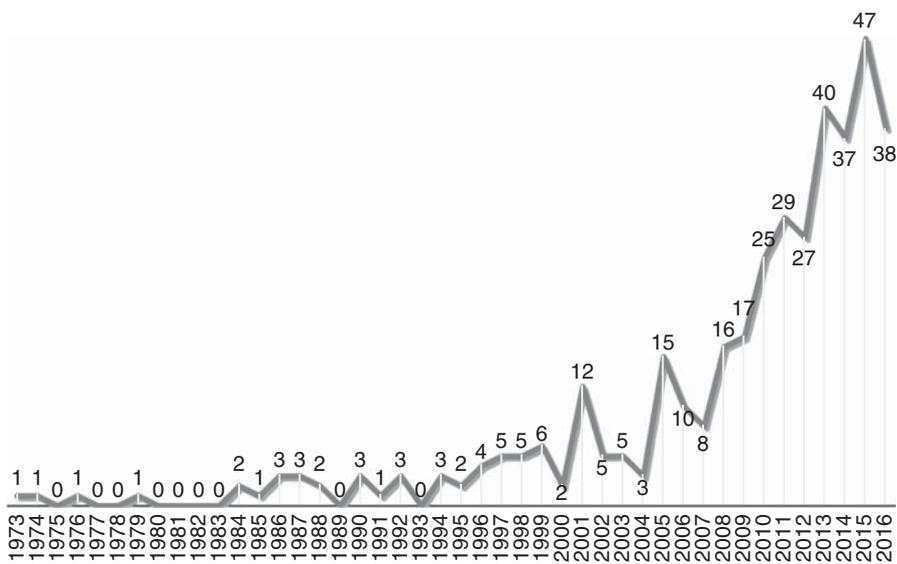


Figure 1.
Number
of publications
per year

this topic started to show a consistent level of publications since, before that, some years had no publications, for a total of only 22 publications in 21 years (i.e. 1973-1993).

The first and second articles in 1973 and 1974, respectively, dealt only with the importance of human resources and their qualifications in the development of regions. The first article was focused on local companies and the second on the health sector.

The theme of entrepreneurship began to be referred to directly in 1976 by Abegbola (1976) when he discussed the role of emigrants who return to Nigeria as a factor in regional development. The cited author concluded that returnees are more likely to become entrepreneurs than the population that never emigrated.

Figure 2 shows the ten countries that have contributed the most (61 per cent) to the existing literature in the Scopus database. The USA, with 71 publications, is the country that has published the most articles in recent years, followed for the UK with 48 publications and Spain with 26 publications. However, with regard to the ten most published countries, Europe is the continent that has most studied entrepreneurship education's role in regional development in recent years.

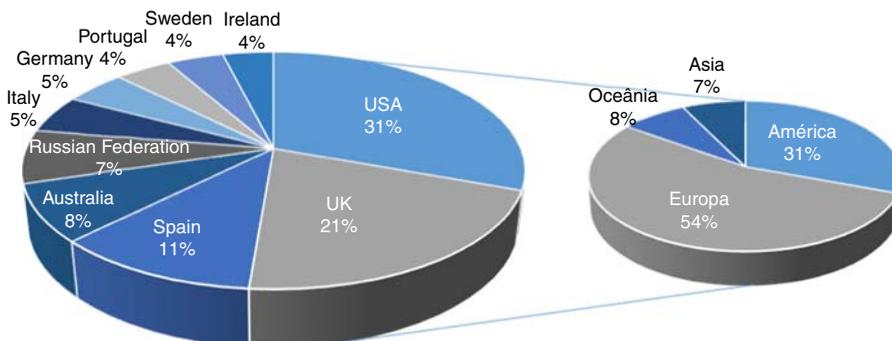


Figure 2.
Top ten countries
with the most
publications

4.2 Number of publications and most-used words

Table II shows the five journals in this database, out of 153 journals in total, that contributed the most with publications on this topic. Four of the five journals presented in Table II began publishing in the last decade on this topic and published the most articles in 2015 and 2016, which shows that the increased importance of this subject area is both recent and current.

In terms of topics, the analysis verified that management, business and accounting appear the most frequently in the five top journals. This could mean that, in addition to revealing these journals' strong interest in these subject areas, business and management can be seen as strategic tools in regional growth and development.

The Nvivo platform was used to analyse words in the 383 publications selected, focusing on their titles and abstracts. This analysis verified that the words "entrepreneurship", "university", "development", "education" and "entrepreneur" are extremely important and carry considerable weight in these publications (see Figure 3).

4.3 Most prolific authors

Regarding the authors of the 383 publications in this study's sample, the results show that 159 authors contributed to the development of research in this area. Table III contains the authors who published the most in recent years and the number of their citations. Although Urbano published the most articles (i.e. seven articles), Fritsch was the author who registers the highest number of citations, with an average of 59 citations per article.

With regard to citations by publication, in the last ten years, the number of citations has increased gradually (see Figure 4). This may be due to the larger number of publications that began to appear during this decade.

The h-index of the sample under analysis is 30, which means that 30 articles have at least 30 citations, which facilitates the identification of the most influential publications (Gundolf and Filser, 2013). The citations reflect the interconnections between authors and the conjunction between different scientific concepts in this subject area (Kraus *et al.*, 2014). Frequency of citations is an indicator of whether an article transmits important scientific knowledge that is then used as the basis for other research (Acedo and Casillas, 2005).

Journals	Number of publications	First publication (year)	Last Publication (year)	Number of citations	SJR	SNIP	Subject area and category
<i>Education and Training</i>	9	2007	2016	126	0.532	1.198	Business, management, accounting and education
<i>Journal of Small Business and Enterprise Development</i>	9	2004	2015	69	0.575	1.356	Business, management, accounting and strategy
<i>Asian Social Science</i>	8	2014	2015	11	0.187	0.789	Economics, econometrics and finance
<i>Journal of Business Venturing</i>	8	1990	2001	1,560	4.923	3.270	Business, management and accounting, international management and management of technology and innovation
<i>Journal of Technology Transfer</i>	8	2006	2016	102	1.518	1.406	Business, management, accounting and international management

Table II. Top five journals with the highest number of publications

Notes: SJR, scientific journal ranking; SNIP, source normalised impact per paper

Table IV.
Top ten co-cited
authors

Authors	Co-citations	Number of publications
Audretch, D.B.	140	72
Wight, M.	85	44
Etzkowitz, H.	82	37
Shane, S.	75	32
Fritch, M.	52	31
Urbano, D.	50	28
Lockett, A.	46	14
Matlay, H.	43	34
Florida, R.	41	23
Acs, Z.J.	40	34

Audretsch is a Professor and the Director of the Institute for Development Strategies at Indiana University's School of Public and Environmental Affairs. He is also the Co-founder and Co-editor of *Small Business Economics* and a Consultant to the United Nations, World Bank, OECD, European Commission and the US Department of State. His research focuses on the relationships between entrepreneurship, government policies, innovation, economic development and global competitiveness.

Wright is a Professor of Entrepreneurship at Imperial College Business School and the Director of the Centre for Management Buy-out Research. He has written more than 40 books and more than 300 articles in scholarly journals on acquisition administrators, venture capital, habitual entrepreneurs and academic entrepreneurs.

Etzkowitz, in turn, is a Professor at the University of Edinburgh Business School and the General Counsel of La Salle University's International Triple Helix Institute in Madrid. He has an international reputation in innovation studies as the creator of the concepts of enterprise university and the triple helix that binds universities to industries and governments at the national and regional levels.

4.4 Cluster analysis

Figure 5 shows the co-author network based on a minimum criterion of 20 co-citations per author, which reveals the existence of three clusters of the most prominent co-authors (i.e. 56 authors). Although these authors address different areas, they end up quoting each other fairly often, which shows a strong connection between them, as well as how the three clusters complement each other.

Figure 6 was created with a minimum criterion of 20 co-citations per journal, which revealed in which journals – out of 54 journals – co-authors published the most in recent years and which three clusters stand out the most. The *Journal of Business Venturing*, *Research Policy* and *Small Business Economics* are the three journals that published the most articles on research on this topic. Although these three journals appear in different clusters, a strong connection exists between them, which means that, like the co-author network (see Figure 5), the network of co-cited journals shows three clusters that complement each other and that are strongly interrelated.

In order to identify the aforementioned three clusters, the VOSviewer platform was used to process the co-citations of the 383 publications with a minimum of three co-citations per document in the Scopus database. In this way, the 67 most co-cited publications were selected to identify the following clusters (see Figure 7):

- (1) entrepreneurial universities (33 per cent);
- (2) entrepreneurial spirit (33 per cent); and
- (3) business creation process (31 per cent).

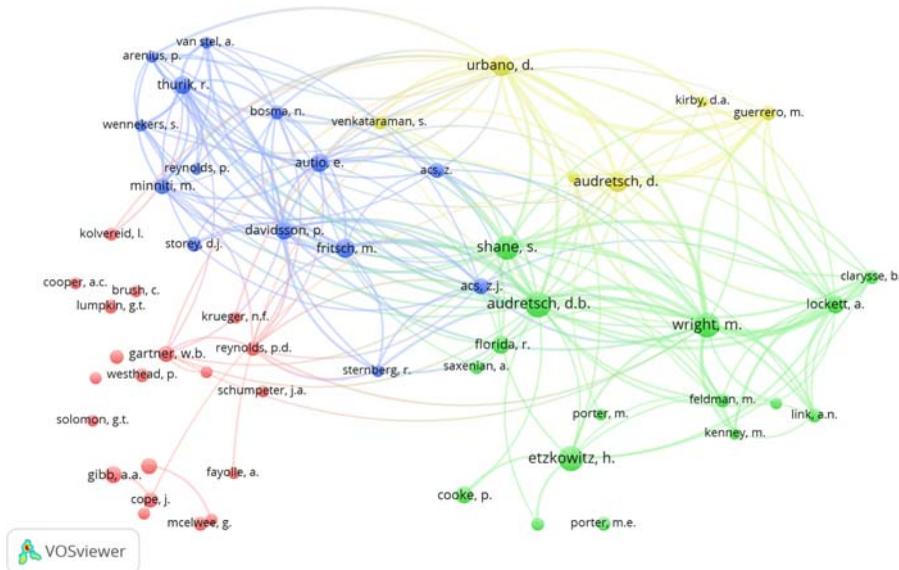


Figure 5.
Co-author networks

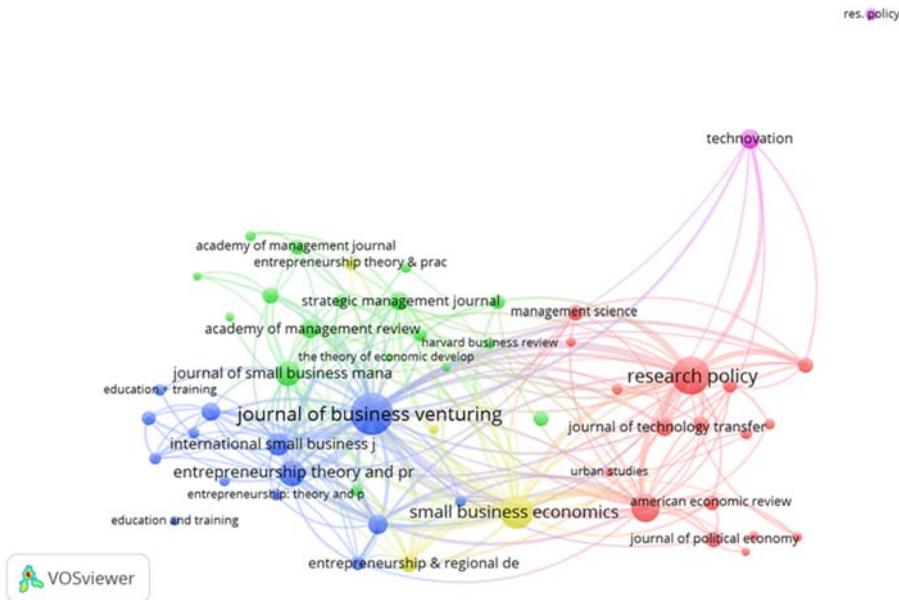


Figure 6.
Networks of
co-cited sources

The three clusters identified are balanced in terms of the number of articles published, since the entrepreneurial universities and entrepreneurial spirit clusters include 33 per cent of the publications, and the business creation process cluster has 31 per cent, respectively. As shown in Figure 7, the business creation process and entrepreneurial spirit clusters are complementary because studies of the business creation process must include the

entrepreneurial spirit. However, these two clusters also have a strong connection with the entrepreneurial universities cluster.

4.4.1 *Cluster 1: entrepreneurial universities.* The first cluster identified involves a set of studies on entrepreneurial universities. According to Etzkowitz and Leydesdorff (2000), universities now have other functions than teaching and research. Universities are also engaged in the transfer of technology and knowledge to companies (Debackere and Veugelers, 2005) and in the creation of spin-offs and start-ups (Astebro *et al.*, 2013; O’Shea *et al.*, 2007). These institutions are further promoting entrepreneurship education as a way of increasing the entrepreneurial intent not only of their students but also of the surrounding society.

Entrepreneurial university is a term used to define universities that offer opportunities, practices, cultures and environments conducive to actively encouraging and embracing student entrepreneurship. These institutions are places where entrepreneurship is part of the fabric of the academic community (Barnes *et al.*, 2002).

This cluster is composed of 22 publications that focus on the role of universities in society and economic development. As can be seen in Table V, four publications have more than three co-citations. Di Gregorio and Shane (2003) studied four factors – the availability of venture capital in the university’s area, the commercial orientation of university research

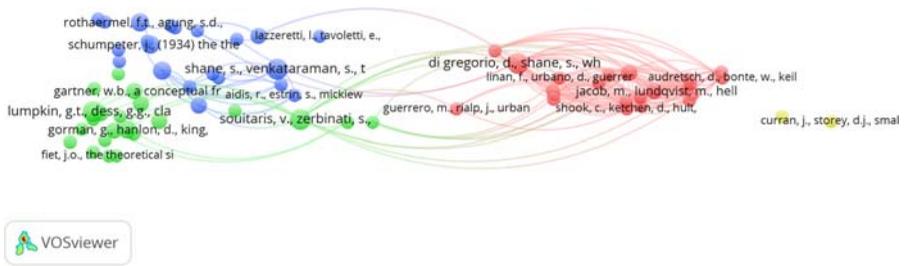


Figure 7.
Co-citation networks
and respective
clusters

Cluster 1: entrepreneurial universities (22 publications)

Article title	Author	Number of Co-citations	Objective	Methodology
“Why do some universities generate more start-ups than others?”	Di Gregorio and Shane (2003)	7	Examine the four factors that differentiate universities that create more new companies than other institutions do	Quantitative
“University entrepreneurship: taxonomy of the literature”	Rothaermel <i>et al.</i> (2007)	5	Present a detailed analysis and a synthesis of the research flow in university entrepreneurship	SLR
“The development of an entrepreneurial university”	Guerrero and Urbano (2012)	4	Contribute to a better understanding of the interrelationships of environmental and internal factors, identifying which are the most critical to conditions favouring university missions	Quantitative
“Entrepreneurial transformations in the Swedish university system: the case of Chalmers University of Technology”	Jacob <i>et al.</i> (2003)	4	Provide a bottom-up view of the transformation process, which describes and analyses universities’ internal processes in the context of national policy initiatives	Qualitative

Table V.
Cluster 1 publications
with more than three
co-citations

and development, intellectual eminence and university policies – that differentiate universities that create more new companies than other universities do. The results of this study show that the factors of intellectual eminence and university policies of investing in start-ups and keeping royalties low increase the creation of new companies (Di Gregorio and Shane, 2003).

Rothaermel *et al.*'s (2007) SLR analysed 173 publications on university entrepreneurship. Based on their analysis, the cited authors created a framework with which they could describe the dynamic process of university entrepreneurship. This framework could help guide future research.

Guerrero and Urbano's (2012) study verified which are the most critical factors that condition entrepreneurial universities in Spain. The cited research's results show that the most critical factor is the entrepreneurial attitude of teachers and students. This can be explained by the unique characteristics of each university community and its entrepreneurial attitudes, defined by a combination of factors such as entrepreneurship education, teaching methods and reward systems (Guerrero and Urbano, 2012).

Finally, the last article in Table V details an analysis of the internal processes of a Swedish university in the context of public initiatives. This study concluded that the creation of entrepreneurial universities takes several years to complete since institutional infrastructure and culture need to be changed to achieve success and the commercialisation of knowledge creates some degree of uncertainty about the role of universities.

4.4.2 Cluster 2: entrepreneurial spirit. In the second cluster (see Table VI), the set of identified studies examined the entrepreneurial spirit through research on the important processes and entrepreneurship education. When researchers study the entrepreneurial spirit of individuals, it is almost impossible not to speak of their entrepreneurial orientation and intention. According to Ajzen (1991), entrepreneurial intention is an indicator of individuals' willingness to try, level of effort and readiness to engage in certain behaviours. Thus, entrepreneurial intention is the cognitive representation of the willingness of individuals to behave in certain ways (Fayolle *et al.*, 2006). Entrepreneurial orientation has been recognised as the propensity to be innovative, proactive, open to risk, autonomous and aggressively competitive (Dess and Lumpkin, 2005; Bolton and Lane, 2012).

According to Lumpkin and Dess (1996), entrepreneurial orientation refers to the methods, practices and decision-making styles used when taking entrepreneurial actions. Through these, individuals or companies opt for proactive and aggressive initiatives to change the competitive landscape to their benefit.

According to Table VI, the second cluster is composed of 22 publications of which nine have more than three co-citations. The first article reports a study of the relationship between entrepreneurial orientation and company performance in order to suggest an alternative model.

The second article details a conceptual framework for entrepreneurship that explains and predicts a set of empirical phenomena. Shane and Venkataraman (2000) believe that their research provides a starting point for future studies since it incorporates information gained from many disciplines' points of view, thus exploring different methodologies.

The study reported in the article "Do entrepreneurship programmes raise entrepreneurial intention of science and engineering students? The effect of learning, inspiration and resources" tested the impact of entrepreneurship education on the attitudes and intentions of science and engineering students. (Souitaris *et al.*, 2007) report that entrepreneurship education programmes strengthen some attitudes and the entrepreneurial intention of participants, with inspiration being the biggest benefit provided by these programmes.

The SLR conducted by Gorman *et al.* (1997) focused on publications on entrepreneurship education, business education and management education for small

Cluster 2: entrepreneurial spirit (22 publications)					
Article title	Author	Number of Co-citations	Objective	Methodology	
“Clarifying the entrepreneurial orientation construct and linking it to performance”	Lumpkin and Dess (1996)	7	Clarify the nature of the construction of entrepreneurial orientation and propose a contingency framework to investigate the relationship between entrepreneurial orientation and company performance	Qualitative	
“The promise of entrepreneurship as a field of research”	Shane and Venkataraman (2000)	7	Create a conceptual framework to explain and predict a set of empirical phenomena about entrepreneurship	Conceptual	
“Do entrepreneurship programmes raise entrepreneurial intention of science and engineering students? The effect of learning, inspiration and resources”	Souitaris <i>et al.</i> (2007)	7	Test the impact of entrepreneurship education on the attitudes and intentions of science and engineering students	Quantitative	
“Some research perspectives on entrepreneurship education, enterprise education and education for small business management: a ten-year literature review”	Gorman <i>et al.</i> (1997)	5	Survey the literature from 1985 to 1994 to evaluate the progress of entrepreneurship education	SLR	
<i>The Theory of Economic Development</i>	Schumpeter (1934)	5	Investigate profit, capital, credit, interest and the business cycle	Conceptual	
“A Theory of entrepreneurial opportunity identification and development”	Ardichvili <i>et al.</i> (2003)	4	Study the process of development and recognition of opportunities	Conceptual	
“A conceptual framework for describing the phenomenon of new venture creation”	Gartner (1985)	4	Examine the phenomenon of the creation of new enterprises	Conceptual	
“Enterprise education: influencing students”	Peterman and Kennedy (2003)	4	Study the effect of business education on perceptions of entrepreneurship among adolescents	Quantitative	
“Entrepreneurship education: a systematic review of the evidence”	Pittaway and Cope (2007)	4	Explore different themes of entrepreneurship education through an SLR	SLR	

Table VI.
Cluster 2 publications with more than three co-citations

enterprises, from 1985 to 1994. The cited study sought to examine theoretical and empirical articles in these areas with a focus on the market, in order to be able to suggest new lines of research.

The book *The Theory of Economic Development* by Schumpeter (1934) addresses the business functions whose essence is the recognition and exploitation of new possibilities in the economy. Schumpeter (1934) argues that anyone can carry out in entrepreneurial functions and become enterprising.

Ardichvili *et al.* (2003) proposed a theory of the process of identification of opportunities based on the identification of entrepreneurs' personality traits, social networks and knowledge of business opportunities. The cited authors identify multiple stages in this

process in which entrepreneurs play proactive roles, arguing that individual and situational differences influence the process as well.

Gartner (1985) developed a framework for describing the creation of new companies, which integrates four main perspectives: characteristics of individuals starting companies, the organisations they create, the environments that surround them and the process of creating new companies. According to Peterman and Kennedy (2003), the effect of participation in a business education programme significantly increases perceptions of the desirability and feasibility of starting a business.

The last article presented in Table VI is an SLR on entrepreneurship education. Based on their review, Pittaway and Cope (2007) concluded that entrepreneurship education has an impact on students' propensity and intentionality, but the results are unclear about to what extent education enables students to become more effective entrepreneurs. The cited authors also note a lack of consensus on what should constitute entrepreneurship education after programmes are implemented.

4.4.3 Cluster 3: business creation process. The third cluster is composed of 21 publications that focus on the process of creating new companies. As can be seen in Table VII, five publications present more than three co-citations.

Even though the article "Why do some universities generate more start-ups than others" is associated with the first cluster, it also appears in this cluster because it addresses the factors that make universities create more companies than other institutions do. The second article compares individuals involved in business creation activities with a control group, following the process of setting up a company for 18 months. The results show that individuals with a higher level of human capital are more likely to discover new opportunities to start their own business and that the same is true for individuals with higher social capital (Davidsson and Honig, 2003).

Arenius and Minniti's (2005) research focused on individuals from 28 countries in order to understand which variables are significant in the decision to become an entrepreneur. The variables studied were demographic characteristics, economic characteristics, opportunities, fear of failure and confidence in personal capacities. The cited study showed that the variables are significantly related to company creation in all the countries under analysis (Arenius and Minniti, 2005).

Article title	Cluster 3: business creation process (21 publications)			Methodology
	Author	Number of Co-citations	Objective	
"Why do some universities generate more start-ups than others?"	Di Gregorio and Shane (2003)	7	Examine the four factors that differentiate universities that create more new companies than others do	Quantitative
"The role of social and human capital among nascent entrepreneurs"	Davidsson and Honig (2003)	5	Study human and social capital and their influence in the emergent phases of the entrepreneurial process	Quantitative
"Perceptual variables and nascent entrepreneurship"	Arenius and Minniti (2005)	4	Identify which variables are correlated with individuals' decision to become an entrepreneur	Quantitative
"Resources, capabilities, risk capital and the creation of university spin-out companies"	Lockett and Wright (2005)	4	Study the capacities of technology transfer offices and their influence on the creation of university spin-offs	Quantitative
<i>The Theory of Economic Development</i>	Schumpeter (1934)	4	Investigate profit, capital, credit, interest and the business cycle	Conceptual

Table VII.
Cluster 3 publications
with more than three
co-citations

Lockett and Wright (2005) verified that the commercialisation of knowledge and technologies developed in universities is increasingly important given their concerns about the returns on intellectual property. The results highlight the importance of the resource reservation and capacity building of technology transfer agents, preferably associated with a broad base of business skills.

The last document in Table VII is the book written by Schumpeter (1934) that also appears in Table VI of the second cluster. This book is considered the first work in the literature on entrepreneurship and economic evolution (Becker *et al.*, 2012). Schumpeter (1934) points out that resistance to entrepreneurship plays a crucial role in blocking economic development. For the cited author, innovation is about new combinations, and entrepreneurs play a fundamental role in the development of these combinations (Schumpeter, 1934).

5. Discussion of results

Figure 8 depicts the involvement of the three clusters of co-authors in research on the role of entrepreneurship education and training in regional development. Universities foster the entrepreneurial spirit through education or training for entrepreneurship, which leads to the beginning of the process of business creation and gives rise to start-ups or spin-offs, thus

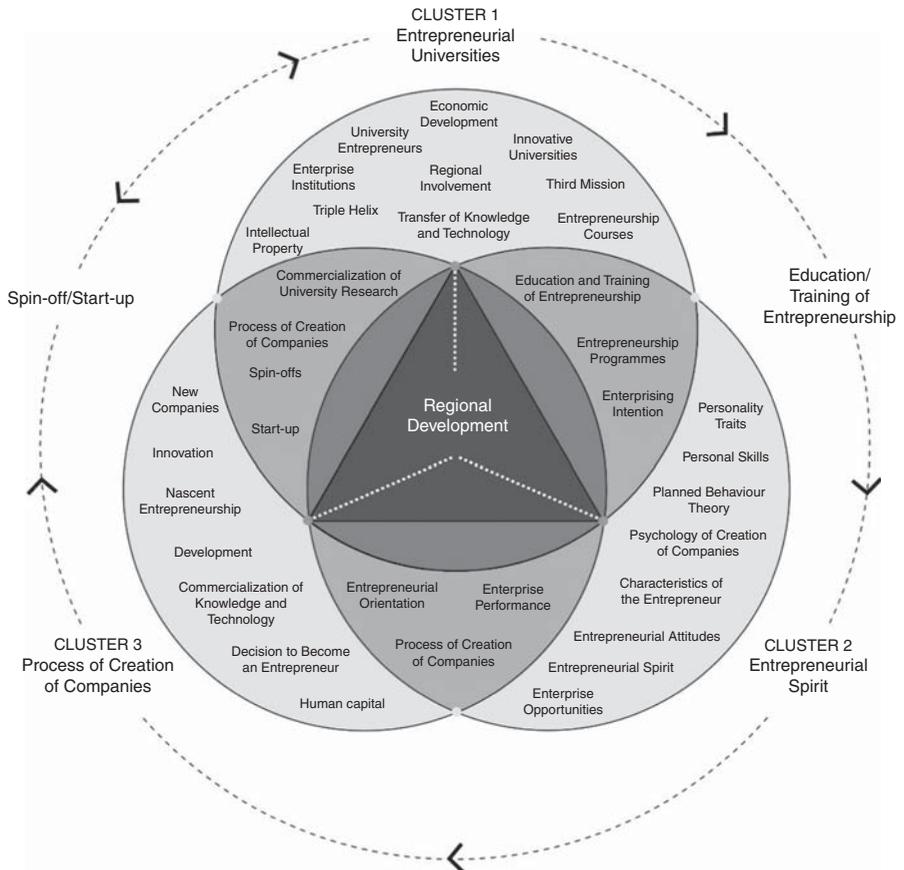


Figure 8. Major areas in the role of entrepreneurship education and training in regional development

contributing to the development of regions. However, universities can contribute directly to the creation of start-ups or spin-offs without becoming involved in the process of education or training for entrepreneurship.

After an analysis of the main publications of the three clusters identified, the conclusion was reached that these clusters have a strong connection to each other and show complementarity. This means that, when researchers focus on the business creation process and entrepreneurial spirit, almost inevitably, the role of universities will be examined since these institutions already play an increasingly important role in these areas (Etzkowitz *et al.*, 2000).

In recent years, universities have shown a strong interest in contributing to increasing the entrepreneurial spirit of their students and the surrounding society. What has happened is that more and more universities have played a strategic and fundamental role in regional development (Bramwell and Wolfe, 2008) by contributing to the transfer of research to enterprises, contributing to entrepreneurship education or supporting the process of setting up businesses (e.g. Di Gregorio and Shane, 2003; Rothaermel *et al.*, 2007; Astebro *et al.*, 2012).

In this context, universities need to give priority to not only entrepreneurship education but also programmes that increase the entrepreneurial spirit of their students and society at large, thus contributing to business creation and regional development. According to Souitaris *et al.* (2007), entrepreneurship education programmes function as sources of inspiration that stir up emotions and change mentalities, which lead to an increase in entrepreneurship.

6. Conclusions and recommendations

After analysing the articles reviewed, the results support the conclusion that the significance of entrepreneurship education in regional development has become more obvious over the last decade. Researchers and policymakers have reached a consensus that entrepreneurship education is a strategic tool for regional growth and development (European Commission, 2013; Lindh and Thorgren, 2016) because this type of education contributes to the development of skills and competencies in society and the creation of new jobs. According to Fayolle and Klandt (2006), entrepreneurship education should focus not only on knowledge about business creation but also on the processes of building the capacity for and interest in entrepreneurship.

The present SLR identified three clusters of studies that are related to the topic under study. While the first cluster focuses on entrepreneurial universities, the second cluster addresses the entrepreneurial spirit, and the third cluster examines the business creation process. Although these three clusters are different, a strong connection and complementarity exists between them. This means that, in order to study the process of business creation, researchers must focus on the entrepreneurial spirit and entrepreneurial universities since these have contributed the most to the development of education and training for entrepreneurship and, in turn, to regional development. That is, universities have a fundamental role in education and training for entrepreneurship, and this promotes the entrepreneurial spirit, thereby increasing the number of enterprises created and contributing to the economic development of regions (Di Gregorio and Shane, 2003; Lockett and Wright, 2005; Souitaris *et al.*, 2007).

The three clusters of co-authors also contribute to a better understanding of which areas have been studied the most and of how researchers relate to each other, which helps to identify current and future trends. The present study was able to verify that entrepreneurship education has gained considerable importance among policymakers and researchers (Gordon *et al.*, 2012; Abou-Warda, 2016). This strong interest has given rise to a number of European, national and regional support programmes that support new entrepreneurs, who are typically enrolled in entrepreneurship training programmes. A number of research programmes also seek to foster job creation. Thus, entrepreneurship education is now an area of high priority as these programmes promote regional, national and European job creation and development.

Another trend that also was verified is that some studies (Breznitz, 2011; Lyytinen and Holttä, 2011; Bergmann *et al.*, 2016) have identified the triple role of universities, governments and companies as a mechanism promoting entrepreneurship in regional development. Despite this field of study only being a few years old, it is already an area of great interest both to academics and policymakers.

In the course of this investigation, some limitations were revealed that need to be taken into account in future research. One limitation observed was that this study was restricted to only one database (i.e. Scopus), so the ideal would be for future research to combine the database used here with the Web of Science database, thus covering a greater number of articles. Another limitation was subjectivity, as, even after taking every precaution, this type of study always involves some subjectivity in both the classification of articles and the choice of keywords and steps to follow. The final limitation is related to how book chapters, books and conference articles were not included in the document analyses.

This study was able to identify some gaps in the existing literature that suggest future lines of investigation, which can be grouped into the three clusters previously identified. Cluster 1 (entrepreneurial universities) suggests research is needed on:

- The role of universities in regional development, especially in low density areas.
- The role of the third mission in the strategic management of universities.
- The relationship between the transfer of knowledge and technology and business realities.
- Reasons to rethink entrepreneurship programmes taught both inside (i.e. higher education) and outside (i.e. training) universities.
- Entrepreneurship education programmes involving universities, governments and companies. Although studies have begun to focus on this area, none have yet researched the impact that these programmes have on regions and the contribution of these three entities to this process.
- Analyses of entrepreneurship education programmes that include regional and international variations to improve education programmes, as advocated by Nabi and Holden (2008).

Cluster 2 (entrepreneurial spirit) shows gaps in research on:

- The behaviours and characteristics of entrepreneurs to stimulate debate about the introduction of curricular units that work more on characteristics inherent to entrepreneurs such as creativity, innovation, leadership and autonomy.
- Ways that entrepreneurship programmes can influence entrepreneurial intent and attitudes (Béchar and Grégoire, 2005).

Cluster 3 (business creation process) reveals the need for more studies of:

- The business creation processes that fit best in each sector and region.
- The role of universities and stakeholders in the process of setting up companies.
- The importance of cooperation networks in the process of setting up companies.
- The processes of creating companies that can take into account entrepreneurial ecosystems and sustainable entrepreneurship practices.

The future of regional economies depends heavily on young people's entrepreneurial activities since the business world is constantly undergoing changes. Therefore, education, in general, and entrepreneurship education, in particular, urgently need stronger support from public authorities and society at large.

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