

Systematic Literature Review: Sustainability practices in Start-ups

Andrei Boar-Boar

UPF Barcelona School of Management

Marc Oliveras-Villanueva

UPF Barcelona School of Management

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ABSTRACT

Start-ups and sustainability are growing in our society. For this reason, this paper is written with the aim to realize a systemic review of the literature in this topic. It analyses the characteristics of investors and entrepreneurs, the impact of existing green start-ups in society and if the institutional support is important for the development of the company. The most relevant results of each section show that the principal motivation of entrepreneurs is their social awareness with sustainability; traditional investors avoid investing in green start-ups; green start-ups need to use different management models than traditional start-ups; institutional support is crucial for the development and growth of a start-ups. However, it has been detected many gaps in the literature and to solve them, the paper proposes up to eight research questions to create a future agenda of investigation.

KEY WORDS

Start-up, sustainability, investors, entrepreneurs' behavior, institutions.

1. Introduction

In recent years, the number of start-ups and the awareness of society about sustainability has grown around the world. In Barcelona alone, more than 1,300 start-ups existed by the end of 2018, being the fifth most start-up-abundant city in Europe (*Analysis of the Barcelona Camp; Catalonia Startup Hub*, 2018). In the literature, we find a growing number of articles that discuss how start-ups can improve the sustainability of the planet. According to (Blank & Dorf, 2012), a start-up is an organization formed to search for a repeatable and scalable business model. Sustainability from the ecological point of view is the ability of nature to regenerate itself or the ability to maintain itself at a certain level of development (Geissdoerfer, Savaget, Bocken, & Hultink, 2017).

Although there are articles that address sustainability in start-ups, they are still very limited and unstructured. In several cases, the results contradict each other due to the speed with which the market changes, the evolution of the number of start-ups and the growing social awareness of the environment.

The pursuit of economic and business benefits without taking into account the sustainability of the planet has been the usual trend of companies throughout history. Currently, social awareness towards caring for the environment gives companies the opportunity to obtain economic and environmental benefits (Sunny & Shu, 2019). The appearance of technological start-ups on the market should be used to unite both worlds. Increased knowledge regarding the subject will lay the foundation that will allow start-ups to find paths of growth and scalability towards sustainability.

In relation to the above, this article aims to review the literature to identify the characteristics of entrepreneurs and investors who are committed to sustainable start-ups, whether institutional support has an effect on the sector or not and, finally, to analyse the impact that existing start-ups have had on the economy. This analysis will allow us to open new lines of research in the future.

The following article is divided into 4 sections. After the introduction, the methodology used, and the descriptive analysis are explained in the second section. The third section presents the content of the selected articles in the review process. The fourth and final section presents the conclusions and future implications.

2. Methods

In this article, we report a systematic review of the literature on sustainability in start-ups. A systematic review is a general description of the scientific contributions made so far.

This method is defined in 10 steps, starting with the identification of keywords and ending with the validation of the articles with the appointment method described by Greenhalgh. Other authors, such as Petticrew and Roberts, propose a conceptualization of systematic reviews as a focus on identifying, evaluating and synthesizing all relevant scientific studies on the defined topic and structure a review with 12 steps (Petticrew & Roberts, 2006). Other authors structure systematic reviews in 2 main processes (Easterby-Smith, Thorpe, & Jackson, 2012). The first defines the review protocol and the relevance of the research studies in the specific field. The second identifies the main findings to identify gaps in research knowledge in the field. In line with (Centobelli, Cerchione, & Esposito, 2017) and with the contributions of previous authors, this review is organized as follows:

1. Phase 1: acquisition and selection of papers:
 - a) Search phase: This phase includes the selection of keywords and the choice of databases as Web of Science and Scopus.
 - b) Selection of papers: in this step we have defined the criteria for the selection of papers, and we have selected them.

2. Phase 2: descriptive and content analysis of the selected papers:
 - a) Descriptive analysis: The papers are aggregated according to time and thematic areas.
 - b) Content analysis: papers are studied and explained by thematic areas showing the strengths and weaknesses in the literature and the future research on the topic.

2.1. Search phase

The databases selected for the literature search were Scopus and Web of Science. Articles from between 1990 and March 2019 were selected. The keywords set for the search were "sustainability" and "sustainable" combined with "startup*", "start-up*", "start up" and "start ups". The use of the asterisk allows search results that include all the same words but with different terminating letters. In addition, the criteria of only selecting scientific articles and only if they are available in English and Spanish are added.

A total of 1291 articles were found in the 2 databases based on the criteria cited.

Key words used	("sustainability" o "sustainable") and ("startup*", "start-up*", "start up" or "start ups")
Date range	Published from 1990 to April 2019
Web of Science database	654
Scopus database	637
Total de papers	1291
Duplicates	295
Total without duplicates	1008

Figure 1. Relation of papers by key words.

2.2. Selection phase

With the objective of focusing on research articles most related to the subject under study, some criteria have been defined to identify the scientific articles; these criteria can be seen in Table 2.

Criteria	Definition
First criteria: focused on abstracts	Selection of papers which are focused on start-ups and sustainability according to their abstracts
Second criteria: focused on content	From the list of papers selected by the first criteria, selection of papers which focus on start-ups and sustainability according to their content.

Figure 2. Selection criteria.

After analysis using the first criterion, the articles are classified into 4 possible categories:

Category 1: articles that focus on the 2 keyword concepts: start-ups and sustainability;

Category 2: articles that only focus on sustainability and do not refer to start-ups or do so in a non-relevant way;

Category 3: articles that only focus on start-ups and do not refer to sustainability or do so in a non-relevant way; and

Category 4: articles that do not focus on either of the 2 concepts or do so on either of them but with a totally different definition.

Category	Number of papers
Category 1	50
Category 2	406
Category 3	295
Category 4	257
TOTAL	1008

Figure 3. Number of papers by categories.

The articles that are included in categories 2, 3 and 4 (a total of 958 articles) are excluded from the research because they are not focused on the research objectives. With the first criterion, focusing on *abstracts*, and with the second criterion, exhaustively analysed articles, 50 articles are selected for the descriptive analysis phase.

2.3. Descriptive analysis phase

In this phase, the main objective is a descriptive analysis of the articles that focus on sustainability in the context of start-ups. They have been analysed from 4 perspectives.

1. Articles by time.
2. Articles by journals.
3. Articles by methodology.
4. Articles by areas.

2.3.1. Articles by time

The analysis of the articles by time (Figure 4) shows that there are no articles on start-ups and sustainability before the year 2002. Until 2014, the number of articles was very small. Since 2014, the number of articles has increased; the year with the most is 2016, with 11 articles. The trend indicates a growing number of studies in recent years.

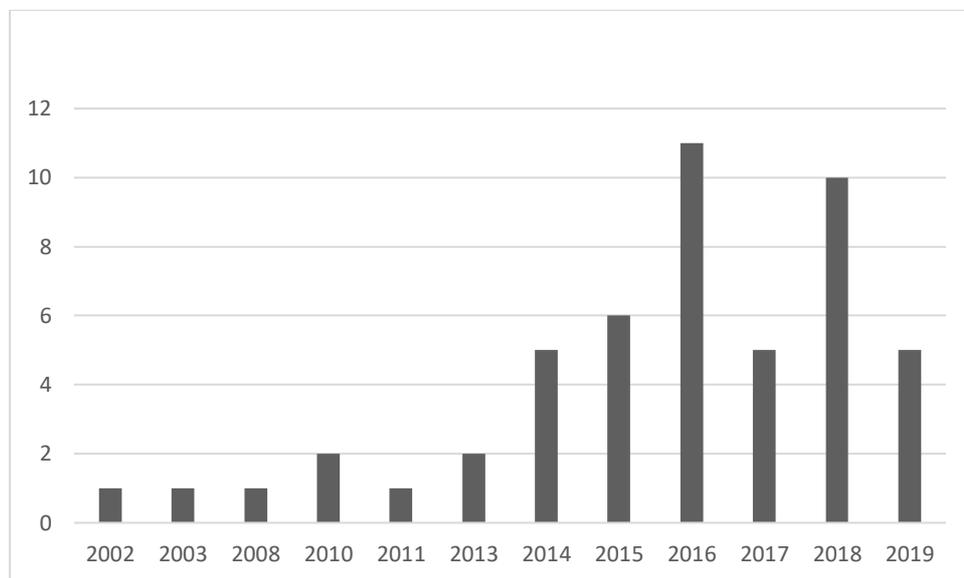


Figure 4. Distribution of articles per years.

2.3.2. Artículos por revistas

Journal	Environmental Science	Social Sciences	Business, Management and Accounting	Economics, Econometrics and Finance	Decision Sciences	Energy	Engineering	Psychology	Computer Science	Agricultural and Biological Sciences	Science Technology
Greener Management International	X	X									
Business strategy and the environment	X	X	X								
Journal of Developmental Entrepreneurship			X	X							
Journal of Business Venturing			X								
Corporate Social Responsibility and Environmental Management	X	X	X								
International Journal of Accounting & Information Management			X	X							
International Small Business Journal			X								
Management Decision			X		X						
International Journal of Environmental Research	X										
Journal of Cleaner Production	X		X			X	X				
Australasian Journal of Environmental Management	X	X									
International Journal of Innovation and Technology Management			X								
Global Journal of Flexible Systems Management			X								
Journal of Entrepreneurship education		X	X	X							
Sustainability	X	X				X					
Business Strategy and the Environment	X	X	X								
Journal of Small Business and Enterprise Development			X								
Journal of International Management			X	X							

Industry and Higher Education		X	X		
Psycology	X				X
International Journal of Business Science & Applied Management			X		
Business Horizons			X		
Telematics and Informatics		X		X	X
International Entrepreneurship and Management Journal			X		
British Food Journal			X		X
Small Business Economics			X	X	
Journal of International Entrepreneurship			X		
Administrative Sciences		X			
Amfiteatru Economic Journal		X			
World Journal of Entrepreneurship, Management and Sustainable Development		X			X
The East Asian Journal of Business Management		X			
International Journal of Entrepreneurial Behavior & Research		X			X
Sustainable Business Models		X			X
Cities and Sustainable Technology Transitions: Leadership, Innovation and Adoption		X			X
Asian Journal of technology innovation		X			X

Figura 5. Distribución de artículos por revistas.

2.3.3. Articles by methodology

In relation to the methodology used by the authors, the majority of the articles use qualitative methods, with a total of 27 (Figure 5), followed by quantitative methods, with 11 articles, mixed methodology that combines qualitative methods and quantitative methods, with 7, conceptual methods, with 3, and a systemic review of the literature, with 1.

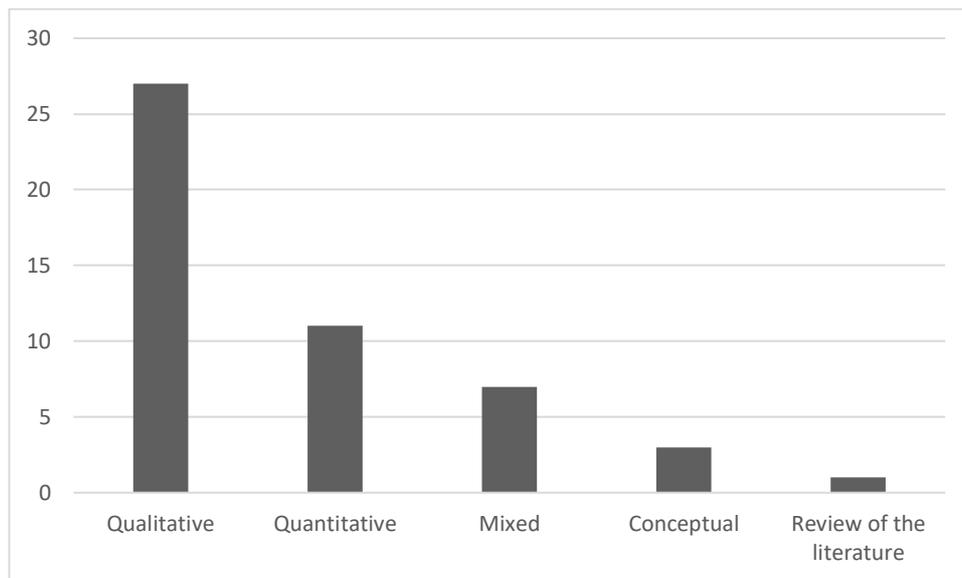


Figure 6. Distribution of articles by methodology

2.3.4. Articles by areas

The articles have been divided into 4 main areas to provide an overview of the literature:

1. Characteristics of entrepreneurs, where the entrepreneurs' factors to start a sustainable start-up are sought, as well as their success and failure factors;
2. Characteristics of investors, where the attitude and disposition of these towards investment in sustainable start-ups is analysed;
3. Analysis of existing start-ups, where the effects of these companies on the environment and the business practices they use in management are analysed; and
4. Impact of institutional support, which analyses whether institutions have an impact on the creation of start-ups.

Figure 6 shows that the category “characteristics of entrepreneurs” applies to the most articles, with a total of 20, followed by “impact of institutional support”, with 13 articles,

“analysis of existing start-ups”, with 9 articles, and “characteristics of investors”, with 8 articles.

Category	Reference	Key concepts
1. Characteristics of entrepreneurs	(Schick, Marxen, & Freimann, 2002)	Entrepreneur’s behavior
	(Diochon, Menzies, & Gasse, 2008)	Success factors
	(Hockerts & Wüstenhagen, 2010)	Company size
	(Rodgers, 2010)	Entrepreneur’s behavior
	(Lourenço, Jones, & Jayawarna, 2013)	Sustainability education
	(Javier Maqueda Lafuente, María Gil Lafuente, F. Guzman-Parra, & Gil Lafuente, 2013)	Success factors
	(Kirkwood & Walton, 2014)	Entrepreneur’s behavior
	(Galpin & Hebard, 2015)	Entrepreneur’s behavior
	(Ruiz-Ruano & Puga, 2016)	Entrepreneur’s behavior
	(Majid & Yaqun, 2016)	Entrepreneur’s behavior
	(Piccarozzi, Piccarozzi, & Michela, 2017)	Sustainability compliance
	(Villa Todeschini, Nogueira Cortimiglia, Callegaro-De-Menezes, & Ghezzi, 2017)	Company size
	(Reynolds, Sheehan, & Hilliard, 2018)	Success factors
	(St-Jean & Labelle, 2018)	Entrepreneur’s behavior
	(Nejabat, Taheri, Scholten, & van Geenhuizen, n.d.)	Success factors
	(Zeng, 2018)	Success factors
	(Szumniak-Samolej, 2018)	Entrepreneur’s behavior
	(Dickel, Hörisch, & Ritter, 2018)	Sustainability compliance
	(Zolfaghari Ejlal Manesh & Rialp-Criado, 2019)	Internationalization
(Ball & Kittler, 2019)	Entrepreneur’s behavior	
2. Characteristics of investors	(Randjelovic, O’Rourke, & Orsato, 2003)	Sustainable investment funds
	(Eyo, 2014)	Development of start-ups
	(Bocken, 2015)	Success and failure factors
	(Bergset, Bergset, & Linda, 2015)	Investors’ behavior
	(De Lange, 2017)	Investors’ behavior
	(Hasani, Bojei, & Dehghantanha, 2017)	Success and failure factors
	(Antarciuc et al., 2018)	Investors’ behavior
	(Bergset, 2018)	Investors’ behavior
3. Analysis of existing start-ups	(Clarke-Sather, Hutchins, Zhang, Gershenson, & Sutherland, 2011)	Indicators system
	(Bocken, Short, Rana, & Evans, 2014)	Sustainable business model

	(Sáez-Martínez, Díaz-García, & González-Moreno, 2014)	Innovation and profits
	(Nak-Kyo & Park, Won-Koo ; Sung-Soo, 2014)	Risk of failure
	(Valentin, Pinzaru, Vătămănescu, & Stanciu, 2015)	Marketing
	(Malindretos, Tsiboukas, & Argyropoulou-Konstantaki, 2016)	Waste management
	(Henry, Rushton, & Baillie, 2016)	Sustainable business model
	(Antikainen & Valkokari, 2016)	Sustainable business model
	(Franceschelli, Santoro, & Candelo, 2018)	Sustainable business model
4. Impact of institutional support	(Noyes, 2015)	Sustainability education
	(Putri & Fujiwara, 2015)	Investment as government support
	(Jagoda, Lin, Calvert, & Tao, 2016)	Incubators
	(Steinz, Van Rijnsoever, & Nauta, 2016)	Market barriers
	(Bank & Kanda, 2016)	Incubators
	(De Lange, 2016)	Emerging economies
	(De Lucia, Balena, Stufano Melone, & Borri, 2016)	Institutional support initiatives
	(Ge et al., 2016)	Institutional support initiatives
	(Bank, Fichter, & Klofsten, 2017)	Incubators
	(Kanda, Hjelm, Clausen, & Bienkowska, 2018)	Institutional support initiatives
	(Sher, Mazhar, Zulfiqar, Wang, & Li, 2019)	Market barriers
	(Demirel, Li, Rentocchini, & Tamvada, 2019)	Sustainability factors in start-ups
	(Sunny & Shu, 2019)	Institutional support initiatives

Figure 7. Distribution of articles by areas

3. Content analysis phase

The analysis of 50 articles does not allow us to have a broad and detailed view of what the literature covers regarding start-ups and sustainability. The review of all of them allows us to distinguish 4 main sections that are covered by the authors: Section 1, characteristics of the entrepreneurs; Section 2, characteristics of investors; Section 3, analysis of existing sustainable start-ups; and Section 4, impact of institutional support; The sections are described in the following paragraphs.

3.1. Characteristics of entrepreneurs

(Schick et al., 2002) compare the creation process of conventional start-ups with that of start-ups focused on sustainability and conclude that the fundamental factor that differentiates them is the attitude of the entrepreneur.

(Dicochon et al., 2008) analyse the success factors of a random sample of Canadian start-ups. The results indicate that a key factor for success is the capacity of financial management, which is closely associated with sustainability.

(Hockerts & Wüstenhagen, 2010) theorizes on how entrepreneurs opt for sustainability, taking into account that roles in the case of small or large companies are different. The results indicate that entrepreneurs are strongly committed to sustainability because they are small, but once they grow, they are pressured by factors such as cost and quality and reduce their commitment to sustainability.

(Rodgers, 2010) analyses the behavior of sustainable entrepreneurs and opens the door to future research. The preliminary results of his research indicate that entrepreneurs have a strong appreciation for sustainability, and although they seek other objectives such as financial objectives, sustainability is a fundamental pillar.

(Lourenço et al., 2013) seek relationships between sustainability education and the skills of 257 sustainable entrepreneurs using a survey. The results indicate a solid relationship between the knowledge learned and the intentions of the entrepreneurs to exploit them in their favour.

(Javier Maqueda Lafuente et al., 2013) conducted a survey of Spanish start-ups between 2006 and 2010 to examine their success factors. The results indicate that these factors are the need for financing, marketing, innovation, efforts in internationalization and sustainability.

(Kirkwood & Walton, 2014) investigate how sustainable entrepreneurs manage their business taking into account the environment. They contacted 350 New Zealand entrepreneurs in 2011 to participate in a survey, of which 84 answered. The results indicate that this category of entrepreneurs prioritizes the environment to the benefits

whenever possible; in addition, they try to leave the minimum possible footprint on the planet. They seek a win-win scenario for the economy and the planet.

(Galpin & Hebard, 2015) compares the entrepreneurs' ideas of sustainability with the practices they carry out in the company through information extracted from the questionnaires. The results indicate that entrepreneurs value the idea of sustainability but rarely utilize it in their business activity.

(Ruiz-Ruano & Puga, 2016) perform an empirical study with 2,671 people distributed among teaching and research staff to learn characteristics related to entrepreneurship and sustainability. The results support the hypothesis that sustainability is associated with the desirability of creating a sustainable company.

(Majid & Yaqun, 2016) conducted an interview with 50 entrepreneurs specializing in the sustainable market. The results indicate that the key factor for becoming a sustainable entrepreneur is responsibility for the environment.

(Piccarozzi et al., 2017) analyses Italian start-ups based on whether the start-ups comply with social, economic or environmental sustainability aspects of the Italian Government Social Impact Assessment Document. Fifty-four of the 61 start-ups analysed meet at least one sustainability requirement.

(Villa Todeschini et al., 2017) investigate new business models in the fashion industry that have sustainability as their main characteristic. They find differences within start-ups and traditional companies in the application of new sustainable business models due to their rigidity, the use of technology and the essence of sustainability.

(Reynolds et al., 2018) performs an analysis of 10 sustainable entrepreneurs regarding how prior knowledge, sustainability orientation and sustainability intent have affected them. It does not seem that the first 2 factors are relevant, but sustainability intent explains their motivation.

(St-Jean & Labelle, 2018) studies the factors under which people decide to become sustainable entrepreneurs based on a sample of 197 college students who want to be

entrepreneurs. The results indicate that sustainable orientation has a negative impact on individuals' entrepreneurship.

(Nejabat et al., n.d.) seek the conditions for ecological start-ups or spin-off companies to innovate renewable energy products with rapid market access. The analysis is performed on a sample of 37 spin-offs and 4 start-ups. The key factors are the attitude of entrepreneurs and access to investment.

(Zeng, 2018) identifies, through the use of big data, the 5 success factors of green and sustainable entrepreneurship. The results indicate that the key factors are ecological actions, collective spirit, challenge and learning, crowd funding and greater benefits than traditional start-ups.

(Szumniak-Samolej, 2018) conducted, between July and September 2015, random interviews with sustainable Polish entrepreneurs. This study seeks to identify, describe and compare the basic hypotheses and the most important elements that characterize them as sustainable business models.

(Dickel et al., 2018) find a relationship between whether companies have an external or internal environmental orientation and the networking they carry out. From a sample of 248 technology start-ups, the study concludes that companies with a strong external environmental component have greater contact networks. In contrast, an internal component is related to a smaller network.

(Zolfaghari Ejlal Manesh & Rialp-Criado, 2019) investigate the sustainability and internationalization of entrepreneurs through 6 Spanish start-ups competing in the renewable energy industry seeking rapid internationalization. The results indicate that sustainability and making the planet a better place to live are the entrepreneurs' psychological factors for internationalization.

(Ball & Kittler, 2019) analyse the intentions of environmental entrepreneurs on the importance and effectiveness of measures to support development in start-ups in the UK, France and Germany. They believe that these mechanisms are essential to adopt ecological innovations and improve the market for green start-ups.

The content analysed in this section shows that the main characteristic of entrepreneurs to create sustainable start-ups is their commitment to the environment, which usually originates from education; however, there is some contradiction in the literature regarding the origin. In any case, this commitment is very firm when the company is in the start-up phase, but as it grows, this idea is increasingly abandoned, to the point that it is not seen in the operations of the company once the company is large. Having a sustainable idea and creating public impact with it allows you to create a broad network of contacts; however, if this idea is not made public, it has no effect. The literature does not provide much evidence that, in addition to the ideas of its entrepreneur, another key factor for a start-up is the need for financing for growth. Section 4 analyses the characteristics of sustainable investors.

All these results show that the market is not yet sufficiently prepared for the adoption of sustainability in businesses. It is necessary to continue investigating what would be needed in the market so that these companies could grow while maintaining the idea of sustainability as a basis.

3.2. Characteristics of investors

(Randjelovic et al., 2003) analyse the investment funds that are beginning to specialize in sustainable entrepreneurship. In addition, they also describe the characteristics of the sector and the processes that are carried out. Finally, the authors describe the problems encountered by investment funds and entrepreneurs.

(Eyo, 2014) analyses the biotechnology start-ups that were created in Japan in the 1990s, when the government introduced incentives for these companies. Although the number of start-ups multiplied 5-fold, the vast majority have not managed to develop as large companies. The main cause is the lack of a sustainable investment system.

(Bocken, 2015) analyses how investment funds can contribute to the sustainable development of companies, studying their functions, motivations, obstacles and reasons for success. The results indicate that the failure factors are a lack of investors specializing in sustainability and a short-term mentality; success factors include an innovative business model in addition to collaborations. Sustainable investors can help business models succeed, co-invest in reducing risk and maintain balance in business and environmental development.

(Bergset et al., 2015) indicates that green start-ups have even more difficulties than do traditional start-ups in accessing financing because their sole objective is not to obtain benefits. This fact drives investors away.

(De Lange, 2017) analyses 300 start-ups in 30 different cities to determine whether sustainability in start-ups is rewarded by investors. The results indicate that investors avoid companies that are committed to environmental sustainability.

(Hasani et al., 2017) investigate the use of social customer relationship management (SCRM) in start-ups and seek to determine whether it is a factor of success or failure. The results that affect sustainability indicate that factors such as investment, crowd funding, government support and the support of business angels positively affect the decision to use SCRM.

(Bergset, 2018) indicates that start-ups that contribute to sustainability are sceptical of investment by third parties that have a different view of the business. In the case of investment, business angels request a lower return due to the special motivation of the founders.

The content analysed in this section defines the characteristics of investors who bet on sustainable start-ups. There is no doubt that investment is key for the development and growth of a start-up, as shown by the failure in Japan. Even so, in this sector, there seems to be great scepticism, both from the companies and the investors. The results indicate that traditional investors are opposed to investing in sustainable start-ups, as they are focused on short-term performance, which also makes it difficult for start-ups to seek financing because they have a business idea very different from the investors.

It seems that the only way to link supply with demand for financing is with the emergence of investors specializing in sustainable development, who also require a lower return on investment due to their strong commitment to the environment, in addition to being able to help reduce risk and maintain the balance between business development and the environment.

3.3. Analysis of existing sustainable start-ups

(Clarke-Sather et al., 2011) create indicators of the sustainability of a start-up, Ecologic Designs, that is responsible for recycling materials to make bags and accessories. Subsequently, they compare those indicators with a system of external indicators and allow management to choose which method is optimal. The results indicate that the company decided to use their created indicators system.

(Bocken et al., 2014) studied different business models to create one that can be applied to sustainability. The idea is to create models that can be explained in a simple way to accelerate sustainable business models. The relevant items to achieve this are energy efficiency, the creation of value from waste, introducing renewable processes and promoting self-sufficiency, among others.

(Sáez-Martínez et al., 2014) conducted a survey of 1,337 companies with a lifetime of less than 10 years seeking information on innovation and corporate profits. The results indicate that the environmental innovation of companies helps improve their profits.

(Nak-Kyo & Park, Won-Koo ; Sung-Soo, 2014) analyse the risk of the renewable energy start-ups sector with the implementation of the Altman Z-test. They collected information from 121 companies between 2006 and 2011. The results indicate that 38% of the companies are in the high-risk zone and that start-ups in the wind power sector are more prone to bankruptcy than those in the high-risk solar energy sector.

(Valentin et al., 2015) conduct an analysis of 104 start-ups in Romania on the correlation between sustainable entrepreneurship and the type of marketing they use described in "Contemporary Marketing Practices". The results indicate that start-ups that use a defined model are not more oriented towards sustainable development.

(Malindretos et al., 2016) presents a start-up in collaboration with the University of Athens that is responsible for the management of waste from wine on the island of Crete, transforming the challenges into opportunities to improve the efficiency of products and waste. The objective of the study is to facilitate the transformation of this industry towards a sustainable industry.

(Antikainen & Valkokari, 2016) describe innovation in business models taking into account the circular economy, using a case study of a start-up. The conclusions reached are that the innovation framework should be tested in different companies and industries and that this framework has to be constantly evolving.

(Henry et al., 2016) investigates how start-ups in the agricultural and veterinary world can ensure that the services they offer their customers are viable and sustainable. The results indicate that for the model to be sustainable, it is necessary for veterinary companies to be prepared to change with their clients, develop collaboration agreements and create joint market strategies.

(Franceschelli et al., 2018) study the application of a sustainable innovation model in an Italian start-up based on the use of ICT and sustainable materials that allow a lower impact on electricity consumption and CO₂ emissions.

The content analysed in this section shows that sustainable start-ups are based on the reduction in electricity consumption, the emission of CO₂, the reduction in waste and the introduction of sustainable processes in the daily activities of start-ups. The classical models of business management, such as indicators or traditional marketing, are not applicable to sustainable start-ups, which, with their own characteristics, must create their own models of management and control. In addition, not only should companies change but customers and large companies with which they conduct business should also change, adapting to the products of the start-ups and their sustainable orientation.

This highlights the need for the creation of management models, indicators and special marketing for sustainable start-ups. This gap in knowledge allows future research in this field.

3.4. Impact of institutional support

(Noyes, 2015) detail the process of how a team of entrepreneurs and engineering students has been able to create a social investment fund to invest in Ghana. They also indicate that institutions should educate innovators in sustainable entrepreneurship.

(Putri & Fujiwara, 2015) analyse the viability of a biological park in Indonesia specializing in agriculture and sustainable fisheries. The results indicate that if the

Indonesian government wants to encourage the appearance of start-ups in this park, it must invest in them.

(Jagoda et al., 2016) examine the use of and satisfaction regarding venture support agencies by small and medium enterprises in 14 communities in Canada. The results indicate that while many owners identified the need for their use for training and financing, others were dissatisfied, making the viability of risk and growth difficult.

(Steinz et al., 2016) explain the barriers that cleantech start-ups have for entering the Chinese market, caused mainly by Chinese regulations and the differences between the Chinese and Western mentality. Companies that want to access China, according to the authors, should be prepared, be flexible, listen to local specialists and collaborate with high reputation companies in the territory.

(Bank & Kanda, 2016) conduct empirical research on 3 start-up incubators in Sweden, Finland and Germany. The incubators studied aim to recruit and develop start-ups oriented towards sustainability, but they need a critical mass of companies to make it a reality.

(De Lange, 2017) develops a theory about the legitimacy of companies in the context of new clean technology start-ups that seek to develop in emerging economies with institutional gaps.

(De Lucia et al., 2016) evaluates the public initiative "Active Ingredients" in southern Italy to support entrepreneurs and investigates the relationship between creativity and sustainability between supply and demand. The results indicate that there is a latent relationship between creativity and sustainability in business initiatives: the potential propensity of decision makers to support sustainable entrepreneurs and the limited influence of creativity and sustainability proposals during the process.

(Ge et al., 2016) analyses, using a survey, 235 ecological start-ups in China. The empirical results indicate that ecological start-ups have sustainable behaviors that allow them to differentiate themselves from their competitors and obtain a reduction in gas emissions,

energy costs and accident risks. A determining factor to take into account is institutional pressure to follow ecological pathways.

(Bank et al., 2017) study the case of Green Garage Berlin, an incubator for sustainable start-ups, and the process of selecting companies. Regional and intra-regional cooperation in addition to the planning and structuring of application requirements are key to ensuring occupation of the sustainable incubator.

(Kanda et al., 2018) investigate the external help that sustainable entrepreneurs have to receive by conducting interviews with intermediaries in Sweden and Germany. The companies analysed work to demonstrate environmental benefits through the creation of pilot tests and the dissemination of information and brands.

(Antarciuc et al., 2018) identify the characteristics of sustainable investment funds in Saudi Arabia. The factors that cause the emergence of such funds are national regulation, international regulations for sustainable investments, commitment to sustainability and their perception of the need for business models.

(Sher et al., 2019) identify the barriers that exist in ecological entrepreneurship in agriculture in Pakistan. After identifying 34 barriers and classifying them into 6 majority groups, they conclude that the 2 main barriers are the development of the economy and the residual role of the government in this area.

(Demirel et al., 2019) conduct a review of the literature on sustainable start-ups and present a research agenda in the sector. The review takes into account factors such as the life cycle of the industry, knowledge, the support of institutions, the possibility of accessing external financing and the behavior of sustainable start-ups.

(Sunny & Shu, 2019) study how institutional factors such as local entrepreneurship and climate innovation affect the creation of businesses in the U.S. The study shows how social norms related to climate change affect the creation of businesses because they add legitimacy to sectors such as clean energy.

The content analysed in this section highlights the importance of the support of institutions and incubators in the development of start-ups and even more in the sustainability sector. Institutions should support the training of entrepreneurs with a sustainable point of view and, in addition, should support the creation of start-ups with actions such as facilitating financing. Also key is the development of the economy to improve the evolution of start-ups and the change in mentality in society, making the world more aware of the environment, which also influences the institutions that press for the creation of sustainable start-ups.

Notably, support agencies for start-ups or incubators where there is cooperation between territories and planning regarding the number of companies are keys to success because there must be a critical mass of companies.

All these results show that the key conditions for the development of sustainable start-ups are social awareness and institutional support. Governments should take positions on this issue and apply development policies, not only in this sector but in all areas of entrepreneurship.

4. Conclusions

The objective of this article is to conduct a systematic review of the literature on the subject of sustainability in start-ups, which will allow identifying key aspects already studied and will allow identifying missing aspects, opening the door to a research agenda to improve the existent literature.

In relation to the review carried out, this article aims to identify the characteristics of entrepreneurs and investors who are committed to sustainable start-ups, whether institutional support has an effect on the sector or not and, finally, to analyse the impact that existing start-ups have had on the economy.

The descriptive analysis of the articles allows us to have a global view of the literature review. The number of articles written on the subject has grown over the years. At the beginning of the 1990s, the issue was seldom addressed; in the period from 2015 to 2019, however, there was a large number of articles on this subject due to the proliferation of start-ups and sustainability awareness in society. The vast majority of articles use qualitative methods, with few using quantitative, conceptual or mixed methods.

The content of the articles analysed in the systematic review of the literature has allowed us to obtain the main areas covered by the researchers and has allowed us to identify the main gaps in knowledge for each topic.

In relation to the first area, the characteristics of entrepreneurs, the literature shows that the key factor for creating a sustainable start-up is the social awareness of the entrepreneur. This sustainable idea evolves as the company increases in size, going from being very strong at the beginning to being practically residual once the company is large. From the social point of view, the adoption of sustainability and its publicity allows an increase in the network of contacts and an acceleration in growth; in contrast, maintaining sustainability only internally has no impact on growth. It seems that education in sustainability is a factor to consider in order to find a sustainable entrepreneur, but the literature contradicts this element. Taking into account the above, 2 questions can be formed for future research:

RQ1: What are the social, economic and political factors that would allow the maintenance of sustainability in large companies?

RQ2: Is education on sustainability an essential factor for developing a sustainable start-up?

In relation to the second area, the characteristics of investors who bet on sustainable start-ups, the literature indicates that there has been an evolution in the market. Until 2017, traditional investors and sustainable start-ups approached each other with scepticism in this sector; investors avoided the environmental sector in favour of short-term economic benefits, and start-ups avoided traditional investors because they had different business visions. Since then, the literature indicates that sustainable investors, specialized in this type of start-up that strongly bet on them and seek a lower return due to their care for the environment, have become prominent. These investors have short-term goals, and for this reason, it is worth studying them more deeply in future articles to answer the following questions:

RQ3: What are the different characteristics of sustainable investors compared to traditional investors?

Q4: Are the long-term results of sustainable investors lower, equal or higher than those of traditional investors?

In relation to the third area, the analysis of the existing sustainable start-ups shows that companies specializing in sustainability have had a positive impact on the planet because they have allowed a reduction in electricity consumption and polluting gases, have improved waste management and have introduced sustainable processes in their daily activities. Customers and large companies must adapt to sustainable products and accept them in the market; marketing is essential to achieve this purpose, but traditional marketing is not efficient in this sector. In relation to management, the usual management and control models cannot be used in sustainable start-ups, which have their own characteristics. Research in this field is very limited, and for this reason, topics have been detected for future research:

RQ5: What different characteristics should a management and control model have in sustainable start-ups compared to traditional companies?

RQ6: What elements should guide the marketing strategy of a sustainable company?

Regarding the fourth area, the impact of institutional support, the literature shows that government support and change in society towards environmental awareness are key to the development and success of sustainable start-ups. Governments must provide resources for the creation of start-ups, and most importantly, they must facilitate business financing because this is the key fuel for start-up growth. Even so, it is also necessary for the economy itself to grow for new businesses to appear, a factor in which the government is also key. Another form of institutional support is through the incentive from incubators and accelerators, which can allow the development of start-ups because of the cooperation between them and the support of mentors. It seems quite clear that institutions should support start-ups, especially in this sector, where it seems that there is not enough literature and, above all, where there is no mention of public-private collaboration that works so well for the growth of companies. For this reason, questions can be asked for future research:

RQ7: Do sustainable start-ups require the same needs as traditional start-ups when they are supported by institutions?

RQ8: Does institutional support have better results when capital is private, public or mixed?

The research topics proposed above allow us to create an agenda and set guidelines for academics, start-ups and investors. Academics should take advantage of the topics found

to improve the existing literature on sustainability in start-ups, taking into account the speed with which the market evolves and its exponential growth. All the knowledge that is found can then be shared with the other agents of the ecosystem, marking the basis for the start-ups themselves to be able to develop and scale.

Start-ups can use the information extracted from the literature to apply the best processes for their development and should be key in the research carried out by academics. In this sense, they should be proactive and offer all the necessary information because they will be the ones that will mainly be able to satisfy their needs with the acquired knowledge. An important factor to analyse in the future is the benefit obtained by these sustainable start-ups and the comparison with traditional start-ups.

Investors and their capital are the necessary fuel for the scalability of any start-up. In the literature, it can be seen that a change in mentality is needed in reference to sustainability, and if traditional investors cannot do so, new agents should appear in the market. For them, it will be key to be able to determine if in the long term the results of sustainable investments are superior to the traditional investments because it could be the trigger for a change in trend in the market.

This article gives rise to future lines of research regarding the characteristics of investors and entrepreneurs who are committed to sustainable start-ups, on the need for sustainability to be a reality in large companies and in the different management models that should use sustainable start-ups compared to traditional start-ups.

Sustainable businesses will be the future. Researchers, entrepreneurs, investors and institutions must work together to grow businesses, obtain benefits and ensure the existence of future generations.

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