Sustainable entrepreneurship: the scientific production of the 21st century

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ABSTRACT

Sustainable entrepreneurship emerges as one of the economically viable alternatives, with products and processes geared to the creation of solutions allied to social and environmental responsibility. The behavior of this literature arouses increasing interest. Thus, the objective of this study was to analyze the scientific production on sustainable entrepreneurship, on Web of Science, from 2000 to 2016. The categories “Management” and “Business” and the filters “Articles” and “Review” were considered for the study. Thirty articles were identified as “corpus” of research and composed the intentional sample. The results indicate that 2010 and 2011 were the most productive years. Journal of Business Venturing, Impact Factor of 3,678, published seven articles, including the two most cited in this literature. The results allowed identifying, characterizing, report, and classifying this literature. Current and relevant, sustainable entrepreneurship is considered important for the Administration area of study.

KEYWORDS

Sustainable entrepreneurship; Scientific production; Evolution of scientific literature.

RESUMO

Empreendedorismo sustentável emerge como uma alternativa viável economicamente, com produtos e processos gerados da criação de soluções aliadas à responsabilidade social e ambiental. O comportamento dessa literatura desperta crescente interesse. Assim, o objetivo desse estudo é analisar a produção científica de empreendedorismo sustentável, na Web of Science, de 2000 a 2016. As categorias “gestão” e “negócios” e os filtros “artigos” e “revisão” foram considerados para o estudo. Foram identificados 30 artigos como “corpus” da pesquisa e composição da amostra intencional. Os resultados indicaram que 2010 e 2011 foram os anos mais produtivos. Journal of Business Venturing, Fator de Impacto de 3,678, publicou sete artigos, incluindo os dois mais citados nesta literatura. Os resultados permitiram identificar, caracterizar, reportar e classificar essa literatura. Atual e relevante, o empreendedorismo sustentável é considerado importante para a área de estudo da Administração.
1 Introduction

The debate on environmental degradation has gained strength in the last decades. Therefore, the sustainable entrepreneurship emerges as one of the alternatives to face the problem. In Brundtland Commission’s Report, defined sustainable development was as “[…] development that meets the needs of the present without compromising the ability of future generations to meet their needs […]” (Brundtland, 1987, p. 19). With this understanding, the great corporations have been playing their role regarding the mitigation of the environmental degradation, both by public pressure and by the performance improvement, since the eco-efficiency anticipates the rational reduction of resources (Cohen & Winn, 2007). Therefore, the sustainable entrepreneurship is revealed as a solution for the environmental degradation, so that entrepreneurs are able to help the governments reach their goals, through the creation of solutions and innovations leading to sustainability (York & Venkataraman, 2010; Cohen & Winn, 2007; Hall, Daneke, & Lenox, 2010). However, the concept of sustainability is not restricted to the mitigation or environmental problem solving; it embraces many positive actions about social and environmental responsibility in a combination with economic viability. Products and processes geared to the creation of viable solutions allied to the social and environmental responsibility emerge as one of the economically viable alternatives. During the last few years, the incorporation of cultural (Hawkes, 2001), territorial and political (Sachs, 2002) dimension has been discussed as a complement to the Triple Bottom Line, widespread by Elkington (1997). Thus, by developing technologies and new business models, the entrepreneurs focused on sustainability contribute to minimize the environmental degradation and improve the life quality for the benefit of consumers, communities and natural environment (Larson, 2000; Schaltegger & Wagner, 2010; Shepherd & Patzelt, 2011; Pinkse & Groot, 2015). Sustainable entrepreneurship may be understood, from this point of view, as an alternative to change society beyond profit (Schaefer, Corner, & Kearins, 2015).

Concerning the structure of this study, following this introduction, the works that evidence what has been produced about sustainable entrepreneurship were, not exhaustively, reviewed, in order to acquire knowledge about the main findings on this subject. Moving forward, the methodological design and the procedures for data collection and analysis for the accomplishment of the field research were revealed, seeking to ensure the scientific replica. The analysis of results century. It was possible to assume that the sustainable entrepreneurship is an emerging theme under development in the interest area of Administration. Broadening knowledge about the behavior of this literature is of key importance, once this kind of study was constituted of indicative, orientation and scenario of a scientific area. The research question that orientates this study is the following: Which is the behavior of the international literature on sustainable entrepreneurship in the period of 2000 to 2016 on Web of Science (WOS)? Therefore, the objective of the research was to analyze the scientific production about sustainable entrepreneurship, on Web of Science, from 2000 to 2016. In addition, the following specific objectives were defined for this research:

1) To identify, on Web of Science, the scientific production on sustainable entrepreneurship as scientific articles in the categories “Management” and “Business”, and with the filters “Articles” and “Review” applied, in the period of 2000 to 2016;

2) To characterize this scientific production on sustainable entrepreneurship considering the year of publication of the identified articles, the surname(s) and name(s) of the author(s), the title of the article, the number of citations of the article, the title of the journal in which the article was published, and the impact factor of the journal;

3) To report the behavior of this literature, i.e., of the scientific production on sustainable entrepreneurship, from 2000 to 2016;

4) To categorize this scientific production on sustainable entrepreneurship regarding the report presented.
evinced the behavior of the literature on sustainable entrepreneurship from 2000 to 2016. This period evidences the emergence, growth and development of the scientific production of the 21st century about sustainable entrepreneurship. Finally, the conclusion, presenting the final considerations, showed the research limitations and suggested the continuity of studies on this theme.

2 Sustainable entrepreneurship

The entrepreneurship has suffered substantial influence from the environmental issues discussed in world conferences about the environment held since the beginning of the 70’s, for example the Stockholm Conference, in 1973, in which the governments made a compromise to reduce the level of environmental degradation through the creation of attractive mechanisms so that the companies get involved in the actions. Jolink and Niesten (2015) affirm that with the movement started in the 70’s for the adoption of green processes and products, there was a variety of producers, consumers, and citizens committed to the internalization, minimization, neutralization and anticipation of the environmental externalities, creating a new generation of eco-conscious change agents who can be called “eco-friendly entrepreneurs”. The authors classify “eco-friendly” entrepreneurs as a subcategory of sustainable entrepreneurs since they focus on the mass market with aims related to profits and the environment, but with no concerns about social issues. The “eco-friendly entrepreneurs”, as part of the sustainable entrepreneurs, integrated both what needs to be sustained (nature, environment, communities) and what needs to be developed (economic and non-economic gains for the individuals and the society). Therefore, sustainable entrepreneurship is not limited to the solution of environmental issues, it is related to the discovery, creation, and exploitation of businesses opportunities that contribute to the sustainability, generating economic, social and environmental gains for society (Hockerts & Wüstenhagen, 2010; Pacheco, Dean, & Payne, 2010; Shepherd & Patzelt, 2011; Pinkse & Groot, 2015). However, it must be highlighted that sustainable entrepreneurship may not be confounded with social entrepreneurship whose objectives do not remit to profit (Dees, 2001; Dean & McMullen, 2007). Social entrepreneurship is a business process focused on the creation of social value or value for people and communities, prioritizing marginalized and disadvantaged groups; profit is a means to that end (Schaefer et al. 2015). Cohen and Winn (2007) believe that the innovations necessary to the sustainable entrepreneurship will come from entrepreneurs capable of identifying and taking advantage of profitable opportunities whilst facing environmental and social challenges in order to attend the Triple Bottom Line (Elkington, 1997). From this premise, a business can be considered sustainable if it deems the impacts of its activities on society and if seeks to minimize the adverse environmental and social effects on its productive chain. According to Pinkse and Groot (2015), sustainable entrepreneurs have two characteristics that make them more legitimate to express their opinion, on clean energy than the other entrepreneurs. The first, they have more credibility when getting committed to creating new businesses norms, technologies or practices because they are not part of the history of the environmental degradation. The second, they contribute to the sustainability, create social and environmental gains for society and can incite a strong repercussion between the political representatives when approaching the aims of public policies.

Schaefer et al. (2015) have a broader view of the sustainable entrepreneurship and attest that in order to face the challenge of sustainability with prosperity; the companies need to create transnational and non-incremental changes towards sustainability, what involves fundamental changes in the culture of the society and in the collective awareness. This would enable the creation of new collective beliefs and values. The authors also understand that entrepreneurship is a process that can contribute to this transformation because it has the potential to innovate industries, institutions, and societies.

Sustainable entrepreneurship is an emerging theme, with systematic reviews of the scientific production. The most important are: Hall et al. (2010), Levinsohn (2011), Klewitz and Hansen (2014) and Schaefer et al. (2015).

Hall et al. (2010) review has the aim of discussing the emerging research on sustainable development and entrepreneurship. It was held in 2010 for the Journal of Business Venturing special issue. The methodology used was an extensive research about “sustainable development” or “environmental management” and

Revista de Negócios, v. 22, n. 3, p. 22-37, July, 2017.
“entrepreneur/entrepreneurship in peer-reviewed journals. As a result, 1,076 articles were identified, and only 61 were selected; these 61 articles were classified into 29 categories varying from Accounting and Environmental Audit to Hotel and Tourism area. The authors warn that the filter was reduced because as expected in an emerging area, the sustainable development and entrepreneurship basic themes remain inconsistent, and each study has its particularities, but all of them share the interest in understanding what promotes the sustainable entrepreneurship and its importance for politics. They conclude that the sustainable entrepreneurship remains ambiguously defined and controversial, as it emerged influentially for the business, practical and theoretical politics. Beyond the uncertainties that surround this area, the authors conclude that most studies are not published in entrepreneurship journals, and the major part of the literature is more prescriptive than descriptive.

The objective of Levinsohn’s study was to identify the main themes addressed by academic articles and verify if they somehow reflect the controversy around the concept of Sustainable Entrepreneurship (Levinsohn, 2011), according to what Hall et al. (2010) indicated. Online surveys were done through Publish and Perish tool, followed by the complementary research on ISI base, using the expressions “Sustainable entrepreneurship” or “sustainability entrepreneur” and “sustainable entrepreneur”. Forty-two articles treated by the method based on the Critical Management Studies (CMS) were found. Levinsohn (2011) concluded that the branch has been more and more recognized in academic circles and that sustainability, without including social issues, such as poverty and equity, has limited value for the world poorest societies. The results point out that Europe and North America are represented in quantity of authors, especially the United Kingdom and the United States of America. However, there are others exceptionally active, mostly the Netherlands, with publications in German, what may have jeopardized the verification of at least three countries, Germany, Switzerland, and Belgium. They highlight that the sustainable entrepreneurship is characterized by a “green” emphasis, and the terms sustainable entrepreneurship and sustainable development are used interchangeably or inconsistently. Authors endeavor to expand the concept in its original conception, but they dissociate the three dimensions when illustrating with ecological business examples. Therefore, there is a warning regarding the insertion of the concept of sustainable development to entrepreneurship, including its normative character and the importance of the place, what the author calls the fourth element to complete the triple bottom line (Elkington, 1997).

Klewitz and Hansen (2014) made a systematic review of the production on innovation focused on the sustainability of micro and small businesses, seeking to identify gaps and emerging themes. By using 35 keywords, the authors found 84 articles published between 1987 and 2010 in the main research bases. The primary results led the authors to map three kinds of behavior: 1) Variation of resistant, reactive, and preempting, based on the innovation for the rooted sustainability; 2) The innovation practices are presented on product, process and organization levels; 3) The production remains strong on eco-innovation and not on sustainable innovation. The authors built an integrated framework explaining how different strategic behaviors of sustainability can cause contingencies in practical innovations. They concluded that more proactive actions generate radical changes, and proposed that the interaction with external authors may leverage the innovation capacity of micro and small businesses in innovation geared to sustainability. Finally, they identified major research gaps about the innovation focused on sustainability and to the role of micro and small firms in the transformation of the industry and in supply chains. They recommended theoretical debate about the theme since micro, and small businesses are acknowledged as contributors for the sustainable development.

Schaefer et al. (2015) investigate the production about social entrepreneurship, environmental entrepreneurship, and sustainable entrepreneurship, in order to verify in which measure they expressly addressed sustainability as flourishing. From the extensive literature on environmental and social entrepreneurship, the authors at first developed eight preconditions that were grouped into three categories: 1) beliefs/values, 2) diagnosis, and 3) responsibility, which could, over time, bring humankind close to sustainability as flourishing. Next, the literature review was held with no temporal cut from an extensive set of keywords in ABI Inform (ProQuest) and Academic Search Premier

Revista de Negócios, v. 22, n. 3, p. 22-37, July, 2017.
(EBSCO), which are the two most important databases related to business. The research returned more than 700 articles, which after sorting were reduced to 200. The interest was to seek the three kinds of entrepreneurship that embrace the creation of value beyond the economic one. Concerning the works related to sustainable entrepreneurship they bring a real example of sustainable entrepreneurship, related to the American company Native Energy. This firm offers projects by which the corporations can compensate their carbon emission through funding of energy projects, such as wind parks for needy communities. To conclude the research, the authors argue that there is critical reflection requirement about the patterns that shape the business processes for sustainability. Although the authors do not suggest the need to adopt the eight types of conditions, they prioritize the four most urgent and raise research methodological issues to be reviewed and recommend the critical inclusion of the connection conscious for the transformational change for sustainability as flourishing. (Schaefer et al. 2015).

It is also important to emphasize the most recent reviews of literature of Schaltegger and Wagner (2010), Pacheco et al. (2010), D' Silva, Abu Samah, Uli, and Shaffril (2011), Cohen and Muñoz (2015), Schaltegger, Lüdeke-Freund, and Hansen (2016), and Korshgaard, Anderson and Gaddeffors (2016). These works do not analyze the behavior of the scientific production in databases. Consequently, in the face of this confirmation, the interest in critically evaluating the scientific production existing up to now, i.e., from 2000 to 2016, on Web of Science, is justified on more time. With this understanding, the objective of this study is also justified. There is relevance concerning the increase of knowledge about the literature on sustainable entrepreneurship, mainly when the subject is emerging and under development, showing relevance for the study area of Administration.

3 Methodology

The methodological design was defined as exploratory, inductive, documental, and bibliographical because it was sought to analyze the behavior of the literature on sustainable entrepreneurship regarding the scientific production published on Web of Science, from 2000 to 2016. The exploratory research was chosen because this research theme had not been identified, reviewed, systematized, and known in the period defined in this research as longitudinal concerning its scientific behavior, despite the apparent relevance and expanding importance in academia. Thus, it must be explored. The qualitative research was adopted, in turn, to clarify the situations in which the investigated facts take place. It provides reflection to the categorical constructions and content analysis, interpreting the process of the events. The inductive method of analysis supports this understanding since the study object, occurring in parallel to the data collection and analysis, guides it. The design defined here also encompasses the documental research, in which documents compose the analysis base. The scientific article was the material considered “corpus” of this investigation, and it was constituted in the intentional research sample. It was a source and a bibliographical means that presents, communicates and disseminates the results of a certain scientific production, providing report and description of the findings. The scientific article peer-evaluated in the form of blind review and published in international journals with high impact factor, and indexed in databases like Web of Science, is a relevant and important document for study, substantiating the literature of the area of survey.

The literature review, in turn, was based on the bibliographical research. It allowed bringing forward the contributions published in the scientific articles analyzed. The sample was intentional, convenience, seeking to ensure the quality and relevance of the material selected as research “corpus”. Web of Science (2017) was the bibliographical database chosen for this research because of its relevance, reference, and extent concerning the production and disclosure of science. It is worth noting that Web of Science (WOS) is a platform that reunites a set of databases of referential bibliographical information, on the many areas of knowledge. Its importance resides on disclosing bibliographical references and complete texts of articles from international journals, through on-line access. It also provides information about the relationship among articles that cite other articles and the ones that are not cited by them. It enables, therefore, support for studies about the scientific and technological advances in a certain theme, essential for the knowledge about

Revista de Negócios, v. 22, n. 3, p. 22-37, July, 2017.
the development of the community and the scientific production. Web of Science is presented as the most important bibliographic database in the current scientific and technological scenario, and integrates the ISI Web of Knowledge (WOK), once it is associated to the Institute for Scientific Information (ISI). Web of Science enables the generation of metadata including title, authors, year, citations, abstract, impact factor, language, country, research area and type of document. These categories enable the identification and description of the scientific production in a given topic.

The data collection procedures started with the keywords “entrepreneur* and sustainab*”; the star was used to find all the variations of the search words. The Boolean conditioning "and" was used to indicate that it was necessary to find the two terms together and featured in the titles or abstracts of the studies to be identified. The collected data were reunited and typed in an Excel spreadsheet, which generated a graphic of results and provided the presentation of boards showing results. Hereupon, through the discourse analysis, it is understood that discourse is the movement word (Orlandi, 2012). The speech present in the scientific articles analyzed, in other words, the “lines” of the authors were considered concerning the reflection on the structure and generation of the meaning of the text (Gregolin, 1995, p. 20). It considered, thus, aspects, definitions, dimensions, and emphasis presented in the documents. In the process of discourse analysis, there was systematization of what was found as a significant drawing, a framework of the understandable views to apprehend the phenomena studied. Gregolin (1995) it pursued the generation of categories, with broad meaning and that represented an interpretation regarding the general topics addressed in the scientific articles analyzed.

4 Analysis of results

The research findings were gathered according to the order of the specific objectives. Therefore, hereinafter, the first specific aim was presented, focused on identifying on Web of Science, in the categories “Management” and “Business” and the filters “Articles” and “Review”, from 2000 to 2016, the scientific production about sustainable entrepreneurship in the form of scientific articles. Next, the categorization of this scientific production was presented. Then, the behavior conferred by this literature and, finally, the discourse that permeates this literature, as well as the methodological typology of the researches.

4.1 Identification of the scientific production about sustainable entrepreneurship

In this stage, primarily, there was no refinement in the survey of the bibliographical search according to the category (area) and the types of documents (scientific articles and reviews); 220 manuscripts were found. By verifying that a significant part of these studies belonged to the areas of Economy and Social and Natural Sciences, it was opted to consider only the categories “Management” and “Business”, and the studies classified as “Articles” and “Review”, remaining 43 publications only. These choice criteria can be justified because “Management” and “Business” are representative categories of sustainable entrepreneurship concerning the area of administration, and the scientific production in the form of “Articles” and “Review”, in other words, scientific articles are defined as “corpus” of research. They mean reference literature, besides having passed by evaluators and editors of the journals in which they were published. As continuing with the reading of the articles, full text, for the selectivity of the sample, 30 articles that contained the sustainable entrepreneurship in the title, abstract and in the approach discourse were decisively considered. This procedure examined the qualitative aspect of research regarding the reading and interpreting of the titles, abstracts, and full articles. Here, undoubtedly, subjectivism was evinced, when considering interpretation aspects of the findings. The inductive method served as support to what was accomplished. The discourse analysis guided the evaluation procedure of the messages appearing in the texts of this scientific production.

4.2 Characterization of the scientific production on sustainable entrepreneurship

The 30 articles were identified and fully retrieved, online, from Web of Science, in March 2017. They were used to characterize the scientific production on sustainable entrepreneurship. In chronological order, considering the year of publication of the articles identified the surname and name of the author (AU), the title of the
scientific article (TA), the quantity of citations of the article (CI) the title of the journal in which the article was published (TJ), and the impact factor (FI) of the journal. For this purpose, the articles selected from 2000 to 2016 are seen in three boards: the first ten years, i.e., from 2000 to 2009 (including this one), were listed in Table 1. from 2010 to 2013 and Table 2. The last three years from 2014 to 2016 in Table 3. The articles were connected in chronological order of publication. On these boards, there are all the aspects aforementioned, according to the Journal Citation Reports (JCR). The IF is measured through the JCR index that belongs to ISI platform Web of Knowledge, of Thomson and Reuter’s publisher.

**Table 1. Articles on Sustainable Entrepreneurship, published on base ISI, from 2000 to 2009**

| Year | AU              | TA                                          | CI   | TJ                                           | JCR-IF |
|------|-----------------|---------------------------------------------|------|----------------------------------------------|--------|
| 2000 | Farrow, P. H.,  | Entrepreneurship, Innovation, And          | 06   | Interfaces                                   | 0.631  |
|      | Johnson, R R.,  | Sustainability Strategies At Walden Paddlers, |      |                                              |        |
|      | Larson, A. L.   | Inc.                                        |      |                                              |        |
| 2007 | Cohen, B.,      | Market Imperfections, Opportunity And       | 143  | Journal of Business Venturing                | 4.204  |
|      | Winn, M. I.     | Sustainable Entrepreneurship                |      |                                              |        |
| 2007 | Dean, T. J.,    | Toward A Theory Of Sustainable              | 147  | Journal of Business Venturing                | 4.204  |
|      | & McMullen, J.  | Entrepreneurship: Reducing Environmental    |      |                                              |        |
|      | S.             | Degradation Through Entrepreneurial Action |      |                                              |        |
| 2008 | Surie, G.,      | Integrating Pragmatism And Ethics In        | 24   | Journal of Business Ethics                   | 1.837  |
|      | Ashley, A.      | Entrepreneurial Leadership For Sustainable  |      |                                              |        |
|      |                 | Value Creation                              |      |                                              |        |

During this first period, four scientific articles about sustainable entrepreneurship were published. It is worth highlighting Cohen and Winn’s (2007), Dean and McMullen’s (2007) works, the most cited ones. The high quantity of citations indicates the importance of these studies for the literature on this theme. Farrow, Johnson, and Larson (2000), and Surie and Ashley (2008), also published in this period, with fewer citations, according to Table 1.

From 2010, there was an increase in the number of published articles. Only in 2010, the most productive year of the period studied, seven articles were published. Three of which have about 100 citations each: Schaltegger and Wagner (2010), Hall et al. (2010), Hockerts and Wüestenhagen (2010). The other studies were: Kuckertz, and Wagner (2010), Morrish, Miles and Polonsky (2011), Pacheco et al. (2010), Parrish (2010), Rogers (2010), Carayannis, Provance and Givens (2011), De Clercq and Voronov (2011), D’Silva et al. (2011), Peters, Hofstetter, and Hoffmann (2011), Spence, Gherib e Biwolé (2011), Griskevicius, Cantu and Van Vugt (2012), Janssen and Moors (2013). The Table 2 evinces the findings.

**Table 2. Articles on Sustainable Entrepreneurship, published on ISI base from 2010 to 2013**

| Year | AU                     | TA                                          | CI   | TJ                                           | JCR-IF |
|------|------------------------|---------------------------------------------|------|----------------------------------------------|--------|
| 2010 | Schaltegger, S., &     | Sustainable Entrepreneurship And Sustainability Innovation: Categories And Interactions | 110  | Business Strategy and The Environment        | 4.204  |
|      | Wagner, M.             |                                             |      |                                              |        |
| 2010 | Hall, J. K., Danke, G. | Sustainable Development And Entrepreneurship: Past Contributions And Future Directions | 98   | Journal of Business Venturing                | 4.204  |
|      | A., & Lenox, M. J.     |                                             |      |                                              |        |
| 2010 | Hockerts, K., &        | Sustainability Goals Versus Emerging David’s - Theorizing About The Role Of Incumbents And New Entrants In Sustainable Entrepreneurship | 89   | Journal of Business Venturing                | 4.204  |
|      | Wuestenhagen, R.        |                                             |      |                                              |        |
| 2010 | Parrish, B. D.         | Sustainability-Driven Entrepreneurship: Principles Of Organization Design | 58   | Journal of Business Venturing                | 4.204  |
| 2010 | Kuckertz, A., &        | The Influence Of Sustainability Orientation On Entrepreneurial Intentions - Investigating The Role Of Business Experience | 47   | Journal of Business Venturing                | 4.204  |
|      | Wagner, M.             |                                             |      |                                              |        |
| 2010 | Pacheco, D. F., Dean, T.| Escaping The Green Prison: Entrepreneurship And The Creation Of Opportunities For Sustainable Development | 38   | Journal of Business Venturing                | 4.204  |
|      | J., & Payne, D. S.     |                                             |      |                                              |        |
| 2010 | Rodgers, C.            | Sustainable Entrepreneurship In SMES A Case Study Analysis | 24   | Corporate Social Responsibility and Environmental Management | 2.647  |
| 2011 | Carayannis, E. G.,     | Knowledge Arbitrage: Serendipity, And Acquisition Formality: Their Effects On Sustainable Entrepreneurial Activity In Regions | 9    | IEEE Transactions on Engineering Management | 2.647  |
|      | Provance, M., & Givens, N. |                                             |      |                                              |        |
| 2011 | De Clercq, D., &       | Sustainability In Entrepreneurship: A Tale Of Two Logics | 9    | International Small Business Journal          | 1.454  |
|      | Voronov, M.            |                                             |      |                                              |        |
| 2011 | D’Silva, J. L.,        | Towards Developing A Framework On           | 2    | African Journal of Business Management       | 2.215  |
|      | Abu, Samah, B., Uli, J. |                                             |      |                                              |        |
In the last three years, 2014, 2015, and 2016, an increase in the number of articles published, mainly in 2015 and 2016. Eleven studies were published: Cohen and Muñoz (2015), Gray, Duncan, Kirkwood and Walton (2014), Jolink and Niesten (2015), Marshall, McCarthy, McGrath and Claudy (2015), Navickiene, Fominiene and Dias (2015), Pinkse and Groot (2015), Schaeffer et al. (2015), Korsgaard et al. (2016), McMullen and Warnick (2016), Schaltegger et al. (2016), Stal and Bonnedahl (2016). On Table 3, all the authors who were cited in this last period are present. Because they were more recent, they were rarely mentioned.

Table 3. Articles on Sustainable Entrepreneurship, published on ISI base from 2014 to 2016

| Year | AU | TA | CI | TJ | JCR-Fl |
|------|----|----|----|----|--------|
| 2014 | Gray, B. J., Duncan, S., Kirkwood, J., & Walton, S. | Encouraging Sustainable Entrepreneurship Among Threatened Communities: A Samoan Case Study | 1 | Entrepreneurship and Regional Development | 1.629 |
| 2015 | Jolink, A., & Niesten, E. | Sustainable Development And Business Models | 2 | Business Strategy and the | 3.479 |
| 2015 | Marshall, D., McCarthy, L., McGrath, P., & Claudy, M. | Going Above And Beyond: How Sustainability Culture And Entrepreneurial Orientation Drive Social Sustainability Supply Chain Practice Adoption | 2 | Supply Chain Management and International Journal | 2.731 |
| 2015 | Pinkse, J., & Groot, K. | Sustainable Entrepreneurship And Corporate Political Activity: Overcoming Market Barriers In The Clean Energy Sector | 2 | Entrepreneurship Theory and Practice | 3.414 |
| 2015 | Navickiene, R., Fominiene, V. B., & Dias, F. | Entrepreneurship In The Sustainable Tourism Sector: The Case Of Tour Operators In Lithuania | 0 | Transformati ons in Business & Economics | 0.457 |
| 2015 | Schaeffer, K., Corner, P. D., & Kearins, K. | Social, Environmental And Sustainable Entrepreneurship Research: What Is Needed For Sustainability-As-Flourishing? | 0 | Organization & Environment | 2.650 |
| 2015 | Cohen, B., & Muñoz, P. | Toward A Theory Of Purpose-Driven Urban Entrepreneurship | 0 | Organization & Environment | 2.650 |
| 2016 | McMullen, J. S., & Warnick, B. J. | Should We Require Every New Venture To Be A Hybrid Organization? | 4 | Journal of Management Studies | 4.260 |
| 2016 | Schaltegger, S., Ladeke-Friend, F., & Hansen, E. G. | Business Models For Sustainability: A Co-Evolutionary Analysis Of Sustainable Entrepreneurship Innovation, And Transformation | 0 | Organization & Environment | 2.650 |
| 2016 | Korsgaard, S., Anderson, A., & Guddefor, J. | Entrepreneurship As Re-Sourcing Towards A New Image Of Entrepreneurship In A Time Of Financial, Economic And Socio-Spatial Crisis | 0 | Journal of Enterprising Communities -People and Places of Global Economy | NA |
| 2016 | Stal, H I., & Bonnedahl, K. | Conceptualizing Strong Sustainable Entrepreneurship | 0 | Small Enterprise Research | NA |

Hereinafter, the third specific objective of the research was considered, geared to describe the behavior of this organized literature, i.e., the scientific production about sustainable entrepreneurship, from 2000 to 2016, on Web of Science.

4.3 The behavior of the scientific production about sustainable entrepreneurship

The first work documented on Web of Science that associated the two concepts – Revista de Negócios, v. 22, n. 3, p. 22-37, July, 2017.
entrepreneurship and sustainability – was the case study of the authors Farrow, Johnson and Larson (2000). They report the unprecedented experience of a recreational kayak business that was able to harmonize sustainability and product, processes and relationship innovation, summarized as a modern business attitude of its creator. This article counts, up to now, with six citations. After this first study presented in 2000, only in 2007 and 2008 three more works about the theme emerged. In 2009 did not submit publications.

Both articles published in 2007, of the authors Dean and McMullen (2007) and Cohen and Winn (2007) can be considered a milestone of the literature focused on sustainable entrepreneurship and “watersheds” of the theme. Dean and McMullen’s (2007) article points out the relation between the imperfections of the market and the business opportunities in the field of sustainability, in a discussion reasoned on Environmental Economy aligned to the environmental entrepreneurship, protecting the debate concerning the wider concept of sustainability. Cohen and Winn’s (2007) article explains how entrepreneurship can solve the environmental problems of the world socioeconomic systems, demonstrating how market failures can raise opportunities for the sustainable entrepreneurship, through a discussion founded in the Neoclassical Economy, the New Institutional Economy and the Sustainable Entrepreneurship. By making the relations between the theoretical fields and the study object, such authors emphasize environmental and economic issues.

Dean and McMullen’s (2007) and Cohen and Winn’s (2007) articles were the most cited in the literature of this theme, with 147 and 143 citations, respectively, on the date of accomplishment of this research, January 2017. It is important to highlight that the quantity of citation of the referred articles is much higher than the other articles published about this theme on base ISI. There is an apparent increasing reference tendency of these two articles since they became fundamental on sustainable entrepreneurship.

The theme Entrepreneurship associated to sustainability is emergent and has been arousing the interest of the scientific community. It can be verified through the increasing tendency of the citations of the works published in the area, according to Figure 1, which reasserts the assumption of the research.

Notably, the articles researched have been increasingly referenced. For 2017, there is evidence that the citations will remain ascending, once this research was performed at the beginning of January of that year and the references already presented significant numbers. The number of citations is a good indicator that the scientific production related to sustainable entrepreneurship is expanding. When each article was analyzed individually, it was noticed that the ones with more citations were published in 2007. The other manuscripts with a high number of citations belong to Schaltegger et al. (2010), Hall et al. (2010), and Hockerts and Wüestenhagen (2010), with 110, 98 and 89 citations, respectively.

Concerning the scientific production on sustainable entrepreneurship, considering the source of publication, this was disseminated among several journals, according to Figure 2. The major concentration of scientific production was in Journal of Business Venturing, which published the two most cited articles of the base, in 2007, and other five articles about the topic in 2010. The Journal Organization & Environment recently published three articles, two in 2015 and one study in 2016. However, none of these three articles was cited on Web of Science up to this moment.

To summarize it was found that Journal of Business Venturing (JBV) published seven scientific articles. The concentration of five articles in 2010 resulted from a special edition of this journal dedicated to Sustainable Entrepreneurship (Levinsohn, 2011). Out of the five most cited articles on Web Science, four were published by JBV, and the authors were Dean and McMullen (2007), Cohen and Winn (2007), Hall et al. (2010),
and Hockerts and Wüestenhagen (2010). The exception is Schaltegger and Wagner’s (2010) study, published in Business Strategy and The Environment.

Figure 2. Distribution of the publication among the journals in 2017

The other journals that published more than one article on sustainable entrepreneurship were the most productive ones and can be found on Figure 2: Business Strategy and the Environment, Corporate Social Responsibility and Environmental Management, and Journal of Business Ethics. The three articles published, altogether, six scientific articles, two each. In all cases, the publications were made in different years, except that each one of them made available one article in 2011, converging the interest by the topic in that year.

From the publications without any citation or with a small number, except the journals Transformations in Business & Economics and Organization & Environment, all of them are among the greatest impact periodicals. Business Strategy and the Environment, for example, after the publication of Schaltegger and Wagner (2010), presented another one, years later, of Jolink and Niesten (2015). The study received only two citations in the base ISI up to now.

Other studies that receive a good amount of citation were the articles of Kuckertz and Wagner (2010) – 47 citations –, Pacheco et al. (2010) – 38 citations –, and Griskevicius et al. (2012) – 36 citations. The first two were published in Journal of Business Venturing, and the last one, in Journal of Public Policy & Marketing. The following authors have not presented any citation: Navickiene et al. (2015), Schaefer et al. (2015), Cohen and Muñoz (2015), Schaltegger et al. (2016), Stal and Bonnedahl (2016), and Korsgaard et al. (2016).

Overall, the studies had collective authorship. Two and three authors prevail in the articles analyzed. Five authors appear in two articles: 1) Boyd Cohen (Cohen & Winn, 2007; Cohen & Muñoz, 2015); 2) Thomas J. Dean (Dean & McMullen, 2007; Pacheco, Dean, & Payne, 2010); 3) Marcus Wagner (Kuckertz & Wagner, 2010; Schaltegger & Wagner, 2010); 4) Stefan Schaltegger (Schaltegger & Wagner, 2010; Schaltegger, Lüdeke-Freund, & Hansen, 2016); 5) Erik G. Hansen (Klewitz & Hansen, 2014; Schaltegger, Lüdeke-Freund, & Hansen, 2016).

4.4. Categorization of the studies on Sustainable Entrepreneurship

From the 30 most relevant articles, selected by reading the titles, abstracts and articles to identify the adherence to the theme, a discourse analysis was performed, in other words, the analysis of the authors’ “speeches” in the analyzed texts.

The two most cited articles of the field show concern about solving environmental problems through the creation of innovative business models, capable of offering good economic opportunities whilst they act in the mitigation of the environmental challenges, one of the prominent concerns of the recent humanitarian agenda. From the study of eco-entrepreneurs of organic food from the Netherlands, Jolink and Niesten (2015) defined four types of business model for this segment. What the three articles have in common is the focus on sustainable entrepreneurship based on the combination of the economic and environmental pillars. Class 2 has the perspective of approaching the three dimensions of sustainable entrepreneurship allied to the creation of innovative opportunities. In this category are found the second group of most cited manuscripts and the first study in the area, of Farrow, Johnson and
Larson (2000). These authors approach the concept of sustainable entrepreneurship completely through a case study of a manufacturing company of recreational kayaks that implemented an entirely innovative business model, achieving environmental, economic and social benefits. Studies with a high number of citations are down to issues related to the innovation with sustainability, institutional aspects and practical discussion of how entrepreneurs adhere and remain in sustainable businesses. Schaltegger and Wagner’s (2010) work placed sustainable entrepreneurship in relation to the innovation with sustainability, incorporating the social, environmental and institutional contexts, aiming at providing references to managers introduce innovation with sustainability generating sustainable entrepreneurship. They presented a qualitative measuring approach of sustainable entrepreneurship to evaluate the position of a company using a qualifying matrix.

The study of Hall et al. (2010) pointed out the theoretical gap around entrepreneurship focused on sustainability, and the practical difficulty to understand how businesspeople can take the opportunities related to the social and environmental needs concurrently making propositions about the economic, social, environmental and institutional aspects, which must be considered for the construction of this new area of knowledge. Hockerts and Wüestenlagen (2010) presented a new conceptual structure that discusses the contributions of small and big companies for the sustainable development. Propose a model to explain how businesses interact over time since the big companies are seen as more experienced in the innovation of process and the small on in the innovation of products. This interchange is responsible for conducting the entrepreneurship towards sustainability. Pacheco et al. (2010) use the metaphor of the prisoner dilemma or green prison to illustrate the condition of the entrepreneurs for being obliged to act sustainably, without the incentive from the market. The solution proposed by the authors would be the business community change or create institutions, norms, property rights and law to support incentives for competitive games. Pacheco et al. (2010) offer evidence for these business actions. Other studies that have not reached significant number of citations on Web of Science are described in the following: 1) segment of sustainable agriculture (D’Silva et al., 2011); 2) sustainable entrepreneurship in the health area (Janssen & Moors, 2013); 3) urban entrepreneurship and territorial development (Cohen & Muñoz, 2015); 4) entrepreneurship for the sustainable tourism (Navickiene et al., 2015); 5) reflection about the socioeconomic transformation of humankind for sustainability (Schaefer et al., 2015); 6) development of co-evolutionary business models for sustainability (Schaltegger et al., 2016); 7) and entrepreneurial answers to the economic, environmental and socio-spatial crisis through the regional resilience (Korsgaard et al., 2016).

The third category deals with the individual and collective human behavior as a propeller for sustainability. The most cited study of this area is Kuckertz and Wagner’s (2010), who applied the research to students and former students from three universities to measure their entrepreneurial intention and compared to the orientation for sustainability. The authors came to some clear results that the entrepreneurial experience excludes people from their convictions for sustainability. They proposed measures to foment the potential for the sustainable entrepreneurship. These authors follow the thinking that sustainable entrepreneurship arises because of market failures. Griskevicius et al., (2012) use the humanistic approach to examine the evolutive basis of the human behavior, raising five adaptive tendencies of the evolution that explain the environmentally harmful conduct, such as: 1) bias to the own interest; 2) motivation to relative status rather than absolute; 3) propensity to unconsciously copy other people; 4) predisposition to myopia; 5) readiness to ignore intangible concerns. The authors guide marketing professionals and social entrepreneurs to use the advanced human tendencies to reduce or eradicate social problems. Marshall et al. (2015) approach the sustainability culture through empirical research with 156 managers of supply chains of industries in Ireland and conclude that the adoption of the advanced social sustainability supply chain and the entrepreneurial orientation affect and moderate the culture of social sustainability.

The fourth category of studies approaches the dilemma around sustainable entrepreneurship and sustainability so that the authors do not always assume that the streamlining of the resources and the adoption of sustainable practices result in economic gains. For example, De Clercq and
Voronov (2011) proposed to explore the legitimacy conditions that entrepreneurs newly arrived at a sector face for the balance between sustainability and profitability. McMullen and Warnick (2016) discuss the current blend of values that constrain the entrepreneurship, creating conflicts between economic and socio-environmental priority. The most cited articles in these categories are Parrish’s (2010) and Rodgers’s (2010).

Parrish’s (2010) article is characterized by a multi-case study held in four companies of different branches, located in North and Central America, Eastern Africa and Asia-Pacific, rigorously selected. Aspiring to isolate the role played by innovation in the technologies of sustainability promotion, the author raised five organizational principles based on values and motivations of the entrepreneur to obtain successful sustainable businesses. Rodgers (2010) performed a case study focused on the exploitation of the modus operandi of the eco-entrepreneurship, concluding that the eco-entrepreneur SMEs have other goals, working with their financiers, and are willing to make significant efforts to reach such goals. The monetary measures are not absent; they are strongly conditioned by the eco-conscious nature of the business. The studies of Morrish et al. (2011) and Stal and Bonnedahl (2016) appear with few or no citations. The first authors analyzed the open corporations of New Zealand, reaching unsatisfactory results in relation to maturity for sustainability in the local corporative entrepreneurship. The second authors evaluated the Ecological Economy as an alternative base for a “strong” version of the sustainable entrepreneurship, getting to unsatisfied results.

The fifth category is diversified. Includes issues referring to strategy, management of resources, and institutional environment and are structured in case studies and empirical studies. The most cited authors of the category, Peters et al. (2011), conducted comparative case studies on the implantation of strategies of the sustainable supply chain and its relation with the essential inter-organizational resources and identified a range of capacities that enable the creation and establishment of volunteer initiatives of sustainability. The study of Spence et al. (2011) intended to determine the basis of the sustainable entrepreneurship in an international perspective and clarify the potential impact of the economic, institutional and cultural dimensions about the several levels of sustainability in small and medium-sized companies. From the least cited articles on Web of Science, although not least important, Pinkse and Groot (2015) investigate the corporative political activities in the Dutch clean energy sector, found that the sustainable entrepreneurs are politically active, and pursue these activities using collective actions since they face opposition from other industrial entrepreneurs. The authors Gray et al. (2014) studied the acting of a non-governmental organization in the Samoan Islands concerning the help to women and families in vulnerable situations, for the implantation of sustainable businesses. They observed positive results in relation to resilience, sustainability, entrepreneurship and responsiveness to external impacts and risks.

Table 4 presents the categories and the corresponding authors. There, the main groups emerging from the “speeches” and messages of the articles analyzed concerning the discourse object of study, according to the procedures recommended by Gregolin (1995) and Orlandi (2007), were gathered.

| Evaluation of the messages | Authors                                      |
|----------------------------|----------------------------------------------|
| Sustainable entrepreneurship and the economic pillar | Cohen and Winn (2007)                        |
|                            | Dean and McMullen (2007)                      |
|                            | Jolink and Niesten (2015)                     |
| Three dimensions of the sustainable entrepreneurship allied to the creation of innovative opportunities | Farrow, Johson, and Larson (2000)            |
|                            | Hall, Daneke, and Lenox (2010)               |
|                            | Hockerts and Wuestenhagen (2010)             |
|                            | Pacheco, Dean, and Payne (2010)              |
|                            | Schaltegger and Wagner (2010)                |
|                            | D’Silva, Abu Samah, Uli, and Shaffril (2011) |
|                            | Janssen and Moors (2013)                     |
|                            | Cohen and Munoz (2015)                       |
|                            | Navickiene, Fominiene, and Dias (2015)       |
|                            | Schaefer, Corner, and Kearins (2015)         |
|                            | Schaltegger, Ludeke-Freund, and Hansen (2016)|
|                            | Korsgaard, Anderson, and Gaddeforss (2016)   |
| Individual and collective human behavior as propeller element for sustainability | Surie and Ashley (2008)                      |
|                            | Kuckertz and Wagner (2010)                   |
|                            | Griskevicius, Cantu, and Van Vught (2012)    |
|                            | Marshall, McCarthy, McGrath, and Cludy (2015)|
|                            | Parrish (2010)                               |
|                            | Rodgers (2010)                               |
5 Conclusion

Aware of the dynamic, coverage and emergency of the aspects involved with the sustainable entrepreneurship, this study had the aim of analyzing the scientific production on sustainable entrepreneurship on Web of Science, from 2000 to 2016. Web of Science was considered an appropriate database to the carrying out of this study. The literature review promptly showed that the corpus of scientific articles focused on this topic is not large. Authors, who published, most of the times, in partnership, characterizing this authorship as collective, produced these 30 articles. The most cited ones were Dean and McMullen (2007) and Cohen and Winn (2007), considered seminal authors.

Specifically, the most productive journal title on sustainable entrepreneurship was Journal of Business Venturing, which published the two most cited articles of this literature and five other articles in 2010, in the special issue of the journal dedicated to the topic. That special issue contributed to the literature of the theme. Few journals were identified with JCR index below 1,0, what demonstrates that the scientific production on sustainable entrepreneurship consolidates in high Impact Factor journals.

From the analysis performed, it was possible to notice that the area of sustainable entrepreneurship embraces a wide range of possibilities of study application. By nature, both the themes entrepreneurship and sustainability are extensive and transversal, and the joint consideration of the two concepts follows the same range and diversity. The word sustainability is complex and embraces a string of concepts based on the primary pillar of the Triple Bottom Line (Elkington, 1997), and this expression can only be used against the presence and integration of the three dimensions, which may not be dissociated. However, researchers not always present the theme integrating those dimensions. Because it is an emerging area, it is entirely true that researchers from other knowledge areas wish to venture in it, sometimes without any understanding and entire domain of the subject. However, knowing that science is not stagnant and needs multidisciplinary and transdisciplinarity, the contribution of researchers from different areas is considered necessary.

The discourse analysis highlighted five relevant approaches in the articles analyzed:

1) Sustainable entrepreneurship and the economic and environmental pillars;
2) Three dimensions of the sustainable entrepreneurship allied to the creation of innovative opportunities;
3) Individual and collective human behavior as propellant element for sustainability;
4) Dilemma surrounding the sustainable entrepreneurship and social sustainability;
5) Strategy, resource management, and institutional environment.

The researches were focused on the environmental or social contexts. Among the studies analyzed, it was possible to notice that articles grounded in the case study method tend to be less cited. The same happens when the application context differs from business environments and involves places out of the United States of America. Finally, the most cited studies are the theoretical ones, which promote discussion on the topic, offer a critical view, and define concepts and present theoretical or methodological models. Thus, the studies providing literature basis are the most cited ones. Not only because of the theoretical consistency proposed of the scientific contribution, but also because it is related to an emerging study area that still needs a well-established theoretical background. There was a register of a growing tendency of citation in the researched articles, expanding each year. The study showed that this scientific production is under development and being consolidated, and is important as study area of Administration.

The four main systematic reviews performed in the area, of the authors Hall et al. (2010); Levinsohn (2011); Klewitz and Hansen (2013) and Schaefer et al. (2015), got to the conclusion that there is a misconception in the relations established...
between the concept of sustainable entrepreneurship and the empirical researches applied. However, it is important to highlight that there was an increase in the level of the authors’ maturity over time.

Thus, it is possible to affirm, in relation to the research assumption, that this literature is emergent and under development. Concerning the research question, the behavior of the international literature on sustainable entrepreneurship, from 2000 to 2016, on Web of Science, tends to consolidate in the scientific production in the Administration area. The general and specific objectives were met, supported by the methodological design for this research, which was considered appropriate to what was performed.

As for researching limitation, it is possible to point out the use of one database for the bibliographical research of the scientific articles. However, as the chosen database is Web of Science, International, and more relevant, it does not invalidate what was accomplished. Therefore, it is recommended to expand this study.

6 Implications and additional investigations

Researches focused on analyzing the knowledge on a certain literature, with the support of the scientific production published as articles evaluated through blind review, in international journals indexed in Web of Science, are justified theoretically and practically. Theoretically speaking, these researches give opportunities to expand knowledge through the search, identification, selection, analysis, categorization and measuring of a particular area of knowledge. These studies organize the thought, systematizing and getting to know the evolution and meaning of some literature typically disperse and not compiled. They are essential to a scientific community. Likewise, in practice, these studies benefit the people interested in the subject, who are students, professors, researchers, entrepreneurs, government agents, etc. Here, the ones focused on sustainable entrepreneurship. Socializing the findings that compose the object of study, i.e., the international scientific production on sustainable entrepreneurship, they ensure benefits for the subject itself, disseminating its importance for society. The result of this kind of research supports and guides both theoretical and practical actions.

Concerning the theme of sustainable entrepreneurship, it is believed that it will continue growing, once the two issues associated represent the unfolding of conscious capitalism, saving natural resources, with reduction of pollution and environment degradation, and improvement of live quality. Through a better comprehension of what sustainable entrepreneurship is, there will be a possibility to expand the collective awareness and engagement in society, with changes in beliefs and values, and consequently a transformation in the administration of the organizations.

In the face of the importance of the theme, complementary researches on sustainable researches are suggested, considering what was accomplished in this work, with the natural expanding of the study in other international and national databases. The interest by the scientific production on sustainable entrepreneurship justifies this continuity, and it is the expected to deepen the knowledge about the subject.

Likewise, we suggest another research forms and methods that consider qualitative and qualitative data, in the interest of revealing and expanding theoretical and applied studies on sustainable entrepreneurship.

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