Theoretical approaches, supporting actors and their roles in the innovation literature: an analysis from 2009 to 2019

Abstract

The aim of this study was to identify how support organizations to innovation are studied, as well as the influence these organizations have on the development of innovation. Academic production published between 2009 and 2019 were analyzed through Social Network Analysis and Correspondence Analysis techniques. Results indicate that studies on support organizations and innovativeness are mainly based on the Innovation Systems, Networks and Knowledge Management approaches, with emphasis on the interactions among different actors; a significant growth of theoretical basis from the Intermediates point of view was also observed as well as the relevance of the performance of educational and research institutions in the execution of R&D, access to information, and brokerage. In addition, the analysis revealed the important role played by the associative organizations, the scientific / technological parks and the incubators in the cooperation for innovation development and in the intermediation between actors. It was also identified that the training organizations act in the development of technical and managerial capacities; and that public institutions provide access to resources, conduct processes and adapt the institutional environment necessary for the development of innovation.

Keywords: Innovation; Support Organizations; Actors; Support to Innovation

Introduction

Fostering innovation has been a major concern of organizations, which consider it as an aspect that can contribute substantially to organizational performance (Ali, Kan, & Sarstedt, 2016; Sulistyo & Siyamtinah, 2016; Dhanora, Sharma, & Khachoo, 2018). Moreover, it is noted that innovative organizations stand out from others in different capacities (Tajeddini, Altinay, & Ratten, 2017; Lancker et al., 2015). Thus, research has sought to identify capabilities in organizations that promote innovativeness (Sheng, 2017; Urueña, Hidalgo, & Arenas, 2016; Wang et al., 2018). In this sense, studies on governance (Helmers, Patnam, & Rau, 2017), managerial skills (Aarikka-Stenroos et al., 2017), technological capabilities (Sears, 2017), R&D (Homburg et al., 2017).) and governmental political aspects (Zhang & Guan, 2018; Wang et al., 2018) seek to understand the specificities linked to organizations' ability to innovate leading to the maximization of organizational performance.

However, some gaps can be pointed out, especially regarding the manner by which links within the innovation ecosystem are developed and strengthened (Reynolds & Uygun, 2017), the quality of the performance of innovation support organizations (Gorączkowska , 2018) and the comparison of different support actors, such as universities, research / technology organizations, and consultancies (Giannopoulou, Barlatier, & Pénin, 2018).

Although relevant studies have addressed different inter-organizational relationships for fostering innovation (Hung, 2017; Radziwon & Bogers, 2018; Xie, Wang, & Zeng, 2018), investigating interactions with universities (Chen & Lin, 2017; Dnishev, Alzhanova, & Korgasbekov, 2016), research institutes (García-Cortijo, Castillo-Valero, & Carrasco, 2019; Turner et al., 2017), science parks (Xie et al., 2018; Díez-Vial & Montoro-Sánchez, 2015) and other public and private institutions (McKitterick et al., 2016; Parrilli, Aranguren, & Larrea, 2010), few focused on the integrated analysis of different organizations and their connection with the development of innovation. By focusing on this connection, the present study contributes to a better understanding of the role of support organizations in fostering innovation and the aspects that influence innovativeness

This study sought to identify how these support organizations are studied, as well as the influence they have on the development of innovation. To this end, the following specific objectives are presented: to identify which theoretical perspectives are based on the analysis of the actions of support organizations in relation to innovativeness; to identify the most widely studied support organizations; and to identify the support provided by the support organizations on the innovation activity. By focusing on this connection, the present study contributes to a better understanding of the role of support organizations in fostering innovation and the aspects that influence innovativeness.

Considering these objectives, study is structured as follows: initially, the concepts and the theoretical background about support organizations and the capacity for innovation are presented; followed by the methodology where procedures for the selection and analysis of academic productions are explained; in the following section, the results are presented and discussed; in the conclusion, limitations of the study and suggestions for future research are presented.

1. Capacity for innovation and support organizations.

Innovativeness relates to aspects that guide the organization in its quest for innovation (Rubera & Kirca, 2012). In this sense, Lawson and Samson (2001) state that innovation capacity refers to the ability to manage different resources and key competencies that foster the development of innovation.

The term "capacity for innovation" has been used from different points of view. Rugman, Verbeke and Yuan (2011) argue that the term is linked to four categories of competencies, namely: production and operations; marketing and sales; technology; and administrative. In addition, Martínez-Román, Gamero and Tamayo, (2011) present the capacity for innovation based on three branches, namely: knowledge (learning and training, incorporation of new members, research and development); organization (decentralization level, liaison / communication resources, supervision and control, market focus); and human factor (labor training, promotion criteria and rewards, risk taking).

In addition, studies on interorganizational relationships and innovation highlight that an organization's ability to access the different types of knowledge and resources needed for innovation development is influenced by established interorganizational connections (Ahuja, 2000; Díez-Vial & Montoro-Sánchez, 2015).

In this sense, innovation capacity is linked to a set of relationships that allow access to resources and necessary skills (Parrilli et al., 2010; Choi et al., 2011) consequently influenced by the configuration of existent competences and by the environmental set up (Turner et al., 2017). Thus, it is understood that this capacity is enhanced by organizations that support innovation (Choung, Hwang, & Song, 2014; Ayele et al., 2012).

Belso-Martinez et al. (2018) point out the existence of actors liaise between organizations promoting the transfer of knowledge; Watkins et al. (2015) emphasize the role of intermediaries in interorganizational relationships, as well as in access to relevant information, promoting innovative arrangements; McKitterick et al. (2016) highlight the existence of actors who play an important role in the development of informal innovation networks; and Almeida, Figueiredo & Silva (2011) identify the importance of support organizations for research development and technology transfer. Likewise, Choi et al. (2011) highlight the role of different actors in facilitating access to resources, as well as in the interconnection between various organizations, with a view to fostering innovation.

Thus, support organizations, which include universities and research institutes (Etzkowitz, 2016), regional support institutions (McEvily & Zaheer, 1999), associative organizations (Watkins et al., 2015), among others, support the organizational activities, offering collective support services (McEvily & Zaheer, 1999), as well as research

development (Choung, Hwang, & Song, 2014; Sarpong et al., 2017), technology transfer (Dnishev et al ., 2016; Park, 2014), access to information (García-Cortijo et al., 2019), development of technical and managerial skills (Fadden & Gorman, 2016; Doloreux & Melançon, 2009), intermediation between organizations (Choi et al., 2011; Ayele et al., 2012) and various other organizational supports, thus contributing to the development of innovation.

2. Method

In order to identify the scope of studies on innovation capacity as well as the role of support organizations, scientific articles, specifically theoretical-empirical articles, published between 2009 and 2019 were analyzed. Theoretical essays, bibliometric studies and articles published in event annals were excluded from the analysis. As source of academic production, the following databases were used: Science Direct, ProQuest and EBSCO. Figure 1 shows the keywords used for searches in said databases.

Keywords
("supporting organizations" OR "support organizations") AND ("capacity of innovation" OR "innovative capacity" OR "innovation capacities" OR "innovation capacity")
("support institutions" OR "supporting institutions" OR "institutions of supporting" OR "institutions to support") AND ("capacity for innovation" OR "capacity of innovation" OR "innovative capacity" OR "innovation capacities")
"innovation-support organizations"

Figure 1. Keywords used

Three hundred and one scientific articles were found. For the selection of articles, four filters were used. The first filter aimed to eliminate duplicated articles, those without impact factor, those published in event annals, as well as bibliometric studies. Regarding the impact factor, the SJR (Scientific Journal Rankings) index was considered as a measure, i.e., articles published in journals not listed in this ranking were eliminated. Thus, after the first filter, 59 articles were excluded from the analysis.

The second filter aimed to ensure greater rigor in articles selection. Adopted for this this purpose was the Methodi Ordinatio Index (InOrdinatio) proposed by Pagani, Kovaleski and Resende (2015) which classifies articles based on their scientific relevance. This methodology is based on three aspects: journal impact factor, year of publication and number of citations of the article. This index is based on the following equation:

$$InOrdinatio = (FI / 1000) + \alpha * [10 - (YearRes - YearPub)] + (\Sigma Ci)$$

FI - impact factor refers to the quantitatively expressed quality of the journal where the article was published. The Scientific Journal Rankings (SJR) index was used as the basis for the impact factor evaluation of all articles analyzed. This index was chosen over others because it evaluates a larger number of journals on which the selected articles were published.

In order to determine the importance of the element “year of publication” to the articles analyzed, the Greek letter α represents a weight as defined by the researcher, ranging from 1 to 10 (Pagani et al., 2015). For the present study, α was considered equal to 10. In this study, evolutionary analyses of the publications are made.

Ci represents the number of citations of the articles. This measurement was obtained through the Google Scholar page, as was done in the study by Corsi et al. (2019). The bases

on which the articles were searched provide the number of citations, however, each one has its own metrics, causing divergence in the number of citations. As such, Google Scholar provided the number of citations for all articles from the same metric.

From the consolidation of the necessary information, the InOrdinatio equation was applied to each study. Articles with index below 30 were excluded, resulting to a total of 13 exclusions.

The third filter corresponded to the reading of the abstracts; and the fourth, reading the full texts. Based on these two filters, we analyzed the alignment with the objectives of the present study. Three criteria were considered: whether the article was a theoretical-empirical study; whether elements of innovativeness were investigated; and whether it studied aspects related to the performance of support organizations. Based on abstracts alone, 110 articles were deleted; based on analysis of the full texts, 58 more articles were excluded. At the end of the filtering, 70 articles were selected.

Figure 2 illustrates the filtering process and the flow of article selection.

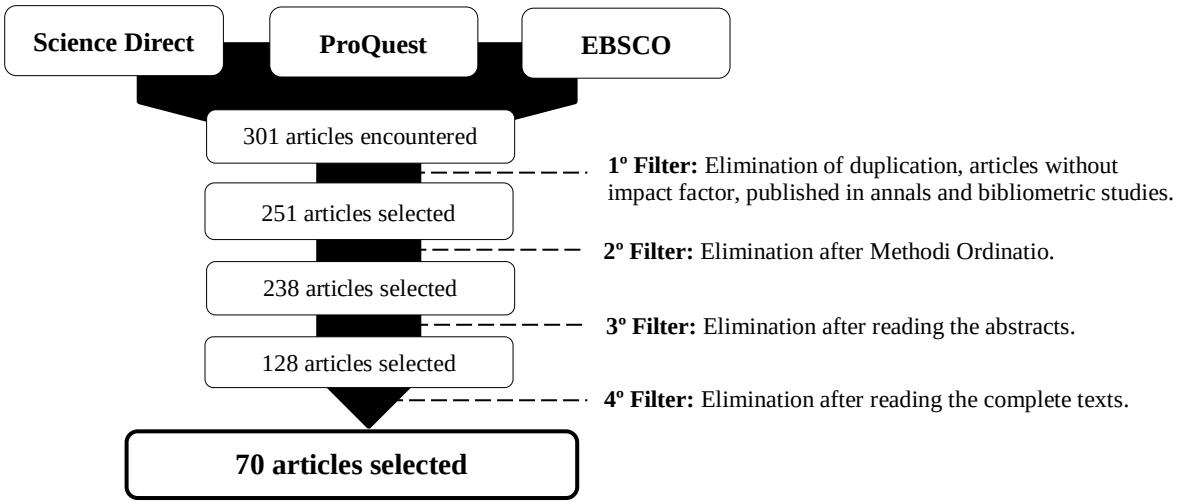

Figure 2. Article selection filter

To identify the evolution of the main theories and theoretical approaches that supported the studies, as well as to map and measure the interactions and flows between them, the Social Network Analysis (ARS) technique was used. For the execution of ARS, following done by Taddeo, et al (2019) and Gomes, et al. (2016), this study resorted to the UCINET software, which makes it possible to analyze the structural properties of existing sets of relationships through important network measures, such as centrality, density, intermediary, among others (Lemieux & Ouimet, 2012). Also, in this study, Degree[1] and Betweenness[2] measures were used, the former expressing the central position of theories and theoretical approaches through direct connections with other approaches; and the second reflects the position of intermediaries they occupy in relation to other theories and theoretical approaches.

[1] Refers to the degree centrality that is measured by the number of nodes (network size of a given actor). χ_{ij} is considered the node value from i to j; **G** is the number of actors in the network, and its maximum value is **G-1**. Thus, the standardization is proposed from the following equation :($\boldsymbol{G-1}$): $\boldsymbol{C' = \sum_j \chi_{ij} / G - 1}$ (Lazega & Higgins, 2014).

[2] Freeman (1979) addressed the concept of Betweenness Centrality, which is the number of times a given node needs another (whose intermediation is being measured) to reach a third node along the shortest path. Thus, if Gij is the number of geodetic paths from i to j, and Gikj is the number of these geodesic paths that go through node k, then the intermediation centrality of node k is given by $\sum_i \sum_j \frac{Gikj}{Gij}, \boldsymbol{i \neq j \neq k}$ (Borgatti, 2005).

Thus, it was possible to identify which theories are most central in the context analyzed and how they are linked.

Moreover, in order to identify associations among the different support organizations and the respective supports identified in the studies, the Correspondence Analysis was carried out with the support of the SPSS software.

3. Results and discussions

Initially, with a view of analyzing the theoretical contexts on which the studies were based, an analysis of the evolution of the different research theories and theoretical approaches on support organizations and innovation is presented in the next topic. Subsequently, in order to identify the main support organizations studied, as well as the respective supports identified in the studies, a specific analysis is made.

Theoretical Approaches

This topic presents how innovation support organizations were studied and the evolution of the approaches used in the selected studies.

Figure 3 illustrates the network formed by the different theories and theoretical approaches that underpin the academic productions analyzed in the present study. The analysis of this network enables the identification of the main theoretical bases as well as the relations among them. In addition, it makes it possible to identify those that are most central and representative in studies of supportive organizations and innovativeness.

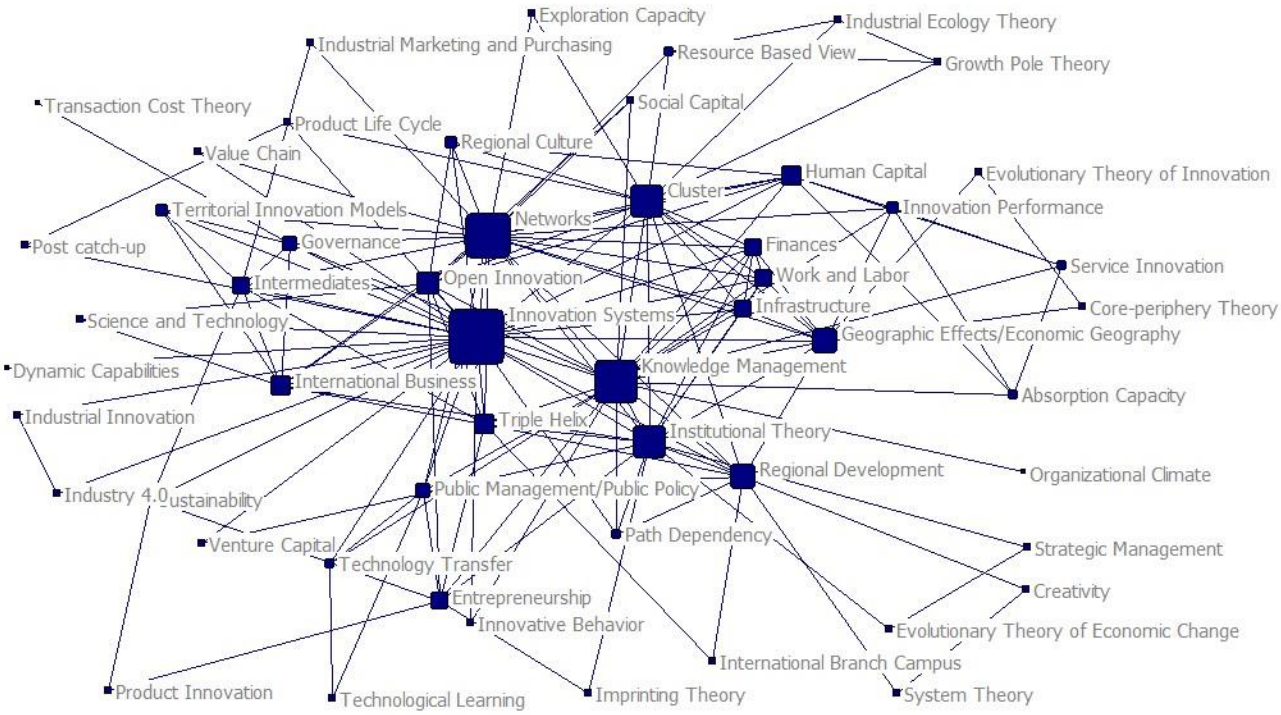

Figure 3. Theories and theoretical approaches

Based on the Degree measure, which reflects the actor's central position through direct network connections (Lemieux & Ouimet, 2012), it was verified that the theoretical approaches that presented more expressive centrality levels in relation to the set of theories and approaches which supported the studies were: Innovation System, Networks and Knowledge Management.

The Innovation System approach was present in 55.7% of the analyzed articles. This approach consists of national (NIS), regional (RIS), sectoral (SIS) and technological (TIS)

innovation systems (Martin, 2012). It involves, in different analytical spheres, the role of multiple actors (including support organizations) who interact and contribute to the development of different innovations (Mowery & Oxley, 1995; Malerba, 2009; Bergek et al., 2015).

The Networks approach, in turn, emphasizes the study of social and interorganizational arrangements and relationships (Gilsing et al., 2008; Gulati, 1998), as well as the dimensions of the network, which include direct and indirect ties and connections, which can influence innovation promotion (Ahuja, 2000). As a result, the network provides the link between different actors, and this link can be promoted by support organizations (Watkins et al., 2015; McEvily & Zaheer, 1999) facilitating access to resources and information towards innovation development (Cui, Fan, Guo, & Fan, 2018; Peng & Luo, 2000).

Knowledge Management addresses how knowledge can be created, acquired, integrated, applied and disseminated organizational contexts to enhance innovation (Mardani et al., 2018; Huang & Li, 2009). In this sense, support organizations can play roles that relate to knowledge generation and transmission (Pelkonen & Nieminen, 2016; Doloreux & Melançon, 2009; McKitterick et al., 2016) needed for development of innovation (Doloreux & Lord-tarte, 2014; Zhang & Hartley, 2018).

As a way of analyzing the evolution of the centrality of multiple theoretical approaches, the publications were divided into two periods - those published between 2009 and 2014 and ones published between 2015 and 2019. This division aimed to balance the amount of studies covering both periods, the former composed of older publications and the latter by more recent publications. 35 articles integrated each period.

For the analysis, the degree centrality measures were used (specifically, the nDegree indicator was used instead of the Degree measure, because it represents the normalized degree of centrality, considering the maximum values), and Betweenness which reflects the intermediate position that actors (in this case the theoretical approaches) occupy in the network, according to Lemieux and Ouimet (2012). This made possible the identification of the diversification of different theoretical approaches in the analyzed studies.

Table 1 presents the measurements of the two periods, as well as the variation of these measures in the approaches that presented the main results.

		2009 – 2014		**2015 – 2019**		**Variation**	
	Theories and Theoretical Approaches	***nDegree***	***Between.***	***nDegree***	***Between.***	***nDegree***	***Between.***
1	Innovation Systems	0,803	113.167	0,459	315.417	**-0,344**	**202.250**
2	Networks	0,492	59.767	0,393	237.017	**-0,099**	**177.250**
3	Knowledge Management	0,443	101.883	0,311	167.350	**-0,132**	**65.467**
4	Regional Development	0,115	54.000	0,197	76.967	**0,082**	**22.967**
5	Intermediaries	0,033	0,000	0,164	12.667	**0,131**	**12.667**
6	Cluster	0,246	12.933	0,164	75.733	**-0,082**	**62.800**
7	Institutional Theory	0,246	3.183	0,148	155.550	**-0,098**	**152.367**
8	Public Management	0,016	0,000	0,131	28.767	**0,115**	**28.767**
9	Governance	0,082	28.000	0,082	0,000	**0,000**	**-28.000**
10	Triple Helix	0,164	19.533	0,082	9.083	**-0,082**	**-10.450**
11	Open Innovation	0,213	29.617	0,066	4.983	**-0,147**	**-24.634**
12	Geographical Effects	0,230	3.750	0,066	76.000	**-0,164**	**72.250**
13	Entrepreneurship	0,098	80.000	0,033	0,000	**-0,065**	**-80.000**

Table 1. Centrality Measures (Theories and Theoretical Approaches)

In both periods, the Innovation Systems, Networks and Knowledge Management approaches presented the most expressive measures of centrality although the nDegree results of these approaches had declined. Also notable is the evolution of both nDegree and

Betweenness measures from the following theoretical approaches: Regional Development, Public Management and Intermediates.

In order to illustrate the evolution of the centrality of the theories and theoretical approaches listed in Table 1, the crossover of the variation of the different theoretical approaches based on the nDegree and Betweenness measures is shown in Figure 6.

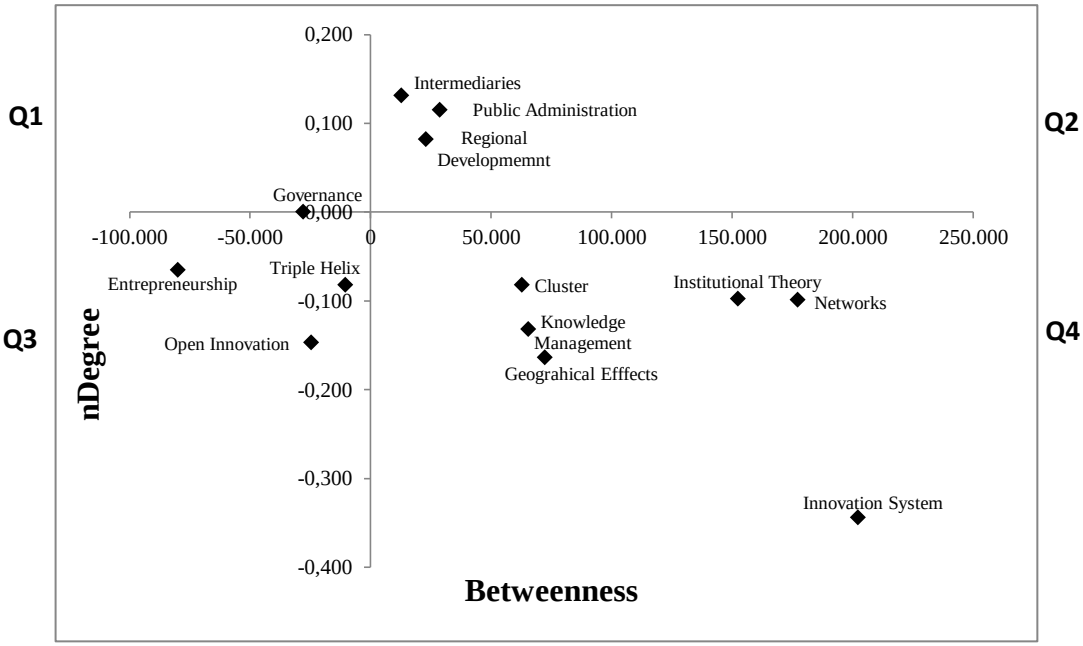

Figure 6. Theoretical Approaches Centrality Quadrants

Given that the nDegree measure represents the direct connections and that Betweenness expresses the intermediation between actors, which are in a position that others need to connect to third parties (Lemieux & Ouimet, 2012), it is inferred that the theoretical approaches with higher nDegree results are directly linked to a larger number of other approaches, and those with higher Betweenness results have diversified more expressively. Thus, it is understood that the Q1 quadrant is composed of theoretical approaches with increasing number of theoretical connections, but with low diversification in the studies. Q2 refers to the quadrant with increasing number of connections among theoretical approaches and with wide diversification among them. Q3 refers to the quadrant with reduced theoretical interest. Q4 represents the quadrant with theoretical connections reduction but with a growing diversification of these approaches.

Therefore, it is inferred that Q2 incorporates the theoretical approaches with increasing expansion of the theoretical interest, and that Q4 encompasses the theories and theoretical approaches already consolidated but with the intention of the researchers to approach them from different perspectives. Thus, Q2 manifests the evolution of centrality of the theoretical approaches of the analyzed studies. It is observed that there has been a significant growth in the interest of analyzing innovation support organizations from the perspective of regional development, public management and intermediaries.

Supporting organizations and the support exercised

This topic presents the analysis of the main support organizations studied, the identified supports, and their relationships. Based on the studies analyzed, different types of support organizations were observed. Figure 7 shows the organizations analyzed in the

surveys and the proportion of studies that investigated each organization at two different periods (2009-2014 and 2015-2019).

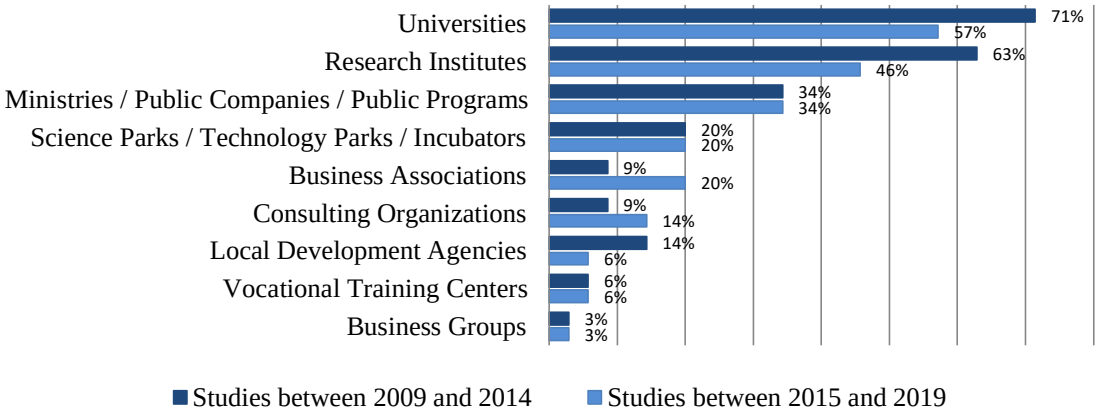

Figure 7. Support organizations

The main support organizations analyzed in the studies were: universities, research institutes, public institutions (ministries, public companies and public programs) and science / technology / incubator parks. However, there was a decrease in the number of studies on universities and research institutes. In contrast, there has been a significant growth in studies on business associations and consulting organizations.

As a complement, we sought to identify the most observed support systems in each support organization studied. Towards this end, the Correspondence Analysis, using the SPSS software was realized. This analysis was made through the categorization of the different support organizations, as well as the respective supports identified in the studies.

In Figure 8, the different support organizations studied, and their respective categories are expressed. Similarly, Figure 9 shows the media identified in the studies and the corresponding categories.

Support organizations	Categories
Universities and research institutes	*Educational and Research Inst.*
Science Parks, Technology Parks, Incubators	*Innovation Poles*
Ministries, Public Enterprises, Public Programs	*Public Institutions*
Consulting organizations	*Consulting Organizations*
Vocational Training Centers	*Training Organizations*
Business Associations and Entrepreneur Groups	*Associativity Organizations*
Local Development Agency	*Local Development Organ.*

Figure 8. Categories of support organizations

Functions and support	Categories
Research, Product Development, Patenting	*R&D*
Brokerage, Knowledge Transfer, Technology Transfer, Representation	*Brokerage*
Professional Development, Management Skills Development,	*Technical/Managerial Capac.*
Institutional Security, Regulation, Legalization	*Institutional Environment*
Access to Resources	*Resource Access*
Source of Information	*Access to Information*
Cooperation / Collaborative Relations	*Cooperation*
Process Conduction	*Process Conduction*

Figure 9. Support categories

It is worth noting that the "R&D" category is composed of elements that involve the execution of basic or applied research and the use of knowledge generated for the development of new products (Jensen, Menezes-Filho, & Sbragia, 2004). In addition, the category labeled "Brokerage" integrates functions that refer to relationships involving at least three actors, including the intermediary, which has the role of linking parts of the transaction (McEvily & Zaheer, 1999). In the case of the "Technical / Managerial Capacity" category, aspects related to the development of managerial, operational and technical efficiency required for innovation development are integrated (Zawislak, 2013). In the category "Institutional Environment", there are elements related to the perspectives suggested by Oliver (1997) which include factors related to institutional norms, regulations, control, legitimacy and political-legal environment. Finally, there is no integration of functions in the other support categories.

When relating the categories of support organizations (Figure 8) with the identified support categories (Figure 9), the value found for chi-square was $\chi 2 = 128.283$, with a degree of autonomy equal to 42 and significance $p = 0.000$. Based on this result, there is an association between the categories of support organizations and identified supports. Regarding total inertia (total variance), the result was 0.588. Thus, through the model tested, the categories of support organizations explain 58.8% of something about the identified support categories.

For a better visualization of the relationship between the two categories analyzed, Figure 10 presents the map developed with two dimensions and the symmetric standardization method. According to Hair (2010), there is a similarity between the points when there is an approximation between them. Thus, the blue dots represent the categories of support organizations and the green dots represent the categories of support identified. It is noted that there are four groupings, two of them (I and II) are close and, together, possibly cover one of the identified supports (Brokerage).

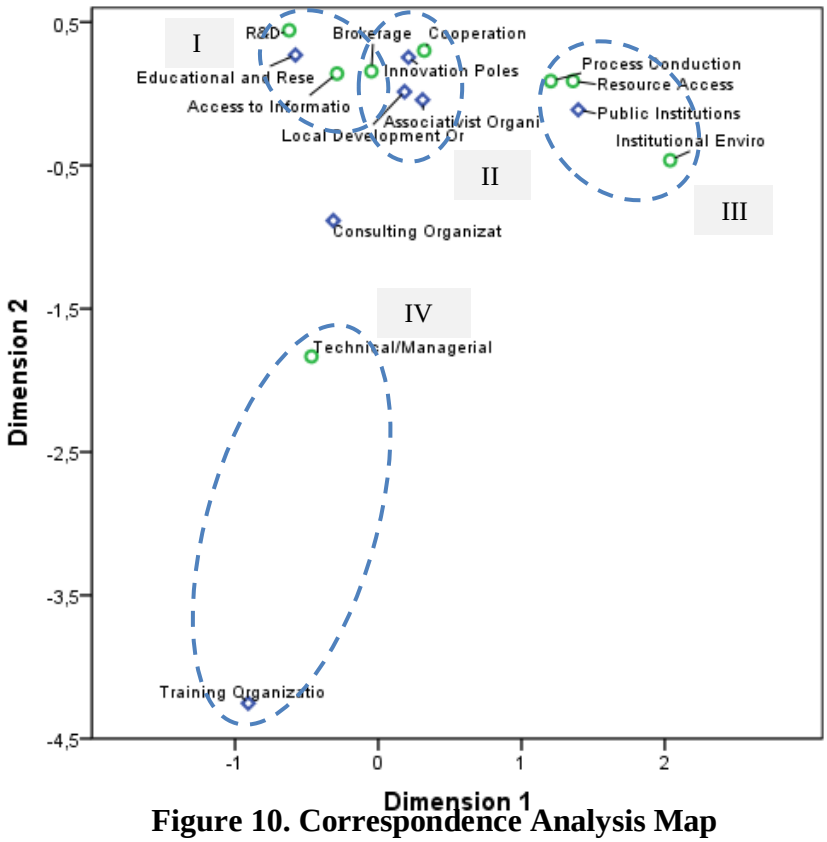

Figure 10. Correspondence Analysis Map

The following table reproduces the groupings shown in Figure 10 from the categories of support organizations and their identified supports.

Grouping	Support organization category	Support
I	• Educational and Research Inst.	• R&D • Access to Information • Brokerage
II	• Innovation Poles • Local Development Organ. • Associativity Organizations	• Cooperation • Brokerage
III	• Public Institutions	• Resource Access • Process Conduction • Institutional Environment
IV	• Training Organizations	• Technical/Managerial Capac.

Figure 11. Consolidation of Correspondence Analysis Groupings

Educational and research institutions such as universities and research institutes, as indicated in group I, strongly support R&D activities and promote access to information, which is one of the most relevant elements for innovation activity (Zhang & Hartley, 2018; Xie, Zeng, Peng, & Tam, 2013). In addition, they act in the brokerage process, intermediating different organizations, with significant relevance in the transfer of knowledge and technologies (Exposito-Langa, Tomás-Miquel, & Molina-Morales, 2015; Dnishev et al., 2016). indispensable for the development of innovation (Lv & Qi, 2019; Doloreux & Lord-tarte, 2014).

The innovation hubs as well as local development agencies and associations are part of group II. The representativeness of these categories of organizations can be observed in the cooperation for innovation development and in the intermediation between two or more organizations. These are relevant aspects as isolated organizations have some difficulty in innovating so that cooperation between different types of partners maximizes the possibility of obtaining ideas and resources through external channels (Lv, 2014). In addition, the role of intermediaries in the brokerage process provides organizations with access to unrelated actors directly enabling the transfer of resources and knowledge needed for innovation (Kanda et al., 2019; Schilling, 2017).

Group III expresses the relevance of public institutions in terms of access to resources, process management and the enhancement of an appropriate institutional environment needed for innovation. In this sense, these organizations play an important role in the development of innovation since this capacity is directly linked to access to resources (Lawson & Samson, 2001). Notably, innovation organizations are influenced by the adequacy and quality of the institutional environment, especially regarding political stability, institutional image and regulatory quality (Wu, Wu, & Zhuo, 2015; Allard et al., 2012; Heredia Pérez et al., 2019).

Finally, according to group IV, the training organizations are related to the technical / managerial capacity; and, in this sense, these organizations support companies in the area of management, technological development and the different technical specificities needed to carry out innovation activities (Küçüksayraç, Keskin, & Brezet, 2015; Kanda et al., 2019; Coque , González-Torres, López-Mielgo, & Vázquez, 2014).

It should be noted that the category of consulting organizations is in an intermediate position between groupings I, II and IV, suggesting that these organizations support both technical / managerial capacity and access to information and act as brokers between different organizations.

To identify the evolution of the support provided by the support organizations, figures 11 and 12 show the Map of Correspondence Analysis for the scientific production published between 2009 and 2014 and between 2015 and 2019. The roles of support organizations in more recent periods compared to previous performance are analyzed.

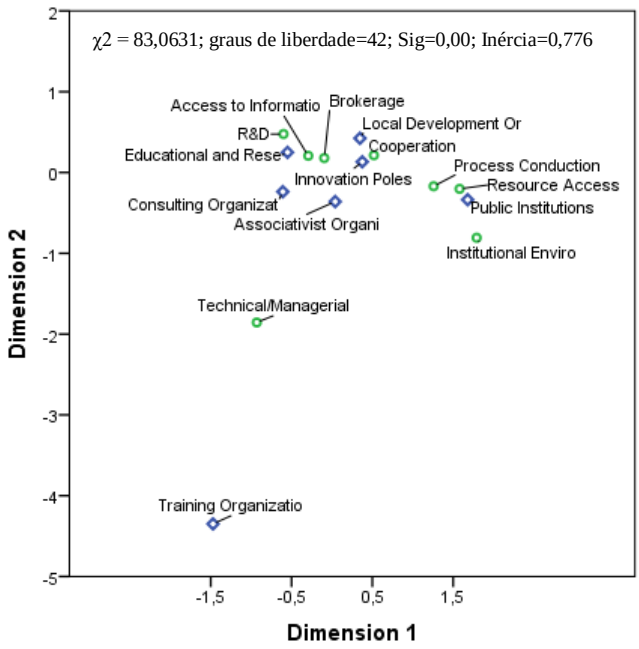

Figure 12. ANACOR map - 2009 to 2014

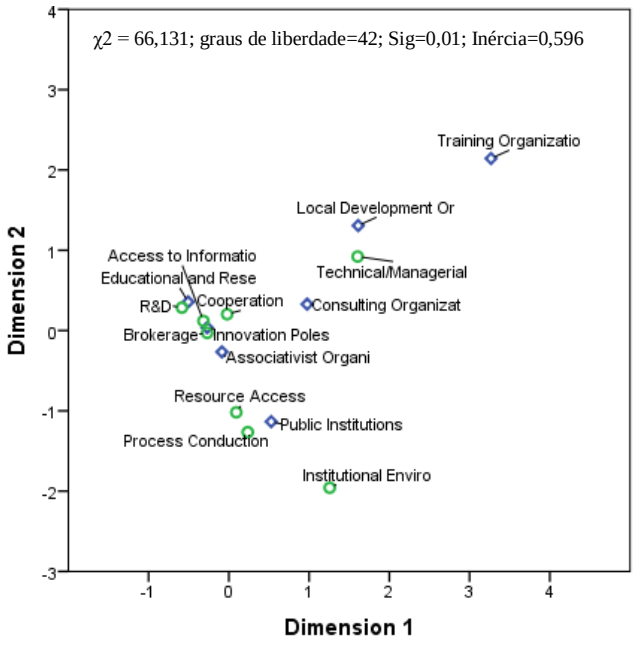

Figure 13. ANACOR map - 2015 to 2019

From the two models tested, it is established that, in both periods, there is a link among support organizations categories and the different supports identified. The explanatory power of the first model is higher, however, in both models there is a statistical significance and explanatory power greater than 59%.

When comparing the two correspondence maps, it is observed that the Educational and Research Institutions, the Innovation Poles, the Public Institutions and the Training Organizations maintained their functions; however, there were changes in the role of local development organizations, which at first acted in cooperation and intermediation between organizations, and later became more expressively linked to the development of Technical / Managerial Capacity.

Conclusion

Through the analysis of theoretical approaches that support the studies on support organizations and the capacity for innovation, it was observed that there was a prevalence of the following theoretical approaches: Innovation System, Networks and Knowledge Management. These approaches were central and focused on interactions among different actors (including support organizations) in order to enhance the linkages and access to different resources needed for innovation development. In addition, it should be noted that the theoretical basis on intermediaries has been increasingly important in studies of support organizations and innovativeness, with emphasis on achieving connections between non-directly related actors, facilitated through intermediation activity.

Regarding the different support organizations, there was a predominance of studies that analyzed the role of universities, research institutes, public institutions and scientific / technological / incubator parks for the development of innovation, highlighting the evolution of research that analyzed consulting organizations and business associations.

The study reveals several types of support offered by support organizations to the innovation process. Educational and research institutions act mainly in the execution of Research and Development (R&D), besides providing access to information, and acting as brokers among different actors. In addition, it was possible to identify that associative organizations, science / technology parks and incubators play an important role in cooperation for innovation development, as well as acting as intermediaries between organizations. It was also identified that the training organizations act in the development of technical and managerial capacities. Finally, it was observed that public institutions provide access to resources, in addition to acting in the conduction of processes and adaptation of the institutional environment necessary for the development of innovation.

Limitations

It is important to note that the present study was limited to 3 databases used to access the articles. In addition, publications from 2009 to 2019 were considered. Possibly these two factors limited access to other articles related to the present study.

Suggestions for future studies

Based on what was presented in this study, the following suggestions are proposed,: that future studies broaden the investigation on the role of consultancy organizations and vocational training centers on the intermediation of resources for innovation; supporting organizations not included in this study, such as accelerators, coworking and private funding organizations be studied in relation to their role as intermediaries in resource transfer for innovation; analyze the moderation of internal R&D activity on the transfer of resources for innovation; and investigate the role of support organizations in the transfer of resources for innovation in the specific context of cooperative organizations.

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