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INNOVATION DEFINITION IN SCOPE OF BRAZILIAN RESEARCH: A SEMANTIC ANALYSIS

DEFINIÇÃO DA INOVAÇÃO NO ÂMBITO DA PESQUISA BRASILEIRA: UMA ANÁLISE SEMÂNTICA

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ABSTRACT
Considering the need of the Brazilian Public Universities to locate and position themselves in relation to the political and economic investments that have been received to become the locus of production of Innovation, it is the objective to investigate, in the scope of Brazilian scientific research, which understandings, or what definitions of Innovation have been adopted or constructed in different areas of knowledge, highlighting the field of Information Science (IS). Thus, the objectives of the research are: to analyze the definitions of Innovation presented in Brazilian theses and dissertations, identifying the predominance of Innovation conceptions in these researches. For this, a descriptive and exploratory research was developed, using textual mining methods and semantic analysis through KhCoder software, in the texts of Brazilian theses and dissertations on the subject. The data is essentially national, using the database of the Digital Library of Theses and Dissertations. Based on the collected data, we sought to reflect on the multidisciplinary perspectives of Innovation presented in scientific research that could be assumed by Public Universities to better understand their vocation for Innovation. With the results obtained, it was possible to identify "Technological Innovation" as the most predominant conception in Brazilian research, as well as the definition of Innovation tending to the business aspect and its underlying definitions, which corresponds to the high centrality of the Administration's knowledge area in the speeches of Innovation.

KEYWORDS
Innovation. Brazilian research. University.

RESUMO
Tendo em vista a necessidade das Universidades Públicas brasileiras de se localizarem e se posicionarem em relação às investidas políticas e econômicas recebidas para se converterem em lócus de produção da Inovação, se objetiva investigar, no âmbito das pesquisas científicas brasileiras, quais os entendimentos, ou ainda, quais as definições de Inovação têm sido adotadas ou construídas em diferentes áreas de conhecimento, dando destaque ao campo da Ciência da Informação (CI). Assim, são objetivos da pesquisa: analisar as definições de Inovação apresentadas nas teses e dissertações brasileiras, identificando as predominâncias sobre concepções de Inovação nestas obras acadêmicas. Para tanto, foi desenvolvida uma pesquisa descritiva e exploratória, empregando métodos de mineração textual e análise semântica por meio de *software KhCoder*, nos textos das teses e dissertações brasileiras sobre o tema. O recorte dos dados é essencialmente nacional, utilizando a base de dados da Biblioteca Digital de Teses e Dissertações. A partir dos dados coletados procurou-se refletir sobre as perspectivas multidisciplinares da Inovação, apresentadas em pesquisas científicas, que poderiam ser assumidas pelas Universidades Públicas para um melhor entendimento de sua vocação para a Inovação. Com os resultados obtidos, foi possível identificar a "Inovação tecnológica" como a concepção mais predominante nas pesquisas brasileiras, assim como a definição de Inovação tendente ao aspecto empresarial e suas definições subjacentes, o que condiz com a alta centralidade da área de conhecimento da Administração nos discursos de Inovação.

PALAVRAS-CHAVE
Inovação. Pesquisa brasileira. Universidade.

1 Introduction

In view of the need for public universities to locate and position themselves in relation to the political and economic advances received in order to become the locus of innovation production, it was aimed to investigate, within the scope of Brazilian scientific research, what are the understandings, or still, which definitions of Innovation have been adopted or built in different areas of knowledge, emphasizing the understanding presented in the field of Information Science (IS), understanding this field as strategic in the process of mediation in Innovation processes. The hypothesis that circumscribes the development of this multidisciplinary analysis[1] is that Innovation, understood primarily as the process of knowledge production, products and services, would be the object of investigation and problematization in different contexts. From this, the implementation of unilateral Innovation policies in Higher Education can be a great challenge.

This potential variation on the definitions of Innovation, which would be revealed in the areas of knowledge in which it is being problematized, could subsidize the Brazilian Public Universities in understanding the multiplicity of definitions assumed as research objects, and thus, to understand more broadly the challenges. that are placed with these public higher education institutions when they are encouraged to position themselves in the Innovation production chain in the country.

Some paths can be presented to situate the discussion about the place of the Brazilian University in the Innovation scenario, such as: from the Federal Constitution of 1988, when the national science, technology and innovation system was established, already foreseeing the collaboration of the public / private sectors; from Law No. 10,973 / 2004 (Law of Innovation), from which Public Universities assume the strategic place in the production of research for this purpose; Decree No. 5563/2005, in which the relationship between the public and private sector is now being stimulated (as an example, investments were made in the creation of NITs [Technological Information Centers] to assume this function of relating science, technology and innovation); and Law No. 13,243 / 2016 (which adjusts the Innovation Law), assigning more actions in Public Universities as agents of this process (BRASIL, 2004; BRASIL, 2016).

[1] The assumed understanding about the epistemology of interdisciplinarity and the concept of multidisciplinarity was supported by SILVA, M. D. P .; GRACIOSO, L. S. (2018).

On the other hand, the constitution itself presents the "Principle of University Autonomy", both in relation to its supporting resources, and in relation to the teaching and research practices it conducts[2].

In this scenario, the question is: What has been assumed as a definition of Innovation in Brazilian research and how has IC been circumscribed within its scientific production? In order to answer this question, it is necessary, as a theoretical basis, to be clear about the definitions of Innovation present in the documents that regulate this process globally (Oslo Manual, Global Innovation Index and Frascati Manual), to analyze the concepts of Innovation published by national researchers. and international ones dedicated to the theme (Schumpeter; Potter and Cunninghan; Freeman; Mowery and Rosenberg, mainly), and present the current developments of Innovation as Open Innovation, Social Innovation, Sustainable Innovation, among others. From this, the following specific objectives were established: a) identify the Brazilian theses and dissertations that assumed Innovation as the object of investigation; b) locate and systematize the definitions of Innovation presented in these researches; c) identify, describe and relate the conceptions of innovation assumed in these researches; d) reflect on the possible ways of multidisciplinary understanding of Innovation in the context of Brazilian Public Universities.

The methods used to identify sources of information that support the theoretical construction were: bibliographic and documentary research. For the identification of theses and dissertations on Innovation, the Brazilian Digital Library of Theses and Dissertations (BDTD) was consulted exclusively. For the systematization and analysis of the concept of innovation in these researches, the natural language processing software (KHCoder) was used.

In the field of Information Science, it is intended that this research can contribute to analyzes that favor the understanding of the area about the complexity of what has been presented as Innovation in Brazilian research, since CI is a strategic agent in structuring and social consolidation of Innovation processes. In a more localized way, this research is justified because it is being developed within the UFSCar Graduate Program in Information Science (Federal University of São Carlos), which defines as concentration: "Knowledge, Technology and Innovation", dealing with is the only Brazilian PPGCI, so far, which provides for Innovation as a focus area. Also, this Program is the only UFSCar PPG with such focus as a concentration area (SILVA, 2018).

[2] But always passing through the scrutiny of the control organs as the Comptroller General of the Union (CGU), Court of Accounts of the Union (TCU), Attorney General of the Union (AGU) and Federal Prosecutor (MPF).

2 Conceptual Challenges of Innovation

Innovation is a concept widely discussed in all contexts, as it is considered as driving the development of nations, even if one still wonders what this "development" would be. But it is a fact that the assimilation of the elements of information and knowledge by the human being is essential for the generation of new knowledge, products or services - considered by some scholars as the "engine of the modern economy". The word Innovation has several definitions and changes according to the context in which it is used, and thus there is no consensus on its meaning by the authors who seek its definition. Innovation, in a general way and without even sticking to scientific definitions, is related to what is new, what has been improved and is connected to science, technology and invention.

The term *Innovation* originated from the Latin term "Innovare", which means "renew, change", where "*in*" stands for "in" which means "new, recent". According to the definitions in the Caldas Aulete *Online* Dictionary, the terminology Innovation refers to the "action or result of innovating", ie, it is an intention to want to change something usual, providing novelties and varieties to a particular product, service or process. This does not refer to the invention as the creation or development of something that did not exist before, but the improvement or change of something that already existed.

Innovation and development are intertwined concepts. Taking for development the concept of the Indian researcher Amartya Sen, which, according to Kang (2011), is a notorious reference, whose ideas formed the Human Development Index (HDI), constituted by the United Nations Program, one has to,

> Development is the removal of various types of imprisonment that leave people with little choice and little opportunity to exercise their rational agency. The removal of substantial prisons, it is argued here, is constitutive of development (SEN, 1999, p. 12).

Papaioannou (2016, p. 310) sees this intertwining also in Sen's light and interprets that, for the theorist, the vision of social change is based on the equalization of capacities, both in the generation and distribution of innovation, reporting that "the approach Sen-based capabilities are informative. [...] Sen puts innovation and development at the service of freedom for valuable individual workings."

An example is Medellin in Colombia, which went from one of the most violent cities on the planet to its peak in 1991, when, among the causes of mortality, 42% were homicide events (CARDONA et al, 2005, p. 840), for a model city, as presented in *Exame* Magazine by editor Sant'Anna (2017), published October 5, 2017,

> In 2013, Medellin was named City of the Year in a contest held by The Wall Street Journal and Citibank Bank, in partnership with the US Urban Land Institute. [...]. Medellin has been regularly standing out in the international innovation rankings - and in front of the major Brazilian capitals (SANT'ANNA, 2017, *online*).

A sample of how to think about the functioning of Amartya Sen's capacities appears in the engagements seen in Medellin's restructuring plan, in which public communication was strengthened "[...] inserting communication as a central sphere of public policies" (OLIVEIRA, 2011 , p. 172), in addition to other integrationist projects, even in the context of urban architecture, such as Entrepreneur's Culture, Participatory Budgeting, Social Urbanism, Integral Urban Projects (PUI) and Inclusive Medellin. The PUIs "tried to make public policies converge in these zones" (ECHEVERRI, 2017, p. 7), that is, in areas of greatest social difficulty and lower HDI, acting under implementation strategies such as housing projects, cable cars, Library Parks, as well as a redevelopment of the walking streets.

Another punctual understanding is Innovation from the perspective of the early twentieth-century economist Joseph Schumpeter, who appropriates the "old" to make it new, is a process called "creative destruction," in which recent innovations They replace the older ones and it is this action that generates the economic boom - an innovative entrepreneur is imitated by other non-innovative entrepreneurs who invest resources to develop the goods developed by the former, launching news in the market. Faced with this reshaping of something existing, the economy increases, generating profits from investments and lowering unemployment rates. But when this new Innovation is absorbed into society, becoming commonplace, the organization goes into decline, begins to cut back on investments, downsizing jobs and stagnating the economy until further innovations are announced - the economy returns to its peak creating a cycle, designated by Schumpeter (1982) as an "economic cycle", a healthy manifestation for the national economy, because it is innovation that drives this growth.

This is why the economist states that Innovation is like an engine of development, especially when technology is inserted in this context. In other words, Innovation could be understood, from this perspective, as a continuous process of searching for a new opportunity to differentiate, add value, grow economically and have creative thinking in the face of changing cultures and market trends - applying dynamic knowledge. to think about the future, generating new products and differentiated services. However, other perspectives may be taken to delimit the limits and scope of Innovation.

The Oslo Manual aims to guide and standardize the concepts of Innovation, presenting methodologies for technological innovations and research indicators from the areas of Research and Experimental Development (R&D) in industrialized countries. At the core of this

document, the minimum requirement for defining an Innovation is that an organization's products or services must be new or significantly improved so that they can be deployed when placed on the market, that is, when they are effectively used in the operations of companies. as well as new organizational methods in business practices, organization in the business environment and external relations (OECD, 2005).

In this same perspective, the Global Innovation Index (GII) makes use of it, as it annually presents metrics, debates, guidelines and scenarios regarding Innovation in the world and even a decreasing ranking of the countries with the highest Innovation production. It also addresses the phenomenon of innovation as an important element for the development and progress of both economy and competitiveness, pointing out that an innovation agenda has been appearing at the heart of many governments as a growth strategy. In addition, the report presented in the 2018 edition showed the boundaries of what is meant by Innovation, extrapolating the universe of Experimental Research and Development (R&D), revealing a "more general and horizontal nature" including modeling and social innovation techniques. as well as an understanding that innovation in emerging markets has been viewed as critical to inspire the population. Finally, it reveals that it understands that in a broad spectrum of Innovation actors, the largest strongholds are in the service sector and public entities (DUTTA; LANVIN; VINCENT, 2018).

The Frascati Handbook also discusses various aspects, definitions and methodologies on Experimental Research and Development (R&D) that lead to Innovation. According to the Manual, R&D aims to increase the volume of knowledge in order to generate new applications. Thus, it defines that the term unfolds in three activities:

> Basic research consists of experimental or theoretical work developed mainly for the purpose of acquiring new knowledge about the fundamentals of observable phenomena and facts, without considering a particular application or use. Applied research also consists of original work undertaken with the aim of gaining new knowledge. However, it is primarily directed towards a given practical goal. Experimental development consists of systematic work based on existing knowledge gained from research or practical experience, to launch the manufacture of new materials, products or devices, to establish new procedures, systems and services or to improve existing R&D (OECD, 2013, p. 38).

In Brazil, this manual is also used as a basis for the elaboration of Innovation policies, such as the creation of Law 11.196 / 05 known as the "Law of Good", granted by the Federal Government through the Ministry of Science, Technology and Innovations and Communications (MCTIC), which offers tax incentives to private sectors to conduct research and development of technological innovation, seeking to bring companies closer to universities and research centers to enhance R&D results, developing innovation in the country. This Innovation is conceptualized by Article 17, § 1 of the Law, as one that develops, adds or increases improvements in products or processes, obtaining a gain in quality or productivity that results in greater competitiveness in the market (ANPEI, 2017; AQUINO, 2018).

In the Brazilian context, there are public innovation policies that encourage the collaboration of universities, research centers and public research institutions in the Innovation process, constituting an Innovation Law, considered as an instrument that indicates the direction a country intends to follow. This law, previously mentioned, provides for "[...] the introduction of novelty or improvement in the productive or social environment that results in new products, processes or services", stimulating the participation of science and technology institutions in innovation processes, allying with companies (VERZOLA, 2015, p. 190). There would be a global understanding that the smartest and fastest way to produce innovations that boost the economy of the country is through research conducted at universities and research centers, as these are considered sources of knowledge that can be developed to generate products and services. in favor of society, aiming to facilitate the internationalization of scientific and technological institutions, increasing interaction and partnerships between companies and universities, as well as the sharing of resources among them, diversifying financial means to support Innovation (GIRARDI et.al, 2014; SILVA VALENTINE, 2014; AQUINO, 2018).

However, it is here that the Public University has the responsibility and the duty to make a critical analysis of the innovative processes, quantifying and qualifying the social impacts resulting from these processes, in fact, underlining the benefits of Innovation that are being produced and reverted to social and sustainable development, and not just for market interests.

From the previous analysis on the definitions of Innovation, assumed and published mainly in institutional documents, it is possible to identify the predominance of constructing a concept directly linked to the economic, business and competitive context. At the same time, it is already possible to see a broadening of this conceptualization, which is moving towards incorporating the social and cultural implications that result from this process, as constitutive of it.

2.1 Innovation and its adjectives

There are adjectives attributed to Innovation that are promoted in organizations for different purposes. Small businesses, for example, often adopt the **Disruptive Innovation** model. According to Rodrigues, Ciupak and Riscarolli (2017), this type of innovation can happen in such a way as to generate direct implications for the business model. In other words, this innovation occurs in modification, when it makes changes in the shape of technology, not transforming it. or by replacing its essence to generate something new but simplifying it to make it cheaper to deliver to the market. This disruptive innovation would also occur as a direct relationship in existing markets, directly changing technology, perfecting in its essence, not in its use - this innovation is not intended for new markets or unmet customers, but is intended to change the traditional business model by investing and betting on new market values.

According to the authors, the preference of demanding customers is for products developed with higher quality, even if they have to pay more for the merchandise. They seek and consume **Sustainable Innovations,** which are those that focus on business process improvements without changing existing process models or patterns.

Another adjective of Innovation that encompasses environmental perspectives is **Sustainable Innovation**, which contemplates concepts of production of new products or services, focusing on the environmental issue. Therefore, this Innovation prioritizes the use of natural resources, so as to benefit both society and the environment. According to Pinsky et al. (2015), there are two strands to sustainable innovation: **environmental** and **social** - the first concerns environmental issues, and the second concerns the population of the earth, which will generate a severe demographic density for the supply system.

The application of innovation models, whatever it may be, is essentially the combination of information and knowledge, since it is in their interaction and sharing that new knowledge is produced to develop products or services aimed at both the market and the market. the society/environment. Organizations do not improve or innovate on their own, as they depend on the information and knowledge present inside and outside them, so the reference of the **Open Innovation model** - concept designated by the University of California professor Henry Chesbrough in 2003, by publishing the article "The Era of Open Innovation", valuing the collaboration between various social actors in order to channel innovative ideas, identifying and seeking sources of knowledge present outside organizations as part of their internal Innovation process.

The strategy is also used to lower risk levels and resource use, combining internal and external ideas to reach the market. Unlike closed innovation, only the knowledge and intellectual properties accumulated with technologies developed within the organization are used to build new knowledge, neglecting participation and collaboration with other external institutions (CHESBROUGH, 2006; DOS SANTOS; FAZION; MEROE, 2011). ; ZATTAR; ISSBERNER, 2011).

According to Dib e Silva (2011) each social individual is represented as a node that connects to others, forming a network that privileges social interactions and relationships, and the "innovation process is of great importance as, by intensifying the flow of information and interactions promotes learning and knowledge generation" (p. 1808). These "social networks" can be formed by collaboration between the organization and other institutions, such as universities, research centers, suppliers, or even their own users.

When we approach Open Innovation as a strategy for obtaining new external knowledge by organizations to achieve different purposes, we also approach **Social Innovation**, which,

besides being open, carries social aspects in its essence. That is, it refers to the creation of new strategies in order to meet social needs in the most diverse areas, through the cooperation and participation of individuals. According to Juliani (2014, p. 5), this type of Innovation "is a process of collective learning based on the potential of individuals and groups that allows the realization of social transformations, the formation of new social relationships and even new social structures" in order to continually improve the social standard of living while enriching the ability of groups and individuals to act. This Innovation is a phenomenon capable of increasing society's ability to act, seeking new solutions or ideas to eliminate / reduce society's problems.

3 Method: Definition of Innovation in Brazilian Research

The objective of this work was to identify and establish the relationships of the Innovation concepts used in Brazilian research. For this, it was made a cut, as the source of information to be consulted for data collection, using exclusively the database of the Brazilian Digital Library of Theses and Dissertations (BDTD). This Library allows to retrieve, among other data, the summaries of theses and dissertations and also identify the research programs to which they are linked. The cut for theses and dissertations is justified on the premise that published scientific articles are substrates of these projects developed as postgraduate monographs, and thus, substantially, the theses and dissertations translate preliminarily, and often more contemplatively, proposals for academic discussion and the frontiers of knowledge.

Data collection in the BDTD was made in May 2018. As data collection protocol we used exclusively the keyword "Innovation" in all fields available in the database. To retrieve the records in order to construct a variable, we used the Program topic in the search refinement menu, in order to collect the publication records of each program and index to the knowledge area in which it is registered in CAPES. The recovered records were imported into Excel and treated in free software *KhCoder* for textual mining. From this, the process of visualization and analysis of retrieved textual data was started, making it possible to relate the most frequent adjectives (immediately to the right of Innovation) linked to the word Innovation. The calculation of semantic analysis was performed from the following procedures, described in Chart 1.

Chart 1. Textual mining metrics

Cosine trigonometric coefficient	$sim(A,B)=cos(\theta)=(A*B)/\|(\|A\|)\|\|B\|$	It enables an idea of Innovation for each of at least two areas, thus forming a semantic network of groups formed by knowledge areas and their respective discourses, that is, assuming an idea of complex networks that "[…] reveals ordering principles related to their topological structure." (CALDEIRA et al., 2006, p. 1).

Sample equilibrium formula	F/L*1000	F is the number of occurrences of one word per document (in the case of this analysis the summaries), and L being the size of the document multiplied by 1000, so the sampling would be balanced.
differential calculus	(f(x+ Δx)-f(x))/Δx= Δy/Δx	To find the meanings of each Innovation term / idea, the differential coefficient was used, which reveals the semantic function of each Innovation idea.

Source: Authors.

4 Results and Discussions

From the data collection strategy in the BDTD database, it was possible to recover, in May 2018, from the term "Innovation", a total of 11,778. However, by relating them to the variable "research programs", there was a reduction to 3,886 documents that could be connected to their areas of knowledge. With this strategy and the choice of the variable, it was possible to establish a cut for a more punctual analysis in the scope of the IC, in order to complementarily analyze the definition of Innovation in this area.

In textual mining, the free software KhCoder was used for analysis and visualization of textual data, allowing to analyze the occurrences of the most cited innovations in the database, as illustrated in Table 1.

Table 1. Semantic calculation of the term Innovation

Innovation Term / Idea	Occurrences of terms	Innovation term semantics (by differentiation calculation)
Tecnologic innovation	406	"Company", "university", "technology"
Social innovation	138	"Organization", "actor", "context"
Open innovation	88	"Sector", "company", "sharing"
Organizational innovation	50	"Company", "management", "organization"
Sustainable Innovation	46	"sustentabilidade", "desenvolvimento", "impacto"
Pedagogical Innovation	19	"Student teachers", "unidocent", "rupture"
Radical innovation	17	"Company", "product", "model"
Environmental Innovation	13	"Enterprise", "management", "adoption"
Managerial Innovation	11	"empresa", "gestão", "gestor"
Institutional Innovation	10	"Organization", "institute", "role" (in the sense of position or person in charge)

Source: [Authors]

Table 1 shows that it was possible to identify the main semantics that represent each Innovation adjective, the first conception (Technological Innovation) being the most prevalent in Brazilian research and presenting the construction of interdependence between companies and universities.

In a more multidisciplinary perspective, there is a heterogeneous construction in the definition of the concept by describing the semantics that permeate Innovation in the abstracts of theses and dissertations, which can be seen in Table 1, above, on the semantic calculation of the term Innovation. However, even in heterogeneity, what is striking is the absence, at a more prominent level, of the word 'new' or 'different', both seen in Shumpeter (1939,1982) and the exception of Pedagogical Innovation, which embraces in itself the word “rupture”, this being the only concept that would have a path closer to a new concept.

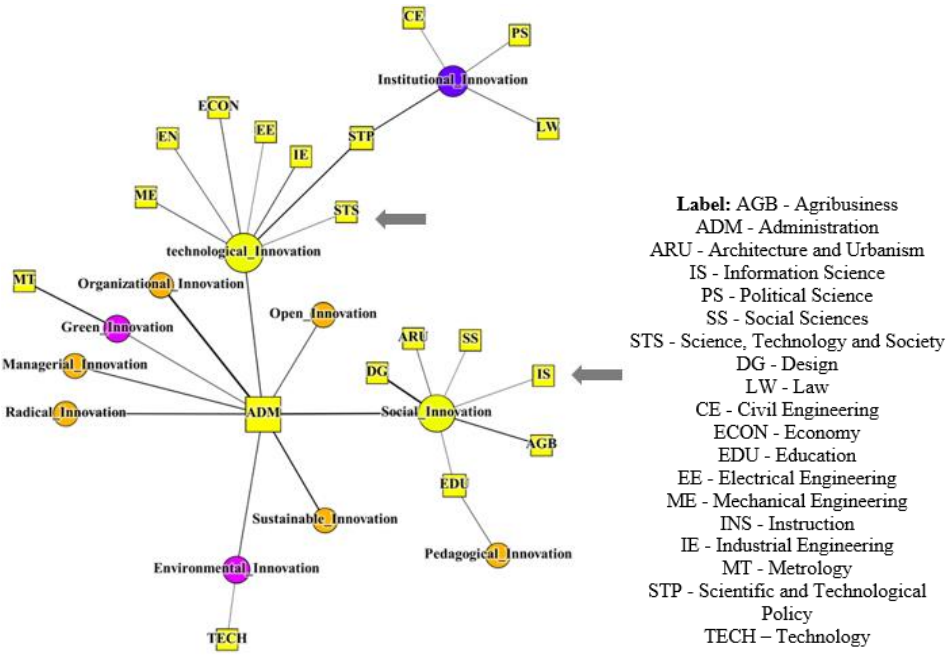
It was also possible to verify in the semantics found in this table, elements that carry in themselves a systemic tone, because when talking about “company”, “sector”, “university”, “actor”, “product”, “institute” and “organization ”, We speak of a systemic space of production, and in this context, is supported by a literature, which is quite circular in Information Science, which are the treatments of Innovation Ecosystem (ADNER, 2006), National System of Innovation , or even local organizational boundaries (LUNDVALL, 1992, 2002; CHOO, 1996; EDQUIST, 1997; ALBAGLI; MACIEL, 2004; PORCARO, 2005; BERTON; MATTOS, 2007; SAROOGHI; LIBAERS; BURKEMPER, 2015); Innovation Awards (BINZ; TRUFFER, 2017).The line of studies in Innovation Systems appears as a scheme in which Innovation emerges from extremely complex processes, precisely because of its relation to the diffusion of knowledge, as well as a translation of this knowledge, a “feed-back mechanisms and interactive relations involving Science”. , technology, learning, production, policy and demand ”(EDQUIST, 1997, p. 3), extrapolating the linear perspective, economic approach born with the proposal of a Linear Model of Innovation by W. Rupert Maclaurin (1907-1959). He worked by investigating the factors that led to technological changes in industry since the nineteenth century and said that the process of technological innovation is composed of several steps in a system of technological innovation (GODIN, 2008).

Interestingly enough, in the 1940s, Maclaurin served as secretary of the Science and Public Welfare committee, one of four committees that assisted Vannevar Bush in the Science: *the Endless Frontier* report, published in 1945, the same year of publication. from the well-known and prestigious Information Science community, Vannevar Bush's, As We May Think report.

Regarding the issue of Innovation processes, much of the literature is based on the interactive learning construct, whose foundation is relational, face-to-face interaction (BINZ; TRUFFER, 2017, p. 3). As can be seen from studies on innovation process that some focus on learning the production systems of organizational units, sectoral or national, such as local production communities (DAVENPORT, 1993; FLEURY, A; FLEURY, M, 1995; KROGH; ICHIJO; NONAKA, 2001).

KhCoder software also provided a semantic network for the terms of Innovation and its interlocutors, as shown in Figure 1 below.

Figure 1. Semantic network of terms of innovation in BDTD.



Source: Authors

Regarding CI, given the justifications already presented in this paper, which consider this area as strategic to optimize the innovative processes, one aspect that stands out concerns an introductory analysis of the occurrence of "Innovation in Information Science", which indicates the social dimension as the driving force of the area. However, it must be clarified that the network shown does not nullify any relationship of CI, or any other areas, with the various terms of Innovation. In practice it is possible to see a relationship of all with all, but the network aims to present the predominant connections.

It is in the social phenomenon, that is, at the level of the social context, organizations and actors that CI infers Innovation and builds domains and relationships. In this sense, by understanding that Information Science is fundamentally connected to the term Social Innovation, we can rescue what Juliane (2014, p. 5) debates in this line, pointing out that Social Innovation "is a process of collective learning based on potential of individuals and groups that enables social transformations, the formation of new social relationships and even new social structures", increasing society's ability to act through new solutions and ideas.

If one takes the conception of Buckland (2018, p. 2), investing in CI is investing in "[...] teaching people how to identify what they know or don't know [...]", and this is a relevant social

concern. The following paraphrase may also be suggested: “identifying what people are accessing or not accessing”, if it is an information-based capacity equalization (PAPAIOANNOU, 2016, p. 310), the importance of CI the evaluation of scientific knowledge, its unique position in acting in “decision-making regarding priorities and investment of research in S&T” and “the elaboration of public policies aimed at the development of society in different sectors” (ALVAREZ; CAREGNATO, 2017, p. 23).

At this point, the concern with the social impact of Information Science is highlighted, but it also indicates the nature and the way in which the area is very closely articulated with the idea of Social Innovation. Finally, the objective is to shed light and bring to the community a debate: the agglutinating symbolisms of motive reason for the upcoming and the next steps, when talking about research and development of knowledge in CI and its relationship. and understanding in innovation.

It is noticed that the meanings and the scope that are conferred to Innovation appear in an elastic way, which is apparently consistent with the main suggestion present in this activity as a space of possibilities. An object that has been built in certain spaces of knowledge, under the foundation of context and area objectives, that is, there is a well understood awareness of what and what is the nature of the elements involved in an Innovation space, but the tone given and the appropriation tend to follow by the individuality of the area.

However, in this scenario of knowledge areas and their domains, there is a fundamental centrality of Administration as a generator and enhancer of Innovation discourses in the production and communication of theses and dissertations, something that is established in line with the spaces and fields that condense in Innovation discourses, which are exactly the actors directed to the management aspect. Realizing this central position of management, considering the global space of innovation in Brazilian research and understanding it in complex network theory as a centrally located node, “consists of the number of actors with whom an actor is directly related” (ALEJANDRO; NORMAN, 2005, p. 16).

Looking at Figure 1, "ADM (Administration)" is not only directly related to "Educational_Innovation" and "Institutional_Innovation", that is, its central position in this framework flows into the idea that this is a case of conceptual migration (DIAS; NASSIF, 2013). That is, it means the use of a certain concept of a science in another science, characterizing conceptual transits that are part of the scientific universe as a "catalyst of the evolution of knowledge". However, looking at the whole of the network, this suffers from strong weaknesses, as one can argue with respect to identity, or the reason for other areas of knowledge. What can be looked at more intimately, and which has already been sought to demonstrate, is by which bias the proximity of CI to management is presented in the space of the concept of innovation.

We highlight here the proposition that Innovation be the object of conceptual migration from Management to CI. “In this context, Information Science, because of its long disciplinary boundary nature, often finds itself dealing with concepts that migrate between its boundary areas, so that there may be some 'distortion' in the central sense of these concepts.” (DIAS; NASSIF, 2013, p. 149). Although the network is not directional, which means that we analyze only the occurrence of terms in documents assigned to certain areas of knowledge, the fact that the centrality in the multiplicity of concepts and connected to the top 3 (Technological, Social and Open Innovation) denotes a knowledge environment with a well-marked presence on the theme, suggesting greater interference from the Administration.

5 Final Considerations

This research aimed to verify, at the heart of Brazilian scientific research, which would be the definitions, adjectives and conceptualizations of innovation developed and applied in different areas of knowledge, emphasizing the IC. This objective was drawn from the general problematization that involves the constant orientation for the Brazilian Public Universities to position themselves and interact in the Innovation processes. Considering the results obtained from the semantic analysis, it was possible to point out that the main semantics involving Innovation in the field of academic research confirm an intense stronghold of thought linking Innovation with the construct “company” and its underlying issues, such as “organization”, “Management” and “product”.

Logic, as well as its definition, constantly used in research, aligns with the sense of entrepreneurship, however, to say about entrepreneurship rests attention in a scenario that compares the Brazilian research, which throws itself to think Innovation or uses the meanings of Innovation, to the documents of analysis and definition of Global Innovation, as is the case of GII 2018. In this context, there is a duality when it comes to Experimental Research and Development (R&D), because, globally, there is an interdependence company / university, as is the case with the Frascati Handbook, which suggests encouraging the absorption of the academic doctoral system in industrial development departments, in this sense, beyond university autonomy. This aspect needs to be analyzed from multiple perspectives and different voices should be heard in this discussion, so that the Brazilian Innovation scenario does not distort the nature of the public University.

The researches now identified and analyzed quantitatively and semantically at this moment, demonstrate the predominance of the qualification of Innovation as “Technological Innovation” (406 researches). However, if we add the occurrences of investigations focused on social, open, sustainable and environmental innovation (which together total 281 researches),

it can be seen that, as far as research is concerned, there has been openness and reflection on other developments of Innovation, the which go beyond market relations.

This result demonstrates, in some perspective, that the Brazilian Public University has, to subsidize the construction of its Innovation policies, heterogeneous conceptual options that are scientifically validated in different areas of knowledge. This variation demonstrates how challenging it is to establish a central Innovation policy to be unilaterally assumed by these institutions. It is possible to say that each institution would then need to critically assess its vocation for innovation and, in view of this, to contemplate the definitions of this process in a way that best suits its nature and mission.

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