# METHODOLOGICAL APPROACHES OF THE RESEARCHES IN KNOWLEDGE ORGANIZATION AND REPRESENTATION IN BRAZILIAN CONTEXT

### ABORDAGENS METODOLÓGICAS DAS PESQUISAS EM ORGANIZAÇÃO E REPRESENTAÇÃO DO CONHECIMENTO NO CONTEXTO BRASILEIRO

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**ABSTRACT**

Scientific knowledge is characterized as rational, systematic and verifiable, its verification is made possible through scientific methodologies. The construction of scientific knowledge requires the adoption of appropriate methods according to the characteristics of the different areas. This study focused its analysis on Knowledge Organization field, which is nuclear in Information Science, as in a simplistic way, it makes possible information organization through concepts explanation and their relations in a contextualized way, improving information retrieval. The main objective was to know the methodological approaches used by the researchers in Knowledge Organization area. The research is characterized as exploratory, with a qualitative-quantitative approach, and uses the bibliographic research as methodological procedure. The corpus was composed of 184 papers presented in Working Group 2 of the *Encontro Nacional de Pesquisa em Ciência da Informação* (ENANCIB), between 2013 and 2017. It was observed a predominance of woks with a qualitative approach (90.2%), which seems to correspond to the nature of the object studied: the concept. It was possible to verify that most researches (76%) are theoretical, that is, they verify, analyze and construct theories. Of the 184 papers analyzed, 82 presented more than one methodological procedure, of which 4 presented more than 2 methodological procedures. It is verified that it is recurrent the lack of clear indication of the adopted methodological procedures, weakening the validation of the researches. It concludes that the researches in Organization of the Knowledge, in the Brazilian context, develop researches with qualitative, theoretical approaches and that are fomented by the own scientific literature.

**KEYWORDS**

Knowledge organization; Information Sciences; Scientific methods.

**RESUMO**

O conhecimento científico é caracterizado como racional, sistemático e verificável, sua verificação é viabilizada por meio de metodologias científicas. A construção do conhecimento científico requer métodos que forneçam um aporte adequado às características das diferentes áreas. Esse estudo direciona sua análise para a Organização do Conhecimento, que evidencia-se como nuclear na Ciência da Informação pois, dito de forma simplista, viabiliza a organização da informação por meio da explicitação de conceitos e suas relações, de forma contextualizada, possibilitando a recuperação. Apresenta como objetivo conhecer os enfoques metodológicos utilizados pelos pesquisadores da área de Organização do Conhecimento no Brasil. A pesquisa é de natureza quali-quantitativa, caracteriza-se como exploratória e utiliza como procedimento metodológico a pesquisa bibliográfica. O corpus é composto por 184 trabalhos apresentados no Grupo de Trabalho 2 do Encontro Nacional de Pesquisa em Ciência da Informação (ENANCIB) entre os anos 2013 e 2017. Observa-se uma predominância de trabalhos com abordagem qualitativa (90,2%), o que condiz com a natureza do objeto estudado: o conceito. É possível verificar que a maior parte das pesquisas (76%) é teórica, ou seja, verificam, analisam e/ou constroem teorias. 82 trabalhos analisados apresentam mais de um procedimento metodológico, e desses, 4 apresentam mais que 2 procedimentos metodológicos. Verifica-se que é recorrente a ausência de indicação clara dos procedimentos metodológicos adotados, fragilizando a validação das pesquisas. Conclui que as pesquisas em Organização do Conhecimento, no contexto brasileiro, desenvolvem pesquisas com abordagens qualitativas, teóricas e que são fomentadas pela própria literatura científica.

**PALAVRAS-CHAVE**

Organização do conhecimento; Ciência da informação; Método de pesquisa.

# 1 Introduction

Scientific knowledge is characterized as rational, systematic and verifiable, its verification is made possible through scientific methodologies. The construction of scientific knowledge requires methods that provide an adequate contribution to the characteristics of the different areas. Information Science (CI) was pointed out by Wersig (1993) as a prototype of a new science, which requires different methods of the so-called 'traditional' science. The definition of a "new science" finds soil fertile for discussions in the area, raising well-known questions such as: Would CI be a new name for old practices? This "new science" presents what characteristics that put it at this level? The answer to these questions is not objective of this research, here we are interested in the characterization of the CI as a science that makes use of different scientific methods to approach its objects and practices. Saldanha (2010, p.303) states that,

> [...] thinking the field (today consecrated with at least two expressions - Information Science and Library and Information Science) is to think not of an object, but of a practice: organize - confer an arrangement to a set of symbolic manifestations or materials aiming at their resistance in time (permanence) and their access in space (freedom).

More specifically, this study directs its analysis to the research methods adopted in the area of Knowledge Organization (OC), which is evidenced as nuclear in IC. Put simply, and complementing the quote from Saldanha (2010), the OC facilitates the organization of information through the explication of concepts and their relationships, in a contextualized way, enabling recovery. According to Sales (2015), there is no consensus regarding the relationship between IQ and OC. The author affirms that in certain traditions these are seen as independent areas, bound only by certain research interests. In other traditions, the author states that the OC is seen as a part of the IC.

The National Association of Research and Post-Graduation in Information Science (ANCIB) promotes the National Meeting of Research in Information Science (ENANCIB), which is organized in 11 Working Groups (WGs). A WG is specific to discuss issues related to the Organization and Representation of Knowledge, GT2, which constitutes an important space for socializing the research developed around this theme in Brazil. Considering that the Knowledge Organization is concerned with the characterization and ordering of knowledge (SMIRAGLIA, 2013), what methodological procedures are being adopted in the research developed in this area in Brazil?

Thus, this research aims to know the methodological approaches used by researchers in the area of Organization and Representation of Knowledge, which they publish in Working Group 2 of ENANCIB (GT 2 ENANCIB). It is justified by the fact that, by highlighting and problematizing the methodological approaches used by the WG, it is possible to mature and advance in the process of consolidation of research in the area and to foment the discussion about the institutionalization of the Knowledge Organization in the country.

## 1.1 Epistemological perspectives in the organization of knowledge

The epistemology of an area of knowledge is delineated by the theories, principles, objects, objectives and hypotheses that constitute its genesis and development (JAPIASSÚ; MARCONDES, 2006). According to Hjorland (1998), the Knowledge Organization (OC) presents four central epistemological perspectives: empiricism, rationalism, historicism and pragmatism. For Smiraglia (2013, page 2, our translation), from the point of view of empiricism, "knowledge encompasses what we can observe". Already from the standpoint of rationalism, "knowledge encompasses what we can logically discern," that is, it involves abstraction that can approximate more or less idealism. Historicism, according to Smiraglia (2013), analyzes knowledge from past experience, through a cultural perspective, and finally, in pragmatism, knowledge is contextual and validated in a given time period. The origin of the empiricist and rationalist conceptions are related, respectively, to the natural sciences and to logic and mathematics (SMIRAGLIA, 2013).

For Saldanha (2010) the approaches that maintain the connection with the natural sciences appear in the OC like searches that look for "the truth", generally resting in a representationist philosophy and searching for a generalizable essential language. The author exemplifies his statement with bibliometric studies, automation of indexing processes, among others. Nevertheless, it is necessary to consider the relevance of these types of research, which respond to certain demands of solutions in treatment and access to information.

Historicist and pragmatic conceptions have increasingly appeared in studies of the organization of knowledge. Weiss and Bräscher (2014) synthesize, based on the literature, the characteristics of the pragmatic approach in the CB: information is constructed, occurs in multiple and heterogeneous contexts and its quality is not constant; practice through interaction is important for the construction and validation of information-related meaning; the bibliography is a source to identify distinct points of view and to construct languages of communication; guide the user in recovering information that goes beyond what is already expected, expanding choices.

On the one hand, the challenges imposed by the idea of heterogeneity and dynamicity of knowledge - object of study of the CB - can cause the discussion of these ideas to move theoretically and take more time to become methodological approaches. On the other hand, historicism and pragmatics have been contributing in the studies of the CB to the reception of the contextual variations of the meanings that compose the knowledge.

Even within a certain epistemological perspective, which is configured as a more macro view of an area of knowledge, it is possible to explore this same area based on a more micro vision that focuses on the individuality of each research carried out. This micro-vision can use the perspective of the methodological procedures listed for conducting the research, that is, the set of logical processes followed when delimiting the approach, gathering, processing, data analysis, etc. (LAKATOS MARCONI, 2010).

In some cases, such logical processes are limited to the exposition of criticisms and reflections without methodological systematization, as is the case in the essay. According to Larrosa (2003), this mode of writing has subjectivity as a determining characteristic and, therefore, departs from the exemption and objectivity generally sought in academic writing. For the author, the production of the essay allows the researcher to also play his role of reader, since he has a certain freedom in the construction of his thought and in the choice of theoretical points to expose.

Valentim (2005, p.19) states that "The different types and approaches of research are related to the way of building a certain area of knowledge, they are also related to the research practice of a given scientific community." research, ie the method of approach and analysis of the object to be studied, impacts on the definition of which dimensions of this object will be reached (hypotheses) and revealed (objectives) and, consequently, also contribute in a relevant way to the epistemological delineation of the area .

However, classifying the research method employed in a particular study is not an easy task. It is known that, despite the rigor of scientific research, certain subjective nuances that may appear at the time of data collection and / or analysis are not always accurately described. In addition, the literature presents different points of view regarding the description and naming of the method, resulting in different types of classification, such as: qualitative, quantitative and mixed (CRESWELL, 2007); methods of qualitative research with focus in the area of Information Science (CI): analysis of social networks, focus groups, content analysis, etc. (VALENTIM, 2005); classification of research according to its purpose (basic, applied), objectives (exploratory, descriptive, ethanalytical) (GIL, 2010); research techniques such as documentary research, bibliography, interview, observation, case study (LAKATOS; MARCONI, 2010); among many others. We must also consider the author's interest in detailing in a more or less precise way certain aspects of the method adopted, according to what seems relevant to his object of study.

Without considering these aspects, the construction of the panorama of the methods adopted in the CB can lead to the misunderstanding of too much generalization, leaving aside the wealth that the variety of methodological approaches may represent. Faced with such a challenge, we adopted inductive bias in the present research, that is, the classification of research methods occurred as the corpus presented itself, revealing a plural approach character, as will be seen in the results.

## 2 Methodological Procedures

The research is qualitative-quantitative in nature, characterized as bibliographical and exploratory, using bibliographic research as a methodological procedure. The GT2 - Organization and Representation of Knowledge - of the ENANCIB was chosen as corpus of the research for being the main forum for debates in Information Science in Brazil, an area in which the OC found a space for discussion, especially in the postgraduate courses. The corpus is composed of 184 papers presented in the working group, between the years 2013 and 2017, available in the Benancib database, contemplating a 5-year survey that represents a representative sample.

The abstracts of the papers were analyzed and classified according to Table 1. In cases where the abstract did not present the characterization of the methodological procedure of the research, the text was analyzed in its entirety.

The categories presented in the first column of Table 1 were defined a priori; the types of research presented in the second column were raised inductively. For counting purposes, methods that presented similarities were grouped under the same term, for example, "bibliographic survey" and "bibliographic search". Some papers did not declare the method used, but, although subjectively, they described certain procedures. In these cases, the methods were arbitrarily named, however, they were labeled as an "undeclared method". The category "Others" was also used to indicate methodological procedures that were not named by the authors.

**Table 1.** Categories of analysis

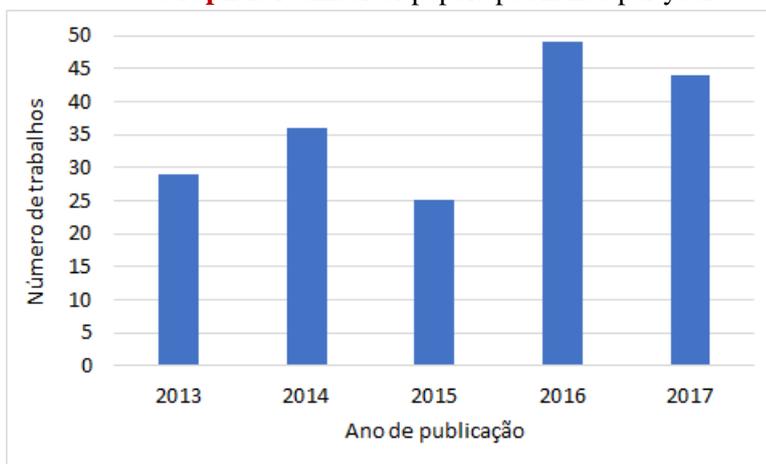| CATEGORIES | TYPES |
|---|---|
| **NATURE** | Theoretical<br>Applied<br>Other |
| **APPROACH** | Quali<br>Quanti<br>Quali-quanti |
| **METHODOLOGICAL PROCEDURES** | Bibliographic survey, Documentary survey, Domain analysis, Content analysis, User study, Terminology study, Metrics, Interview, Case study, Essay / Reflection, Collective Subject Speech, Diplomatic, Verbal Protocol, Focus Group, Subject Analysis, Documentary Analysis, Others. |

Source: Authors (2018)

For each article analyzed extracts were drawn which illustrate the indication of the methodological procedure (s) adopted, and some will be presented in the results.

# 3 Results

The results will be presented according to the categories analyzed. Graph 1 shows the number of works distributed in the analyzed years, being possible to verify an oscillation in this distribution.

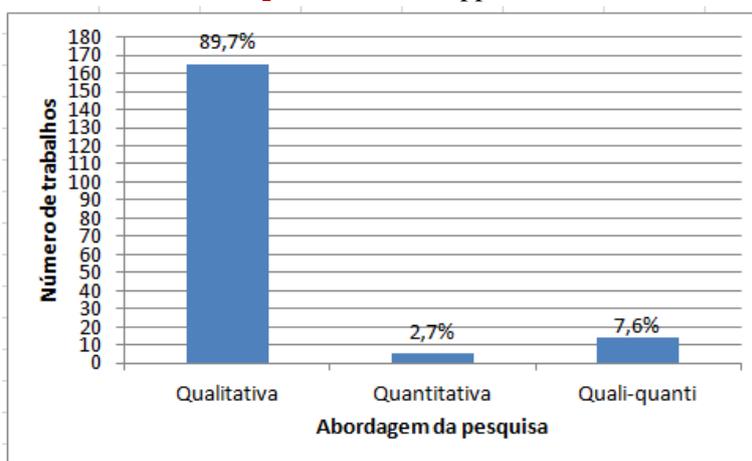**Graph 1.** Number of papers published per year.



Source: Authors (2018).

The year 2015 is the one that has the lowest number of papers presented in the GT 2 of ENANCIB, in the analyzed period. Although it is not the objective of this research, it is possible to raise some hypotheses for inconstancy in the number of works, such as the region in which the event is performed. In the two years with the lowest number of papers, 2013 and 2015, the event occurred in extreme regions of Brazil, Florianópolis / SC and João Pessoa / PB, respectively, making participation more expensive.

Graph 2 shows the research approaches, classified in qualitative, quantitative and qualitative-quantitative. It is observed a predominance of works with a qualitative approach (90.2%), which corresponds to the nature of the objects studied, such as information and knowledge.
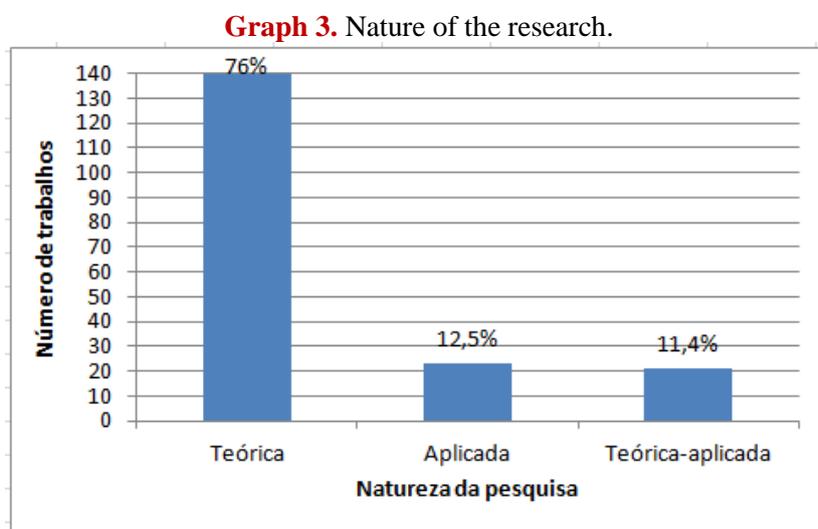
**Graph 2.** Research approach.



Source: Authors (2018).

The qualitative approach is commonly used in the Social Sciences and has as fundamental characteristic the valuation of the subjective and variant (non-absolute) aspects of the problem. For Saldanha (2010), these aspects are united in the idea of pragmatics that precisely predicts the study of the phenomenon or object in the form presented in reality, with its antagonisms and dependence from the point of view (relativism of analysis). In this sense, the pragmatic approach has been increasingly used in the OC studies, Saldanha (2010, p.302-303), says that,

> We call the pragmatic tradition the sum of family similarities of sociological [...] and anthropological approaches ..., which sums up here methodologically in turning to language, approaching an informational pragmatism (in the philosophical concept of pragmatism, aimed at anti-dogmatism, anthropological analysis of language and micro-study of contexts).

Thus, this approximation of the OC with the pragmatics generates researches that can only be developed from a qualitative approach, since they do not have as objective the construction or verification of truths about the area, instead, they seek their understanding through the contextualization.

Graph 3 presents the classification of the research in relation to its nature, applied, theoretical or theoretical-applied.

**Graph 3.** Nature of the research.
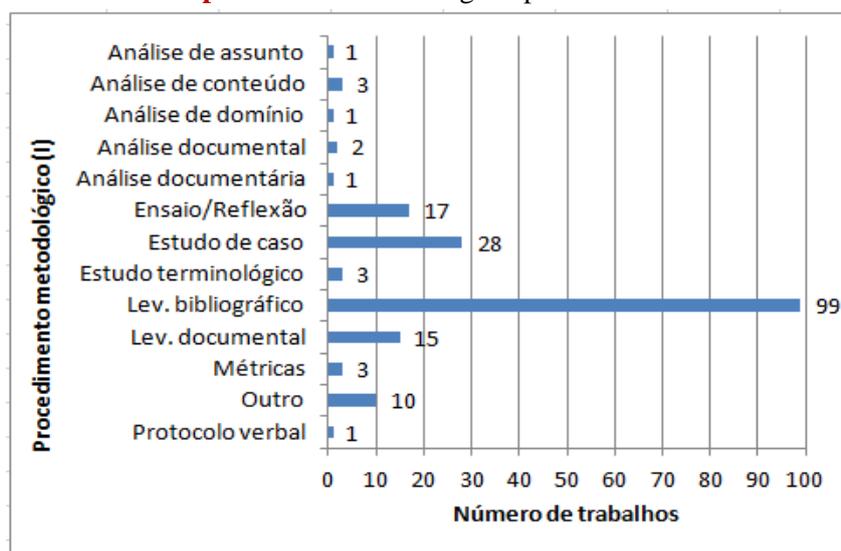


Source: Authors (2018).

It is possible to verify that most of the researches (76%) of GT2 are theoretical, that is, they verify, analyze and / or construct theories. The OC works with concepts and their relationships, from the perspective of organization and representation, which leads to the understanding that a theoretical approach responds better to these characteristics. But it also points to the need for research to be validated in the practical field of experience, as well. It seems to us that it is a process of maturation of the area, which begins with the discussion and theoretical deepening to address the practical findings.

Graphs 4 and 5 present the methodological procedures adopted in the research, the main objective of this study. Of the 184 papers analyzed, 82 showed more than one different methodological procedure, and of these, 4 papers present more than 2 different methodological procedures. In the analysis process, it was verified that in 55 studies (30%), the authors did not present clearly the methodological procedures used, although they were characterized in some cases. Thus, it was necessary, starting from the more detailed analysis of these surveys, to name the method used. In the sense of exemplifying, we cite the excerpt from a research analyzed that says, "The present work approaches some aspects about the reading of collections of ethnographic nature of interest for the organization and representation of the information. Specifically, it deals with the photographs produced in coordinated scientific expeditions [...] ", the authors did not name the methodological procedure used, but, by the characterization, it was classified as documentary analysis, since the information of photographs produced in a specific project. Another research that does not explicitly mention methodological procedures, states that, "We discuss the methodological issues related to the organization and representation of information in Musicology and in the Organization of Knowledge, seeking to show convergent points between the two areas [...]".

The discussion was carried out from other studies on the subject, characterizing itself as a research that presents as a methodological approach the bibliographic survey.

Graph 4 presents the first or only methodological procedure used in the analyzed works.

**Graph 4.** First methodological procedure used.



Source: Authors (2018).

The bibliographic survey was used in 99 works (54%) as the main methodological procedure, being the most pointed method. In general, the research analyzed are qualitative and use the literature as a method, so it can be said that the GT2 develops qualitative and theoretical researches and that are fostered by the scientific literature itself. Is this an inherent feature of research in the field, or has it been little advanced in practical experiments, for the reasons already cited? Also noteworthy is the significant number of essays / reflections, 17 papers, which do not present a clear methodological contribution, following the guidelines

given to authors submitting papers to ENANCIB (2017), which indicate that,

> The section on methodological procedures should present clearly and succinctly the nature of the research [qualitative, quantitative, qualitauantitative], the type of research [descriptive-exploratory; documentary; bibliographic; etc.], the method used, the techniques and procedures adopted for the collection and analysis of data.
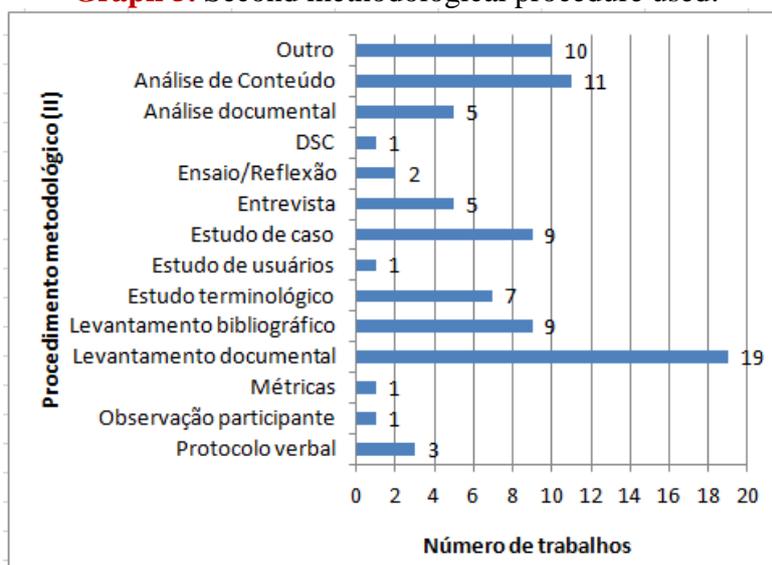
In addition to these studies, another 30% do not follow the guideline, not presenting clearly and explicitly the procedures adopted, in the case of scientific research, this fact weakens the studies and may generate questions. We should also consider, as mentioned earlier, that some researches have characteristics that make them difficult methodological framework.

Another result that draws attention is that only one study uses domain analysis as a methodological approach, which leads us to question the fact that the pragmatic approach is more evidenced in the theoretical basis of the research in OC in Brazil than as an approach methodological approach. Guimarães (2014, p.19) points out that the use of domain analysis as a methodological approach in OC research allows a more contextual approach, stating that,

> The domain analysis approach has been especially important for the organization of knowledge as the treatment processes start to be approached from the context of production - and use - of that knowledge, which is in line with the current cultural approaches of an area that has been the subject of concern for researchers such as Antônio Garcia Gutierrez, Hope Olson, Caire Beghtol, Grant Campbell, Maria José Lopez Huertas and others.

However, it appears that this approach has not been used by the OC researchers in the research published in the ENANCIB WG2. This fact may also reveal a lack of research on cultural approaches in OC, leaving shortcomings in the processes of representation and organization of the knowledge of minority groups, such as blacks, Indians and homosexuals, for example.

**Graph 5.** Second methodological procedure used.



Source: Authors (2018).

In the papers that used more than one procedure, the documentary survey appears as the second most cited method, in 19 papers. That is, the bibliographic survey, method that is based on other studies is the most cited as the main method and is complemented by the survey of primary sources. As Weiss and Bräscher (2014, p.696) put it, "The bibliography is a source for identifying distinct points of view and constructing communication languages." Thus, a survey using bibliographical and / or documentary research may have a pragmatic bias.

However, we can verify that the second methods cited are quite pulverized, besides the documentary survey, the content analysis, bibliographic survey, terminological study, are used in 11, 9 and 7 papers, respectively. It is evident that the predominant methodological approaches are those that have as corpus of analysis the literature, being the methods with pragmatic bias, as the verbal protocol, Discourse of the Collective Subject (DSC) and the study of users, in smaller number.

Methods grouped under the 'Other' category could not be defined and named accurately. To exemplify, a paper that had as objective to propose an operative procedure for the construction of corporate taxonomies, affirmed that the presented procedure had been "elaborated through theoretical and practical observations experienced by the authors, through consultative activities", hindering the methodological framework. Still, another paper stated that it used "the methodological approach of multimodality", and it is not clear what this approach consists of.

## 4 Final Considerations

The question that guided this study, which methodological procedures are being used by the research in Organization and Representation of Knowledge in Brazil, was a little clearer from the results obtained. However, as already mentioned, classifying the research method employed in a given study is not an easy task. The characteristics of research in a diverse area such as that which investigates knowledge impose challenges that make it difficult to accurately name the methods adopted.

From the obtained results, the fact that the majority of the studies uses the bibliographic survey to make its researches viable is highlighted. In addition to having an inexpressive number of researches that are at risk in non-conventional methodological approaches that approach pragmatics, such as domain analysis, collective subject discourse or participant observation, for example. Also approaches with a more quantitative bias, such as metrics, have not found space in GT2 surveys.

Another relevant fact is the fact that 30% of the papers do not state the methodological procedures adopted, which is due to the difficulty of framing the

characteristics and / or complexity of the research in pre-defined classifications. On the other hand, this omission weakens the research, leaving doubts as to how the study was conducted. It is possible that the objective statement of the research method is not of interest or is not a central requirement for the WG2 researchers, after all, the methodological approach must be consistent with the context in which the area is inserted and, in this sense, classifications or even limiting methods do not correspond to the intense sociological and pragmatic trait of OC. However, a more detailed statement of the procedures performed (regardless of a predefined classification) may make it clear to the reader how the research was conducted. This possibility can overcome the possible weakening of the research, as we have previously commented, as well as contribute to improve the quality of scientific communication, facilitate the consolidation of results among researchers and, consequently, help in the design of the CB area itself. In this last aspect it is worth mentioning that methodological approaches are influenced and influence the development of the area. It is believed that these results provide clues and hypotheses that can foment new questions and allow a deepening of the thematic and a more accurate look of the researchers of the area on the approaches.

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