

Brazilian Design Management research groups: themes and tendencies

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ABSTRACT

This work presents a systematic review of the Design Management research in the whole country of Brazil. Focusing on existent research groups, it sought to characterize a current design management research scenario. To do so, a systematic review was done considering the design management groups registered at National Council of Scientific Development – CNPq. As result, it was found 53 research groups located in thirteen Brazilian Federal States working with nine different research themes. The results made possible to discuss the group's geographical distribution, the progress of the studies, the growth of the groups over time. It also suggests, towards the advancement in the area, the creation of a research network.

Keywords: design management, research groups, design management research.

INTRODUCTION

This work presents the result of an investigation related to Design Management in Brazil, according to the development of design postgraduate courses. In 1963, design undergraduate programs emerged in Brazil, at ESDI – *Escola Superior de Desenho Industrial*. Nevertheless, many years later, in 1994, the first postgraduate program was launched at PUC-Rio – *Pontifícia Universidade Católica do Rio de Janeiro* (Triska *et al.*, 2014). Since then, other undergraduate and postgraduate programs as well as research groups have been created all over the country.

Design Management is one of the topics covered by different researchers and postgraduate programs in the last years (Santos *et al.* 2016; Triska, 2014). Design Management is characterized by the resources management of an organization in order to identify needs, devise strategies and put them into operation, and thus achieve their objectives with competitive advantage (Martins, 2004; Sousa, 2014). Its emergence was based on the industries, where the organizational structure displayed lack of integration of the activities involved in the productive process (Martins, 2004) and, according to this, the first attempt to

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include design management studies in a postgraduate program was conducted by Magalhães (1997).

One of the sources to follow the Brazilian design academic development is the DGP¹ (Research Groups Directory). This directory was created and is maintained by the National Council for Scientific and Technological Development (CNPq) to offer, integrate and organize related information about research groups (CNPq, 2018). This directory offers free access and comprises the largest collection of research groups in higher education courses. Although this directory is responsible for regulating groups, the responsibility for registering and maintaining the information therein lies with the researchers themselves and their institutions (DGP, 2018).

Even with the facilities offered by the DGP, it is not evident which are the themes and tendencies studied by the groups, mainly for the difficulty of accessing some information related to these research groups. In some cases, it is necessary to look for them one by one and, then, to analyze them individually.

This is a key factor to the knowledge of the current design management research situation in Brazil. It is also an important factor to establish the future of research strategies by researchers and their groups, as knowing its tendencies as well as issues already strongly developed can help with the advancement of research.

Thus, this work presents a study in the form of a systematic review, considering the research groups listed in the CNPq system to answer the question: "How is the current Design Management research scenario?". The aim was to identify themes and trends focused by the current Brazilian groups. To achieve this, the work took a theoretical framework to define terms and concepts developed upon a systematic review.

1. THEORETICAL BACKGROUND

This research took as a first step the definition of some terms related to Design Management, in order to align the understanding of the subject. Problems were perceived, especially, in relation to the terms used for the significance of the studied subject, what could cause theoretical conflicts and affect the research. This is highlighted by Silva e Merino (2017), when they say that the integrations of the design with the strategic and management side of the companies involves the absorption of a designer's traditional different tasks and responsibilities. Following this, it is expected that this differentiation also runs in the way of defining and explaining the new positions and as such new and different terms are proposed.

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Design Management is the discipline that seeks strategies to maintain, develop and innovate products and services in order to achieve organizational success (Padilha *et al.*, 2010).

Tanurea and Kistmann (2010) point out that in this case, design is used as a "fundamental part for making strategic decisions", acting on different organizational levels: strategic, functional and operational.

But, Strategic Design, which is the design area used for strategic decision-making and is at the highest level of management among others, is often confused as the only level used by design management and thus mistakenly ends up being treated as synonymous with Design Management (Emídio, 2006).

Through Design Management one makes decisions about several areas of research, such as production, marketing, human resources, administration, etc. Because of these performances, other terms tend to emerge and end up being worked as synonyms of Design Management. Among these terms, the most common is "branding", which works with brand management, and another quite frequent is design thinking, which acts as a problem-solving process. Both terms are part of Design Management but are not synonyms, which often cause confusion (Wolff, 2010).

Along with this, in the attempt to express the holistic work carried out by the synergy between several companies that can or cannot make use of the Design Management in their organizations, one can perceive the emergence of the term "systemic design". This term is used by some authors as another synonym for "design management" because it uses similar concepts and systematizations (Pêgo and Oliveira, 2015).

In Brazil, adding to this profusion of concepts, "design management" can be found in portuguese as "*gestão de design*" and "*gestão do design*", where the former can be related to the theory of the formal program of activities within a corporation, including products and services, in a strategic and integrated manner, while the latter is restricted to the design of the project itself (Wolff, 2010). Despite the existing differentiation, these terms end up being treated interchangeably by some researchers. It is considered that "*gestão de design*" is more similar to concept of "design management" (Tanurea and Kistmann, 2010).

Making clear the differences between the terms, some other points referring to studies about Design Management need to be considered. Design Management is based on the need of industries to position themselves competitively in the market (Tanurea and Kistmann, 2010; Libanio and Amaral, 2011). However, its study is generally done academically and

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theoretically with the analysis of case studies (Silva and Merino, 2017). Another approach is the strategy planning and market testing such as AB testing, where a system is tested with different modifications for different groups and the results are compared (Wolff, 2010). These studies support the evolution of the area and the efficient application of Design Management.

Regarding themes researched within design management, Santos *et al.* (2016) mention studies on the development of methods and methodologies, the role of directors in Design Management decisions, quality management issues, producer chain management, research and development within organizations, and the use of technologies and innovation as a strategy for internal and external improvement.

Other contributions can be seen in Tanurea and Kistmann (2010), showing that the correct and efficient management of a company depends on its maturity, and that smaller and younger companies find it more difficult to use and proliferate the concepts and actions necessary to the implementation of Design Management. Or in Baars (2002), who comments on the importance of the subject to improve the competitiveness of companies, and that it is necessary to move closer between Production Engineering and Design Management, by encouraging this type of study in research and academic projects.

As well, in the context of the whole country of Brazil, geographic issues are also important, given the fact that it is a continent-sized country and thus the locations of the study groups are important for possible contributions and groups partnerships. As Lorenzini *et al.* (2014) show, many States of the country are locations where themes related to Design Management can be found. In these places the main universities mentioned are: PUCRJ, UNESP, UNISINOS, UFMG, UFPR, UFRJ, UFSC and USP within the postgraduate courses in Production Engineering, Design and Management.

2. RESEARCH METHOD

To state the current situation of design management research in Brazil, this work used a systematic review performed in the Research Groups Directory - DGP of CNPq Lattes platform. This systematic review differs from traditional review techniques, which use periodic databases to find results. In this case it was necessary to adapt the traditional model of systematic search to fit the system used, the DGP.

Initially, it was necessary to become familiar with the system. It was verified that the use of strings (formulations of structured sentences with boolean operators) was not possible in

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the search because the system only works with search terms. We also saw that in addition to the terms, the system allows you to choose the search fields. We chose to search the group name, research fields and research fields keywords. The DGP searching system can be viewed in Figure 1.

Figure 1. DGP Platform. Source: DGP, 2019

The terms researched (Table 1) were selected with the aim of covering the maximum of possibilities, since "design management" is not the only term adopted in the scientific community. Thus, in an attempt to get closer to the reality of active research groups in the area, it was necessary to search based on the variety of existent terms as presented in the theoretical background.

Table 1

Researched expressions

Expressions	Translation
Branding	-
<i>Gestão de design</i>	Design management
<i>Gestão do design</i>	Design management
<i>Gestão design</i>	Management Design
Design management	-
<i>Design estratégico</i>	Strategic design
<i>Design sistêmico</i>	Systemic design
Strategic design	-

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The tabulated data (Table 2) sought to map all the registered information of the available groups at DGP, in order to do comparisons.

Table 2

Data tabulation

Data Tabulation
Code
Identification
Year
Updates
Theme (Predominant area)
Leader (s) of the group
Number of researchers
University
Research lines
Partner institutions
Participation in research networks

In addition to the data collected from the search system, the main publications associated with the theme of the research group leaders were also compiled, accessing their personal curricula (Lattes) available on the same CNPq platform.

With the explorations completed, groups were aligned from their affinity with the theme of Design Management. Some were eliminated when they appeared repeatedly in the searches with the various expressions used. The results of the systematic review are shown below.

3. RESULTS

This section contains four sub-topics: research groups in numbers, groups along time, research themes and research group locations.

3.1. Research Groups in numbers

According to the method used, Table 3 shows the total number of research groups found related to terms used as well as the final number selected for the following analysis.

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Table 3

Selection of CNPq Research Groups from Search Expressions

Search expressions	Number of groups found	Number of groups selected for the search
Branding	21	6 ^A
Gestão de design	58	22 ^B
Gestão do design	50	6 ^C
Gestão design	74	2 ^D
Design management	1	1
Design estratégico	16	11
Design sistêmico	2	0 ^E
Strategic design	10	5 ^F
TOTAL	232	53

^A 2 more groups found by more than one search expression;

^B 7 more groups found by more than one search expression;

^C 18 more groups found by more than one search expression;

^D 32 more groups found by more than one search expression;

^E 1 more groups found by more than one search expression;

^F 5 more groups found by more than one search expression.

By the end of this, we selected 53 research groups, considering that their works could be related to the Design Management field. It is noteworthy that this survey was done in March 2018, so the number of results may be different today, as the leaders can change their groups any time.

To understand the emphasis of the studies of these groups, Table 4 was then elaborated. It presents the relationship of the research groups with the CAPES² knowledge areas.

Table 4

Incidence of research groups in relation to areas of knowledge by CAPES

Large area of knowledge	Number of Research Groups
Applied Social Sciences; Administration	4
Applied Social Sciences; Architecture and Urbanism	3
Applied Social Sciences; Communication	6
Applied Social Sciences; Industrial Design	33
Engineering; Production Engineering	6
Linguistics, Literature and Arts; Arts	1

Note. Adapted from CAPES (2018b) and the authors (2019).

This table demonstrates that the distribution of the research groups by area has a greater connection with the link "Applied Social Sciences; Industrial Design", with 33 research groups.

3.2. Historical perspective of groups

Among the tabulated data of the research groups, the year of creation and the status of the registration within the DGP are organized in Figure 2. With this, it is possible to observe the relation between the creation dates of the groups (columns) with the total number of groups

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registered in that period (lines). The dots represent the creation years of the groups, colored according to their condition on the platform: running (green), outdated (yellow), deleted (red) and in the process of being filled (blue).

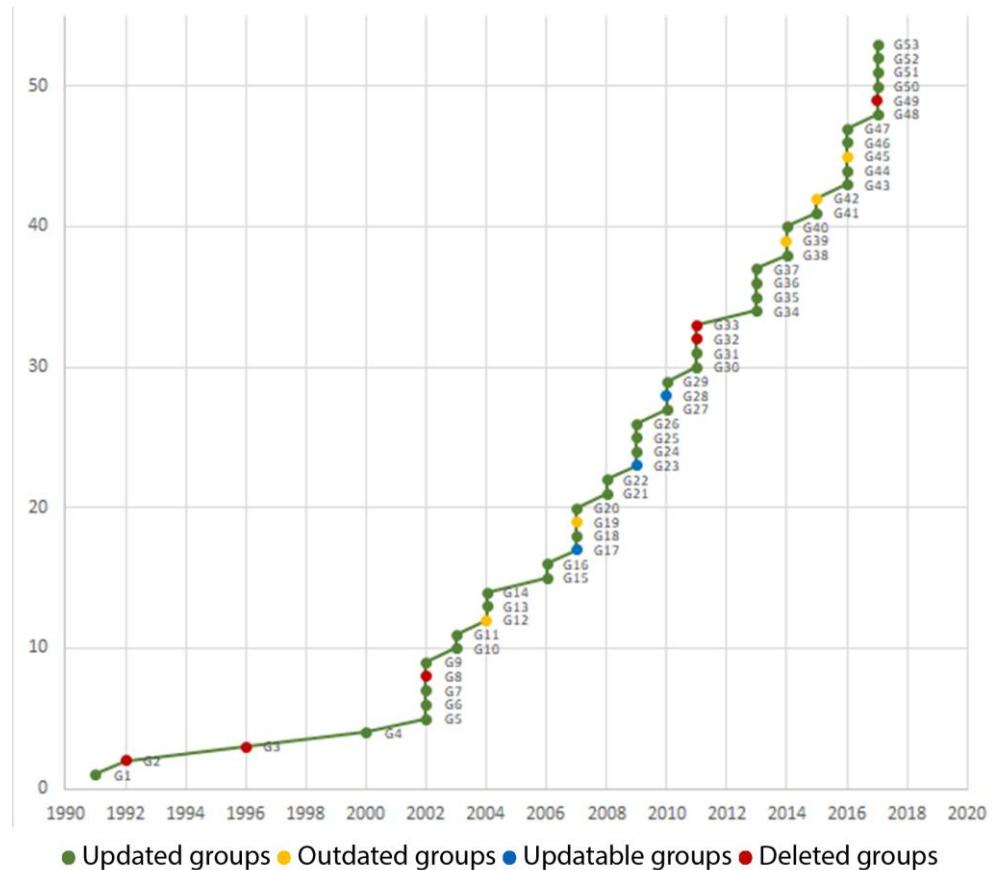


Figure 2. Number of groups open per year, depending on the situation.

As can be seen, over the years it has been a steady growth of research groups in the area while exclusions are occasional. Only 6 of the 53 groups (11.32%) are not functioning, indicating that there is still interest in this research theme. It is important to note that the approval of the research group depends on the interest of the researcher, the creation of the group within the DGP and the consent of the institution where the group belongs.

3.3. Research themes

According to the Research Groups Directory, the line of research "represents themes agglutinating scientific studies that are based on a research tradition from which originate projects whose results have similar affinities" (DGP, 2018). Therefore, when the researchers create a new group, they must choose one or more research themes of interest. The groups

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found chose a total of nine research themes, distributed in a non-uniform way, as shown in Figure 3.

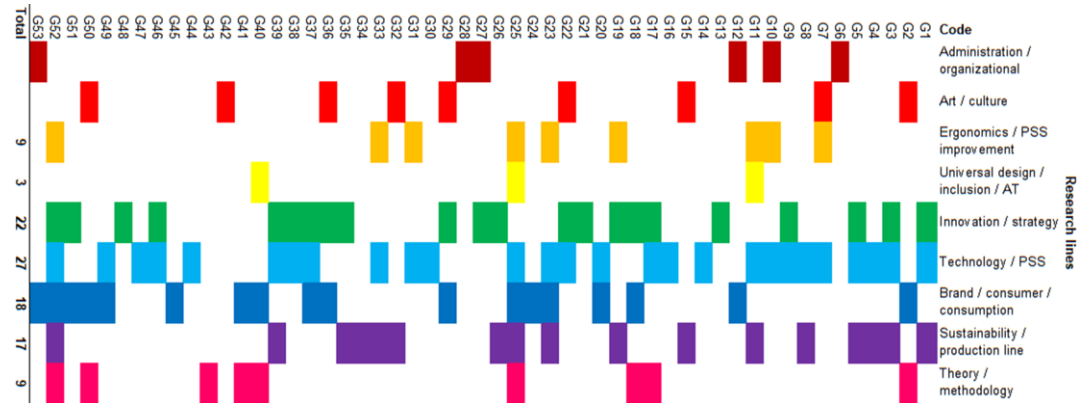


Figure 3. Research themes by research group.

The 53 research groups summarized their work interest in 120 indications of research themes obtaining an average of 2.26 themes indications per group, ranging from 1 to 6 indications among the 9 possibilities.

The research theme "Technology and PSS - Product, System and Service " obtained a higher occurrence over the others (27). In addition to it, the area of "Innovation and Strategy" is also well considered, as it is frequently sought by industries, as well as the "Brand/consumer and consumer brands" that are also treated by more groups. The themes found, for the most part, corroborate with what was found by Santos *et al.* (2016).

On the other hand, there are other subjects such as "Administration", "Culture", "Ergonomics", and "Theory" that are still understudied. The less-quoted area is "Inclusion and Universal Design" that is treated by only three groups.

Another trend observed is the attempt to cover more diverse topics together with Design Management: 39 of the 52 groups seek to work with more than one line of enquiry.

3.4. Research group locations

When it comes to discussion the characterization of research groups in Brazil, it is important to recognize that their location is a key factor, as it can influence the research and results found. Thus, this work sought to map where, geographically, these research groups are located, with which universities they are linked to and what kind of partnerships they establish.

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Regarding universities, Table 5, shows the ones that host more than one research group.

Table 5

Host Universities of more than one selected research group

University	Number of research groups
Universidade Estadual de Londrina - UEL	5
Universidade Federal de Pernambuco - UFPE	5
Universidade Federal do Rio Grande do Sul - UFRGS	5
Universidade Federal de Santa Catarina - UFSC	4
Pontifícia Universidade Católica do Rio de Janeiro - PUC-Rio	3
Universidade da Região de Joinville - UNIVILLE	2
Universidade do Vale do Rio dos Sinos - UNISINOS	2
Universidade Federal de Campina Grande - UFCG	2
Universidade Federal de Santa Maria - UFSM	2
Universidade Federal do Paraná - UFPR	2
Universidade Federal do Rio Grande do Norte - UFRN	2

The universities that have the largest number of research groups were: Paraná State University of Londrina, Federal University of Pernambuco and Federal University of Rio Grande do Sul. Next to them are the Federal University of Santa Catarina and the Pontifical Catholic University-Rio, in Rio de Janeiro. Regarding the geographic location, Figure 4 shows a view of the selected research groups in Brazil distribution.

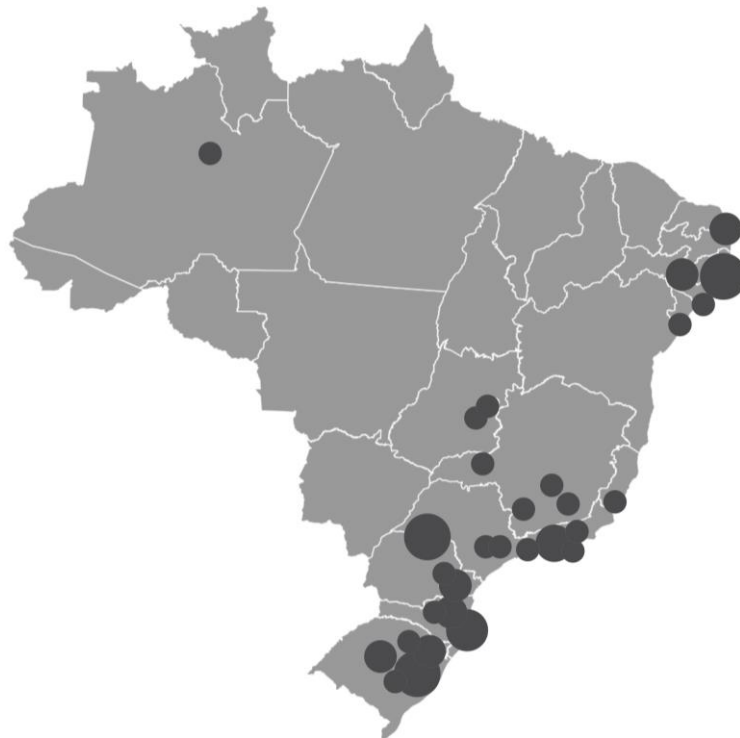


Figure 4. Location of Research Groups.

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The larger points on the map (Figure 4) represent universities with a great number of registered groups. It is also possible to verify the agglomeration of the groups in the South, Southeast and Northeast, with emphasis on the South, which covers 64.7% of the total of the surveyed groups.

Based on Figures 3 and 4, it was also possible to map the research groups with the aforementioned research themes. Figure 5 shows the geographical location in which the works are performed.

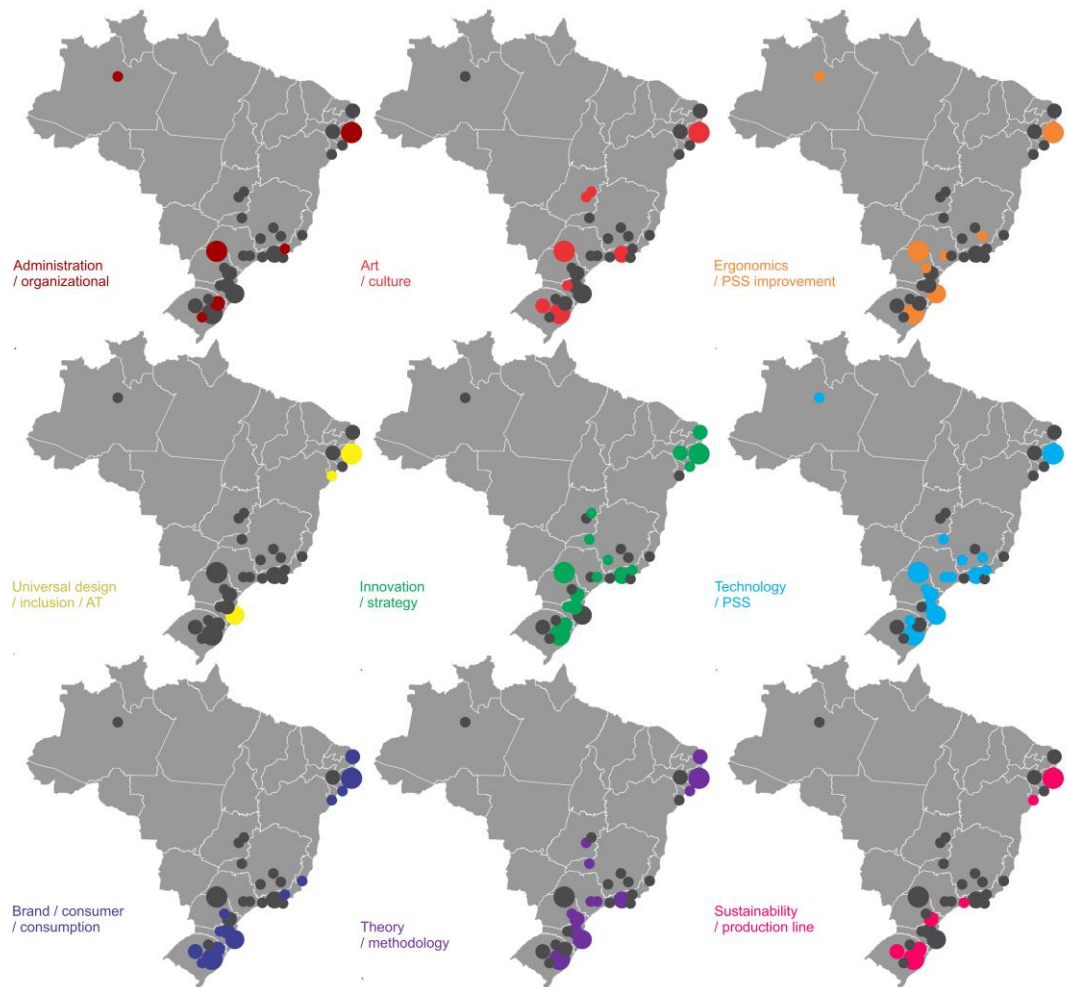


Figure 5. Location of the Research Themes and their respective Research Groups.

As for the mapping of research themes, it is noteworthy that all regions where there is greater concentration of research groups, there is some representation for each theme, except "Inclusion Universal Design and TA", highlighted in yellow, which had no occurrence in the Southeast region.

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We also noticed that there is a spreading of the themes that can mean common interests, regardless of the location of the groups.

Another important factor to consider is the institutions that present themselves as research group partners. In many cases, they are the providers of resources for conducting research. Thus, Figure 6 shows the mapping of institutions registered as partners, together with their general percentage of occurrence between groups.

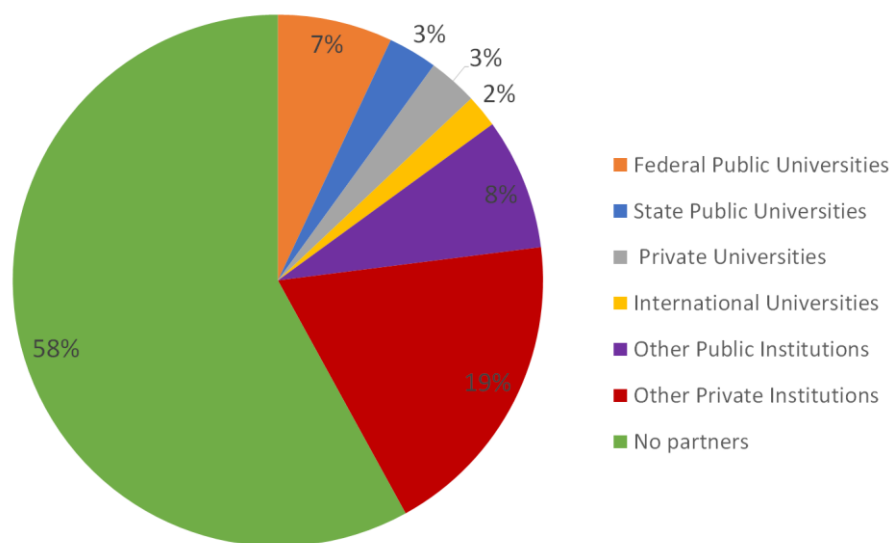


Figure 6. Partner Institutions registered by Research Groups.

Finally, the research themes that were compiled from the Research Groups Directory were related to the themes reported by the group leaders and the themes found in the publications made on behalf of the group were compared. With this, and based on the data in Figure 3, the following information was added to Figure 7, as it follows: a) the research themes that were reported and that existed in the articles were highlighted in green; b) the research themes reported but not found in the articles were colored in gray c) and those that were present but not reported were added with the color blue.

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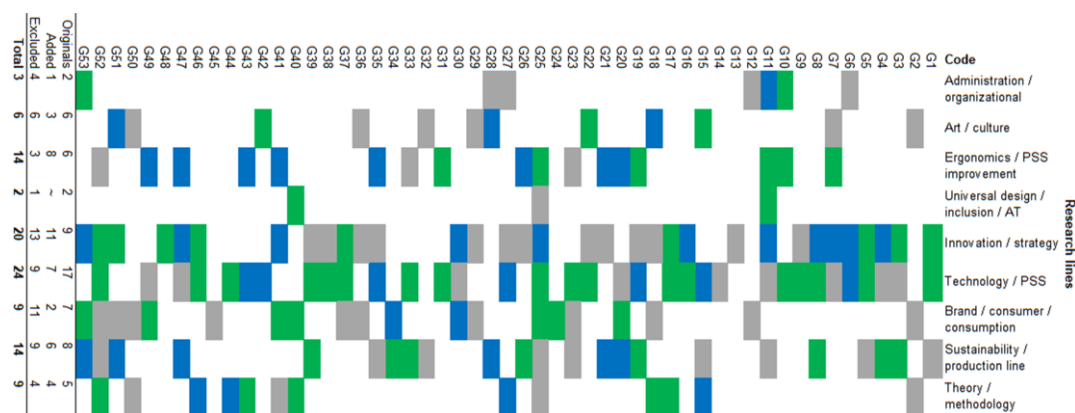


Figure 7. Comparison of Reported Research Lines and Publications Found.

As a result of this analysis, it is imperative to highlight that only 8 of the 52 groups (15.38%) currently publish works within all the lines of research that they have reported.

4. DISCUSSION

From the data collected, it is possible to see that the number of research groups registered on the Research Groups Directory in Design Management is higher than the number of postgraduate courses in Design, since there are currently 25 postgraduate programs in Design registered at CAPES (2018b) and 53 research groups. It can be hypothesized that such a number is possible due to courses such as Production Engineering and Management also being able to study Design Management, especially when linked to postgraduate programs, as identified by Lorenzini, Libanio and Amaral (2014).

Nonetheless, the area of knowledge of “Applied Social Sciences; Industrial Design” was chosen by 33 research groups. Which may be due to the fact that the Design courses and Design Management in Brazil are linked to the large area of Industrial Design, as presented on the CAPES website (CAPES, 2018a).

We corroborated to Lorenzini *et al.* (2014) that some of the universities mentioned still concentrate the most research groups, such as PUC-RJ, UNISINOS, UFPR, and UFSC. In addition to that, we also detected another great number of research groups in UEL, UFPE, UFRGS, UNIVILLE, UFCG, UFSM and UFRN.

For the location of the research groups within the DGP, the term “systematic design” was found being applied by two groups validating the terminology used by Pêgo and Oliveira (2015). And the use of *gestão de design* and *gestão do design* appeared in 58 and 50 groups respectively (Tanurea and Kistmann, 2010; Wolff, 2010) demonstrating that the terms are

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being used interchangeably and that these are the more appropriate terms to be used when referring to Design Management in Brazil.

The data also indicate that there is already robustness in the work of the groups, since the oldest group has been producing for more than twenty years. Works such as Tanurea and Kistmann (2010), Wolff (2010), Libanio and Amaral (2011) and Silva and Merino (2017) support the evolution of the field and the efficient application of Design Management. Cases of disconnection of the researcher's link with the institution may result in the exclusion of the group from the platform, which does not characterize lack of interest in the research area.

One can also see that the percentage of groups that do not have a declared partnership (58.06%) is notorious, accounting for more than half of the total number of selected groups. The partnership with private institutions other than universities is also highlighted. These are usually regionally close to the research group, possibly because of ease of contact, familiarity with the production system and/or product or even the mutual interest of economically promoting the region. The works developed by the researchers shows a higher number of themes related to small companies, as seen in Tanurea and Kistmann (2010). Some are related to Production Engineering as supported by Baars (2002).

As pointed out by Silva e Merino (2017), a wide range of subjects could be found among the groups. Innovation, strategy, branding and design thinking aspects are well considered, corroborating to Emídio (2006), Tanurea and Kistmann (2010), and Wolff (2010). Regarding themes researched within design management, Santos *et al.* (2016) also mention studies on the development of methods and methodologies, the role of directors in design management decisions, quality management issues, producer chain management, research and development within organizations, and the use of technologies and innovation as a strategy for internal and external improvement.

Regarding to the research line PSS - Product, System and Service a new subject was found and it can be considered a new trend, perhaps not only because of the scope of the research, but also because of the constant economic interest in new technologies and specialized services. Also, the ever-growing trend for sustainable actions is also the focus of this line, and the results emerge through publications and partnerships signed with the private sector. On the other hand, the least researched lines such as universal design, inclusion and AT (Assistive Technologies) indicate that there is still a lack of incentive of the society in research projects in these areas of Design Management.

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Finally, the low number of publications within the reported lines of research needs to be put in perspective. The cause of this inconsistency may vary, but it stands out that:

- The search was limited to only those papers bearing the name of the group leader;
- The possible outdatedness and lack of knowledge in filling out the DGP;
- The group may, and generally does, currently works on other lines of research (as shown in figure 7).

The latter may also be a consequence of the great turnover of researchers within the groups. Because most of the groups are in postgraduate programs, the researcher at the end of its program often leaves the group and their study is finished.

5. FINAL CONSIDERATIONS

With this work it was possible to present the research scenario of Design Management accordingly to the CNPQ's DGP in Brazil. Among the information collected it was possible to see that currently there are 53 groups, working with nine different themes, located mainly in the South, Southeast and Northeast areas of the country and that the evolution of the subject is in Technology, PSS - Product, System and Service and Sustainability fields.

Nevertheless, considering the information collected, we established nine groups of research themes: administration and organizational, arts and culture, ergonomics and PSS improvement, universal design, inclusion and at, innovation and strategy, technology and PSS, brand, consumer and consumption, sustainability and production line and finally theory and methodology.

In relation to the results and discussion, the importance of the region of the research and its influence on the themes and work carried out is noticeable. In addition, the positive distribution of research groups that cover a large part of the national territory was distinguished. Another issue to be highlighted is the importance of the continuity and maturation of research, regardless of institutional and/or personal links.

The research was conducted using two database systems managed by CNPq, the DGP and the Lattes Curriculum. Both systems benefit the access to research in Brazil because they standardize and agglutinate information in an organized way. However, as the filling of the documents is done by researchers with little orientation and without control of institutions, information management and update may hinder the veracity of data. This applied

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systematic revision method can be used for similar works, including in other areas of research in order to know the current panorama of other topics of interest.

These factors lead one to believe that it would be beneficial to create a research network that would act as a linking mechanism for groups working on the same subject, in order to allow better integration, exchange of information, collaboration, and thus contribute significantly to advances of research in the area.

ACKNOWLEDGMENTS

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ENDNOTES

¹ DGP - Diretório de Grupos de Pesquisa do CNPQ.

² Coordination for the Improvement of Higher Education Personnel (CAPES) is a Brazilian foundation responsible for the organization and classification of national postgraduate programs.

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