Mapping of research groups with interface in social technology of the Federal Institutes of Education in Brazil

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Abstract: the aim of this study was to map the research groups that study the field of social technology in federal institutes (FI).The FI were created through law 11982/2008 these make up the federal network and present differentials such as inclusive potential, networking, offer at different levels and modalities, from technical education from medium to graduate level, focusing on the training of teachers offering different degrees (CONIF, 2022).**Background**: Social technology means a set of techniques, transformative methodologies, developed and/or applied in the interaction with the population and appropriated by it, which represent solutions for social inclusion and improvement of living conditions. **Materials and Methods**: This study was characterized as documentary research, (1) with a quantitative and qualitative approach and delineated as exploratory. The CNPQ Platform was the place to search for the data. The data were categorized as IF; region; line; predominant area of study. **Results**: Fifty-two lines belonging to thirty-four research groups belonging to fifteen different institutes of four Brazilian regions were mapped. **Conclusion: The** choice of data search by the CNPQ Platform made it possible to know that there are fifty-two lines belonging to thirty-four research groups distributed in fifteen different institutes of four Brazilian regions.
Keyword: research group; federal institute; CNPQ; social technology.

I. Introduction

The Federal Network of Professional, Scientific and Technological Education (RFEPCT) is represented through the National Council of Institutions of the Federal Network of Professional, Scientific and Technological Education (CONIF) which is an instance of discussion, proposition and promotion of policies for the development of professional and technological training, research and innovation and aims at valuing, strengthening and consolidating the forty-one (41) IF gathered (CONIF, 2022).

The FI were created through law 11982/2008 these make up the federal network and present differentials such as inclusive potential, networking, offer at different levels and modalities, from technical education from medium to graduate level, focusing on the training of teachers offering different degrees (CONIF, 2022).

The CONIF creation rules dated March 24, 2009, characterize sit within private, non-profit and indefinite law. The board's office is located in Brasilia, it presents as an organizational structure: I- full council; II-executive board; III- supervisory board; IV- thematic chambers; V- thematic forums and an administrative secretariat.

Due to the extensive structure of the Federal Network of Professional, Scientific and Technological Education, the thematic forums are advisory bodies of the Thematic Chambers, composed of a representative of

each institution of the network responsible for the systemic actions related to the theme, these are organized by subject/demand:

- FDE - Forum of Teaching Leaders.
- IDI - Institutional Development Forum.
- FORINTER -Forum of International Relations Advisors.
- FORCAMPO Field Education Forum.
- FORPLAN - Planning Forum.
- FORGEP- People management forum.
- FORTI- Forum of Information Technology Managers.
- FORPROEXT - Forum of extension rectors.
- FORPOG - Forum of Pro-rector's research ,

The Forum of Pro-Rectors of Research, Graduate Studies, and Innovation (FORPOG) is an advisory body of the National Council of Institutions of the Federal Network of Professional, Scientific and Technological Education (CONIF). It is composed of a representative of each institution of the Federal Network, being Pro-Rector or Director responsible for systemic actions related to the theme.

Based on specific agendas, the group discusses and proposes actions related to the planning and development of Research, Graduate Studies and Innovation in the Federal Network, contributing to the Educational Policies of the country (2). The verticalization of professional education not only requires the definition of a new institutionality, but also which courses, modalities and levels of education will be prioritized (3).

Added to the differentials, the purposes and characteristics of the FI contained in law 11982/2008, to which we evidence:

> II - develop professional and technological education as an educational and investigative process of generation and adaptation of technical and technological solutions to social demands and regional peculiarities.
> III - promote the integration and verticalization of basic education to vocational education and higher education, optimizing physical infrastructure, staff, and management resources.
> IX - to promote the production, development and transfer of social technologies, notified lee aimed at preserving the environment (4).

These characteristics give aptitude and encouragement to research in THE, and promote the objective of this study that was to map the research groups that study the field of social technology in federal institutes.

"With a multicamp structure and a defined territoriality, the Federal Institutes assume a commitment to intervention in their respective regions, identifying problems and creating technological solutions for sustainable development, with social inclusion (5)".

To this end, this article is structured in this introduction, a theoretical framework for a conceptual understanding of what refers to the field of study of social technology treated here. In the following section the materials and methods used, results and discussion of the mapped data and finally some final considerations about the study.

II. THEORETICAL REFERENCE

Allowing a better theoretical understanding of the field of study of social technology is also a cross-cutting objective, since the term "social technology" have different meanings depending on the application and area of study. It is believed that knowing the concept defined for study can be a way to demonstrate its importance, its objective, and consequently a better understanding and visibility and, therefore, understand its main function, which is to promote social, economic and environmental development.

To this end, this reference seeks to present some concepts, which over the years have been attributed to the field of social technology and differentiate other understandings applied in several studies, always considering the Brazilian scenario and debate on the theme.

It is important to highlight that the understanding of social technology in this study differs from the concept of social media and/or networks and to results as internet-based tools to improve the "social" aspects of a given situation (usually access to information as a social impact)(6).

"Despite carrying a long and fruitful historical trajectory, especially with social movements and the solidary economy, the concept of social technology is still unknown by a part of the Brazilian and Latin American academic world[...] (7)". By social technology, according to the Institute of Social Technology - ITS, it is understood a "[...] set of techniques, transformative methodologies, developed and/or applied in interaction with the population and appropriated by it, which represent solutions for social inclusion and improvement of living conditions"(8)(7).

"The Social Technology Network - RTS includes in this definition, in addition to techniques and methodologies, products" (8). [...], replicable, developed in interaction with the community and representing effective solutions of social transformation"(9).

According to Dagnino, a reference author in the Brazilian scenario and a scholar in the field of social technology, he currently considers ST as part of the cognitive platform for launching the solidarity economy, called solidarity technology(7).

The concept that this study will adopt of Social Technology, will understand that:

> It would be the result of the action of a collective of producers on a work process that, due to a socioeconomic context (which engenders the collective ownership of the means of production) and a social agreement (which legitimizes associativism), which include, in the productive environment, a control (self-management) and a cooperation (voluntary and participatory type), allows a change in the generated product that can be appropriated according to the decision of the collective (10)(11)(12)

"Studies on Social Technologies are multidisciplinary and relatively recent; the concept is still the target of debates and tends to a polysemic character, inspired by different theoretical-methodological perspectives, although its variations keep essential elementsin common (13)". The development of social technology in its bulge comprises the combination of knowledge such as scientific, traditional knowledge, collective participation and therefore multidisciplinary and interdisciplinarity in research and extension are important tools because they allow interaction between the different lenses acquired from the technical-scientific training on the same theme (14)(8) . It is understood that Social Technology exists independent of universities, but some knowledge is necessary in the feeling of better empowering the subjects who make use of them to better harness their potentialities (8).

The development of research in the field of study of social technology with ownership of IF groups enable the knowledge of different themes through the collection of scientific data and the increase of possibilities of action of these same groups through projects of extension and direct contribution to the development of public policies.

"Universities and research institutions need to be encouraged to incorporate the social dimension into their research agendas, to promote citizen education; and greater integration of the social sciences and humanities with CT&I policies should be sought"(15).

In Brazil, Social Technology emerges to boost development in local communities, recognizing its role as producers of knowledge and technologies and promoting its social inclusion. In this sense, ST aims to contribute to the improvement of the quality of life of peripheral populations (8).

> Globalize knowledge and its use. Define the insertion of places in a network of human relations to value singularity in the midst of totality. Live a more supportive world. These possibilities of thinking, representing and proposing human relationships go against history. Unfortunately, there is a predominance of unbridled competition for markets and technologies, the incessant search for natural resources and the intense exploitation of workers, even in the face of the decrease in jobs(16).

The social function of daily research is important to enable this more solidary and collective walk, which are values advocated by the development of technology. For Sousa Santos (2012) we live in a phase of paradigmatic transition from modern science to postmodern science, which is characterized by the reconceptualization of science that exists in function of a new science that is envisioned(17).

Educational tasks at all levels must have prerequisites. Especially about professional and technological training, there is greater complexity, since, more than a purely academic work, the search for trainers who master the contents and work technical and learning methodologies according to concrete reality stands out. the appropriation of technologies, national, local and regional sustainable development and encourages the subjects of professional training to truly position themselves as subjects of reflection and research, open collective work and critical cooperative action, which translates into a reflexive approach that really works with technoscience (5).

This means overcoming the dichotomies between science/technology, conjecture/practice; overcome the compartmentalized view of knowledge and the in-depth appropriation of knowledge today at an increasingly accelerated pace of construction and demolition. It is this treatment of technoscience, in accelerated improvement, that brings to the process of knowledge construction the need to permanently install research as a pedagogical principle, besides being scientific (5).

III. Material And Methods
This study is characterized as a documentary research to which "enables the knowledge of the past and the investigation of processes of social and cultural change", (1) with a quantitative and qualitative approach and

delineated as exploratory. The search terms defined to obtain the data were the use of the words: social technology, singular and plural. A methodological pathway was elaborated to achieve the objectives of this study and the protocol in Figure 1 was followed.

Figure 1. Methodological path protocol

Elaboration: Authors, 2023.

The platform ofthe National Council for Scientific and Technological Development (CNPQ),because itis the beginning of the process of creating or implementing research activities in an institution, (18), was the place with the standardization of data that met the objective and cryptic of scientific rigor, in view of this, the use of search terms was defined for selection, in the plural and singular: and in the Portuguese "social technology and "social technologies".

"The Directory of Research Groups in Brazil (DGP) is the inventory of scientific and technological research groups in activity in the country. Thus, the existence of permanent research activity in an institution is a precondition for its participation in, and not the other way around (18)".

The search button page group was used: https://lattes.cnpq.br/web/dgp; the page was directed to the following address: http://dgp.cnpq.br/dgp/faces/consulta/consulta_parametrizada.jsf; in the parameterized query, the filters were used: current base; search term; exact search; search by search line; and was applied to obtain the data: group name, pesquia line name and search line keyword; considering the research groups with certificate status.

The first data acquired with search modeling was:

Table 1. General search of data on cnpq platform

Term	Group quantity
Social Technology	71
Social Technologies	195

Source: CNPQ. Elaboration: Authors, 2023.

After obtaining the so-called population data, they were exported to an electronic spreadsheet and the filter was applied: federal institute in the Instituição column, since the groups that have the social technology line of all teaching institutions were obtained.

Table 2. Refining data busca geral for only IF groups

Term	Group quantity
Social Technology	15
Social Technologies	38

Source: CNPQ. Elaboration: Authors, 2023.

To search for the data of each IF, the CNPQ platform was accessed, the search group button was the one defined. Because it is a study entitled mapping, the localities of the institutes as region and states were also considered as a category of analysis.

The data obtained were configured in spreadsheets and these allowed a better verification and verification regarding the format that the data are made available in the CNPQ Platform; it was found that the first quantitative ones did not refer to the groups, but rather the lines, with the repetition of the same group when there were more than one line of research.

After this finding regarding the data, the categorization was made using as reference the rows of research, and these data were transformed into figures (map charts, columns) and tables.

The final data obtained after the treatment in the worksheets were categorized as follows: number of rows per State/IF; predominant area by line of research; lines of research by Brazilian region; table with states that has the largest number of rows and/or groups: in the columns of the tables the data were presented by: rows of surveys; groups; objective of the line.

Regarding the data analysis, the documentary document was followed that according to the author (19) defines as follows "[...] a procedure that uses methods and techniques for the seizure, understanding and analysis of documents of various types, [...] and uses the document as an object of study.

IV. Result and Discussion

Considering the objective, the methodology and that in the development of a social technology results from the interaction between several actors with the objective of coping with real issues, in this case social, identifying what should be the beginning of this process, is a question mark, but the phases that can make up this development, such as scientific research, is a relevant point and thus the data obtained in this study that relates the Federal Institutes and the field of study of social technology.

The groups were mapped by state/IF, which made it possible to verify through figure 2, which region has the highest number and possibilities of developing both research and teaching and extension actions in the locality, based on the constitutional indissociably of the triad: "they will obey the principle of indissociably", the CF/88 prints when making university a conception that excludes the dual relations between the three functions (20).

And these studies make it possible to know through analyses and knowledge several constant in the multidisciplinary of researchers various results such as products, methodologies and or techniques, that is, social technologies aimed at territorial sustainable development.

Figure 2. Lines of if research groups in Brazil with interface to TS

Source: CNPQ.Elaboration: Authors, 2023.

Fifty-two lines belonging to thirty-four research groups were mapped, these presented as predominant areas: the human sciences with 36%; social sciences and applied with 22%; and in Third place the area of the exact sciences and the earth.

Figure 3. Predominant areas of the research lines of THE groups
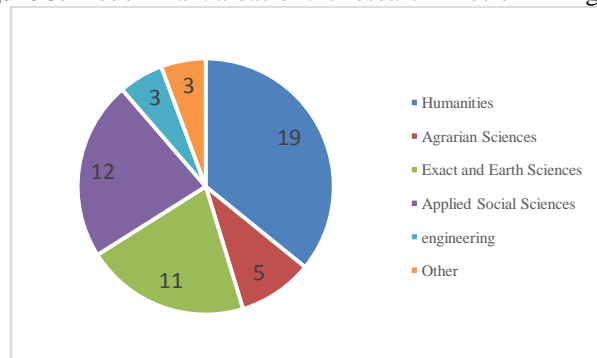
Source: CNPQ.Elaboration: Authors, 2023.

In the category of research lines by group, it was found three groups that emerged after analysis, with a greater number of research in the field of social technology, these belonging, first to IFAM, group: Education, Social Technologies and Development in the interior of Amazonas, with six lines; IFRJ, group: Center for Research in Gender and Social Technologies, four lines; and IFBA, group: ISA (Innovation in Applied Systems), with three lines.

Figure 4. Number of rows per TS interfaced search group
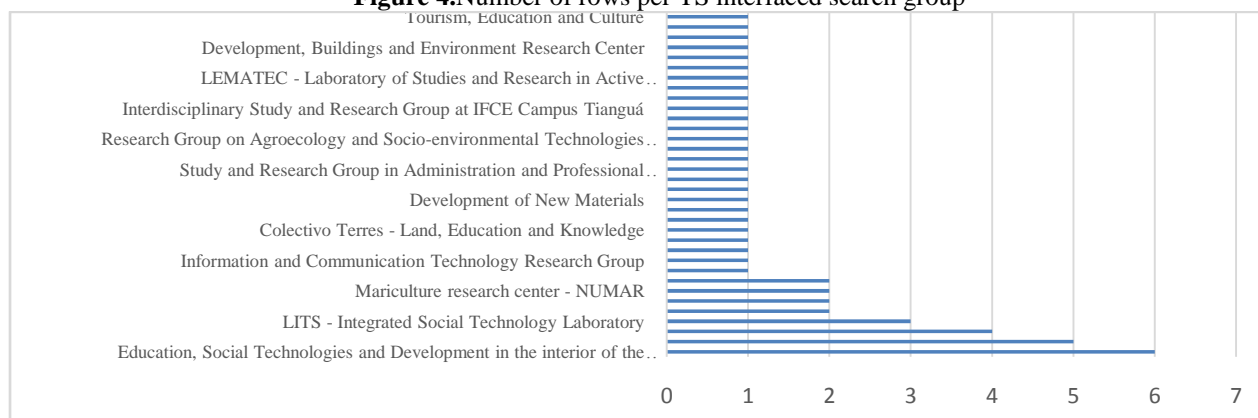
Source: CNPQ.Elaboration: Authors, 2023.

The category number of lines per region has made it possible to know the number of groups and which lines they develop, considering the territoriality and social issues of each region.

Mapping by region and knowing the profile of groups, it is understood that the data can enable the execution of partnerships, events, among other actions together to exchange experiences. This way, the figure 5, of the northeast region is presented below.

Figure 5. Lines of research groups by Region of Brazil: North East

Source: CNPQ.Elaboration: Authors, 2023.

The northeast region has nine states composing its region, in these are distributed eleven Federal Institutes (IF) on several campuses and these have a total of fourteen research groups, with nineteen lines, which study the field of social technology, with regard to the production, development and transfer of this type of technology. It was possible to verify that some groups have more than one line that studies the field of TS. The state of Bahia was the one that came out with twelve lines of research, distributed in ten groups of a single institute the Federal of Bahia, as shown in table 3, which in addition to the line, contains the name of the group and the objective of the line, information that is relevant to know the path and research interest that are being made and decided by the research groups.

Table 3. State of the Nordesregion with thelargestnumber of lines and/or research groups

SEARCH LINE	GROUP	GOAL OF THE LINE IN THE GROUP	IF
Biofuel and its co-products.	Center for Support for The Development of Technologies for Semi-arid	Development of technologies, processes, and products for the use of biomass, in its various forms, aiming at the generation of heat and energy.	IFBA
Applied Computing	ISA (Applied Systems Innovation)	This line seeks to study and develop computing techniques and investigate the possibilities of its application in real problems of various areas, contributing to the technological development of the region.	IFBA

Applied Computing to Health, Health Management, Technological Maturity in	Software Development Lab	This line aims to develop computational models and solutions for monitoring and acting in health in general and helping people with special needs and Computing Applied to Health, Health Management, Social Technologies, and Technological Maturity.	IFBA
Environmental education and social technologies	Research Group on Agroecology and Socio-Environmental Technologies - TecAmb	Without information about objective.	IFBA
Project Management	ISA (Applied Systems Innovation)	Search for knowledge, analysis, and implementation of frameworks for the management of projects and services of information technologies, as well as research of new concepts, methodologies, certifications, and standards, including automation of services and processes of information technologies.	IFBA
Management of Solidarity Enterprises and Social Technologies	Work, Development and Management Technologies	Study the limits and challenges of relations between Solidarity Economy, Social Technology and Development. Develop administrative, economic-financial, and associative management instruments of solidarity enterprises. Propose incubation methodologies for solidarity enterprises. Create and operationalize social technologies aimed at solidarity enterprises.	IFBA
Management of Solidarity Enterprises and Social Technologies	Work, Development and Management Technologies	Study the limits and challenges of relations between Solidarity Economy, Social Technology and Development. Develop administrative, economic-financial, and associative management instruments of solidarity enterprises. Propose incubation methodologies for solidarity enterprises. Create and operationalize social technologies aimed at solidarity enterprises.	IFBA
Complex and Social Networks, Dissemination of Knowledge, and Systems of	LABRASOFT - Software Development Laboratory	The line suggests the creation of innovative practices, adapting agile methods, for continuous analysis and improvement of diffusion, adoption and technological maturity, and sharing economy based on the theory of networks and complex systems, based on the exercise of understanding and improvement of the dissemination of knowledge and analysis of social networks.	IFBA
Information Systems	ISA (Applied Systems Innovation)	It seeks the development of basic and applied research in the subareas of Software Engineering and Databases, aiming to disseminate the production and use of methodologies, techniques, tools, and applications, which contribute to the development of computer systems.	IFBA
Information Technologies	ISA (Applied Systems Innovation)	Knowledge search, development and deployments of information technologies, IT infrastructure, computer networks and computing systems for the various market segments	IFBA
Low-cost technologies for family farming	SOCIAL TECHNOLOGIES	Without information about objective.	IFBA
Technologies, Subjects and Educational Processes	Interdisciplinary Study Group on Culture, Education and Society - GEICES	Without information about objective.	IFBA

Source: CNPQ.Elaboration: Authors, 2023.

"The Northern Region is composed of seven Brazilian states, the largest in territorial extension and the one that concentrates the largest green area in the country, with the Amazon Forest"(21), in these are distributed seven Federal Institutes (IF) on several campuses and these have a total of four research groups, with nine lines, which study the field of social technology, production, development and transfer of this type of technology.

Figure 6. Lines of research groups by Region of Brazil: North

Source: CNPQ.Elaboration: Authors, 2023.

The state of Amazonas is what has been made up with six lines of research, distributed in a particular group with researchers from the Federal Institute of Amazonas, as presented in table 4, which in addition to the lines, contains the name of the group and the objectives of the lines. As it is known "the North region is well known for two main aspects: it is the largest region of Brazil in terms of territorial extension and is the one that concentrates the greatest biodiversity thanks to the existence of the Amazon Forest and more than half of this forest is located in The Brazilian territory"(21).

Table 4. State of the Northern Region with the largest number of lines and/or research groups

SEARCH LINE	GROUP	GOAL OF THE LINE IN THE GROUP	IF
Students, Education and Citizenship in 18th Century Brazil	Education, Social Technologies, and Development in the interior of Amazonas	Studies on student protagonist have been limited to the 1960s, especially the cultural and political aspects of this action. In Brazil, research emphasizes student movements and their strategies of resistance and political struggle during the civil-military dictatorship. It aims to contribute to the historical understanding of the actions of students in a context little studied: the final decades of the nineteenth century, from the leading role, autonomy and active construction of student cultures.	IFAM
Gender and Domestic Violence Studies	Education, Social Technologies, and Development in the interior of Amazonas	Without information about objective	IFAM
History and education in the interior of Amazonas	Education, Social Technologies, and Development in the interior of Amazonas	Without information about objective.	IFAM
World of work and human formation	Education, Social Technologies, and Development in the interior of Amazonas	Without information about objective.	IFAM
Technology, Development and Sustainability	Education, Social Technologies, and Development in the interior of Amazonas	This line of research aims to stimulate research to solve local or regional problems that involve low-cost technologies that promote incremental or disruptive innovations for communities with sustainable bias.	IFAM
Social technology in the interior of the Amazon	Education, Social Technologies, and Development in the interior of Amazonas	Without information about objective.	IFAM

Source: CNPQ.Elaboration: Authors, 2023.

"The Southeast region is known for its economic strength and its large cities." A remarkable fact in the Southeast is its population. The region is the most populous in Brazil, with more than 90% of the population living in urban areas, being also the most urbanized. In addition, its economic indexes are high, as is the rate of industrialization (21)".

Nine research groups are distributed in the four Institutes, and in the region, there are nine IF in general located in the four states, these have a total of seventeen lines distributed in nine research groups, which study

the field of social technology, with regard to the production, development and transfer of this type of technology. It was possible to verify that some groups have more than one line that study the field of TS.

Figure 7..Lines of research groups by Region of Brazil: Southeast

Source: CNPQ.Elaboration: Authors, 2023.

The state of Rio de Janeiro was the one that came out with six lines of research, distributed in two groups of one of the IFRJ, as shown in table 5, and five rows are developed by the Group Center for Research in Gender and Social Technologies, information that is relevant to know the way and research interest that are being made and decided by the research groups.

Table 5. State of the Southeast Region withthehighest number of lines and/or research groups

SEARCH LINE	GROUP	GOAL OF THE LINE IN THE GROUP	IF
Applied social and environmental technologies	Multidisciplinary Study Group on Environment, Health, and Society	This line of research aims to study issues related to the analysis and solution of possible environmental problems associated with the paradigm of development present in capitalist society. In this way, it will cover issues related to the challenges and dilemmas of this development, as well as the role of science and technology in overcoming these problems.	IFRJ
Entrepreneurship, Solidarity Economy, Innovation	Center for Research in Gender and Social Technologies	It aims to support the formulation and implementation of public policies by encouraging the development and dissemination of technological and social innovations and appropriate the demands of economic enterprises in solidarity with social inclusion through income generation and work. In addition to contributing to the theoretical reflection in solidarity economy	IFRJ
Gender, Identity, and Inclusion	Center for Research in Gender and Social Technologies	It aims to expand reflections/actions in social spaces in the countryside and in the city, with emphasis on gender, culture, religiosities, violence, etc. Favoring equity in education, educational practices, ethnicities, spirituality (myths, beliefs, ancestry) cultural diversity, permanent duration, sustainability, Eco pedagogy, formation of eco educators linked to gender and ethnicity, through the history and memory of groups in vulnerable social and economic situation, in view of regional social history.	IFRJ
Production of Materials and New Technologies	Center for Research in Gender and Social Technologies	Research and production of new types of teaching materials accessible for teaching in various areas and knowledge; current information and communication technologies applied to accessible educational processes; innovation processes as a tool for different learning rhythms and styles.	IFRJ
Care technology for woman, child, adolescent and family	Center for Research in Gender and Social Technologies	It covers themes related to health care and practices in the distinct phases of human development in the health and illness process. Develops and analyzes methods, instruments, technologies, innovation, health and education. It considers the human being in the historical, social and cultural context.	IFRJ
Social Technologies	Center for Research in Gender and Social Technologies	It aims to contemplate the strategies of the enterprises in the implementation of social technology projects and in the feasibility of solutions to specific local problems, through Affirmative Actions, the theoretical and methodological aspects of core research and in the application of strategies to reduce social inequalities through their projects that reach dimensions of public policies, Education, Scientific Training, Knowledge Production, Culture, etc.	IFRJ

Source: CNPQ.Elaboration: Authors, 2023.

"The Southern region of Brazil has as one of its characteristics the strong European presence in its process of colonization and settlement. Thus, it has striking European traits in architecture, cuisine, population and even climate, because it is the only one in the country whose states are below the Tropic of Capricorn (21)."

Figure 8..Lines of research groups by Region of Brazil: South

Source: CNPQ.Elaboration: Authors, 2023.

Of the three states belonging to the southern region (Paraná, Rio Grande do Sul and Santa Catarina), where each of them has an IF, were mappedfive distinct groups and lines of research that study the field of social technology, these being belonging to three different IF. The State of Santa Catarina and the Federal Institute of Santa Catarina stood out in the region with three lines and groups.

Table 6. State of the Southern Region with the largest number of lines and/or research groups

SEARCH LINE	GROUP	GOAL OF THE LINE IN THE GROUP	IF
Science, Technology and Social Innovation	Applied Computing	Combining innovation with the social area using technologies for sustainable development.	IFSC
Social technologies	Renewable Energy	Without information about objective.	IFSC
Innovation processes and social technology	Multidisciplinary Research Group on Sciences and Geotechnologies	The products and processes resulting from the relationship between science, technology, and innovation (CT&I) run into society's ability to appropriate. In this sense, thinking about innovative products, processes and services that meet social challenges is the scope of this line of research. In this sense, it seeks to develop solutions with society, ensuring the dissemination and transfer of knowledge with those who demanded and collaborate directly in its development.	IFSC

Source: CNPQ.Elaboration: Authors, 2023.

"The Midwest region is relatively extensive, occupying approximately 19% of the Brazilian territory. However, its states — Goiás, Mato Grosso, Mato Grosso do Sul and Distrito Federal — are not very populated, having one of the lowest demographic densities in Brazil (21)."

There are five IF in the region, but no research groups established and registered in the CNPQ Platform with social technology interface were found for mapping and study.

V.   Conclusion

It is considered that the proposed objective of this study in mapping the research groups that study the field of social technology in federal institutes was achieved satisfactorily.

Some methodology modeling was necessary, such as considering the sites of the institutes and the FEDERAL CONIF Network, as a search site, but these platforms did not meet as the best option for searching for data. The choice of data search by the CNPQ Platform made it possible to know that there are fifty-two lines belonging to thirty-four research groups distributed in fifteen different institutes of four Brazilian regions.

The states of Bahia, Amazonas, Rio de Janeiro and Santa Catarina and their respective institutes are the ones that are the ones that are among the quantitative lines and/or research groups in the field of study of social technology.

The multidisciplinary was also evidenced when analyzing the predominant areas of research of these groups, naturally ratifying what requires the field of study of social technology that is the combination of different knowledge for the development of technology.

In addition to the categories analyzed here, as possibilities for studies it is suggested for future studies that the academic production of research groups is mapped with regard to articles, theses, dissertations. Other actions such as research and extension projects are also signaling as a possibility of deepening and knowledge of the collaboration of these research groups.

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