

Brazilian theses and dissertations on School Cartography in the period 2011–2020

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Abstract: School Cartography in Brazil has been constituted through the relationship between Cartography, Education and Geography. Thus, learning theories, teaching methods, the curriculum and teacher training are frequently debated in this field. To contribute to this debate, we aim to produce an inventory of the Brazilian production on School Cartography at postgraduate level in the period 2011-2020 through a documentary analysis. The objective is to find how many studies on School Cartography at postgraduate level were conducted and in which institutions, identifying the areas of knowledge in which these studies are inserted and recognize the theoretical-methodological contributions, the themes and segments of Basic Education addressed in the investigations. The delimitation of the documentary corpus will be built by searching the descriptors "School Cartography", "Cartography", "Teaching" and "Education" in the title, in the abstract or in the keywords in the Capes' catalog of theses and dissertations in the period 2011-2020. The inventory regarding the production will be organized according to the categories: a) representation of space; b) teaching methodology; c) technologies and production of cartographic teaching materials; d) teacher training and curriculum.

Keywords: School Cartography, state of the art, Brazilian Research

1. Introduction

School Cartography in Brazil has been constituted through the relationship between Cartography, Education and Geography. Learning theories, teaching methods, the curriculum and teacher training are frequently debated in this field. School Cartography requires the recognition of different areas that, in turn, contribute with their own elements and conceptual frameworks and paradigms. Pedagogy, Cartography and Geography have their own epistemologies and specific histories, which to some extent rebound on general histories of the development of science and its philosophical foundations, revealing a conception of the human being and the world.

The objective of the present study is to analyze the academic productions at postgraduate level regarding cartography in teaching between 2011 and 2020. The investigation was developed in the 'Cartography and Spatial Thinking in Geographic Education Research Group' at the University of Sao Paulo within the scope of the research 'The drawing as a representation system and spatial thinking: a cultural-historical approach in school cartography', funded by the Research Support Foundation of the State of Sao Paulo. This study consists in one of the objectives of this research: to outline the state of the art regarding School Cartography and learning theories.

Thus, this article presents the state of the art of the Brazilian studies on School Cartography, grounded in the analysis of the theoretical bases of theses and dissertations and from the understanding of the areas in which research on the relationship between cartography and teaching was

carried out. Recognizing the theoretical bases is critical to understand the possible paradigms, concepts, and the philosophical and pedagogical foundations. Additionally, knowing where the research is conducted both in academic areas and in the segments of Education - Early Childhood Education, Elementary and Secondary Education - allows the comprehension of Cartography interdisciplinarity.

When dealing with the use of maps and cartography in school, it is necessary to recognize the processes involved in the acquisition of language and the different means for representation of space, the scientific content, the concepts addressed and the procedures that can be performed. According to Lévy (2008, p. 153) "The map changes. It is set in motion under the fourfold influence of its referent (the spaces it seeks to represent), the concepts that contribute to thinking about those spaces, its specific techniques, and the uses of the map by society." If the world changes, the map changes. Thus, the question is: how does research accompany these changes in terms of theoretical and methodological foundations?

Although few research groups in Brazil are dedicated to developing scientific investigation on School Cartography, they have accumulated knowledge and experience that provide them with essential expertise. Several Geography postgraduate student's generations have already graduated with professors of those research groups.

Recognizing its theoretical bases can help studies in other countries and show the historical trajectory of this area in Brazil. In addition, within the scope of school practice, one can recognize which theoretical bases underlie a strong

school cartography that expands geographic reasoning in schools.

Recognizing the academic-scientific production at postgraduate level over a ten-year period may allow us to understand a research agenda on areas that are still under-researched. Thus, we present herein an inventory research based on document analysis.

2. Inventory research and school cartography

In Brazil, the studies about the development of topological, projective and Euclidean spatial relations conducted by Piaget and Inhelder (1956), in the book *Representation of Space in Children*, influenced School Cartography, which is based on: a) the graphic language and materials related to Cartography and its concepts; b) the learning theories and teaching methods related to curriculum and teacher training issues; and c) the social-spatial concepts and the relations established between society and nature studied in Geography.

The investigations about the learning developed at school brought to School Cartography new references based on Vygotsky's theory (1986) about the relationship between thought and language. The new problematizations presented the need to answer questions about language acquisition - considering the cultural and social environment - and the influence of teaching methodologies and teacher intervention on learning.

Thus, the debate about the theories of learning and child development in the field of School Cartography is ongoing, since it seeks foundations for teaching practices with cartographic language in school, which, in turn, is constituted by subjects and relationships in constant transformation. According to Almeida & Almeida (2012, p. 834), there are new answers about old questions related to cartography: "The old questions asked within communication cartography, in the 60's and 70's, have now new meanings: WHY making a map (reasons, purpose of the map), WHAT will be represented (map content) and HOW (graphic and cartographic language – design and resources), to WHOM (type of users, age, special needs), with WHICH results (efficacy evaluation of the whole process)."

Some studies about the state of the art of School Cartography in Brazil rely on data from the annals of the Cartography Colloquium for Children and Schoolchildren, created in 1995 by Regina Almeida and Rosângela Doin de Almeida with the aim of bringing together teachers and researchers focused on the studies of cartography in the school environment.

In their remarks on the 10th edition of the colloquium, Catling; Bednarz and Bednarz (2021, p. 362) highlight the importance of the event to the formation of school geography knowledge: "The colloquia series has continued across the years, and, in 2018, the 10th Colloquium was held. A key reason for this initiative was to foster and consolidate cartographic teaching and learning in the Brazilian school geography curriculum and to sustain it in higher education. The intention has to date

been successful. It was also suitable time for reflection and to evaluate research and development."

Cazetta (2018) notes that some important discussions on School cartography were developed in the colloquia: a) the addition of the word "school" in the 4th edition; b) the discussion on the terms cartography literacy and cartography initiation.

According to Cazetta (2018, p. 166), there would be a kind of narrative dispute within the nine editions of the colloquia held, so far, about what school cartography should be/is. Such remark urges us to understand the academic productions at post graduate level, not only the papers presented in the editions of these events, suggesting the creation of an inventory of studies in the field of School Cartography.

For this, the period between 2011 and 2020 was chosen for the analysis, since the 7th edition was held in 2011 and marked a significant change in the dominant themes addressed in the area (Cazetta, 2018). This edition presented new studies and references that seem to remain in more recent editions, such as the use of different languages and the presence of technology and imagination as part of children's cartographic production. Moreover, references for other areas were included, as Deleuze and Guatarri (1987).

Therefore, it is important to investigate in which universities and areas school cartography has been studied, considering its interdisciplinary character. The production of an inventory will serve as a basis for further research and will provide an overview of the most studied segments and themes, showing in which institutions such studies are being developed.

This type of study contributes to a scientific agenda, since the constitution of this documental corpus allows us to know what has already been produced at the graduate level, allowing an overview of the relationship between School Cartography and Geography teaching. It is based on the need to identify and reflect upon characteristics such as: theoretical references, geographical and historical distribution, and production contexts. The inventory type of research is relevant to the field of School Cartography because it can present contributions to epistemological inconstancy and imprecision in the definitions of concepts and categories, in addition to identifying which segments of Basic Education have developed most studies and which require more research.

The need to understand the academic production in recent years is justified by the presence of Brazilian academic productions in international publications, such as the one organized by Zentai and Reyes (2012).

3. Methodology

This research is based on a quantitative and qualitative analysis of theses and dissertations produced in Brazil in the period 2011-2020, i.e., a documentary analysis of theses and dissertations, aiming to present the state of the art of academic production in School Cartography. This type of research is defined by its bibliographical character, mapping the academic production of a certain area or

concept, and providing a qualitative analysis by highlighting the theoretical dimensions that have been prioritized. According to Ferreira (2002), such studies are recognized for performing a methodology of inventory and descriptive character of the academic and scientific production regarding a particular theme.

This research will allow us to identify and reflect about the areas of knowledge, with emphasis on the geographical and historical distribution, contexts of theoretical production and methodological contributions. To reach the general objective, the platform "Catálogo de Teses e Dissertações" (Catalogue for Thesis and Dissertations) from the "Coordenação de Aperfeiçoamento de Pessoal de Ensino Superior" (Coordination of Higher Education Improvement, CAPES, it is part of the Brazilian Ministry of Education) was used as the basis for the search, as it gathers the academic productions at post-graduation level. The first step will be to define which researches would comprise the documentary corpus.

This first delimitation will be made with the search for the entries "School Cartography", "Cartography", "Teaching" and "Education" in the title, in the abstract or in the keywords of theses and dissertations produced in Brazil and included in the Capes catalog of theses and dissertations. These three elements were chosen because, as Ferreira (2002, p.261) states, "the titles that refer to dissertations and theses inform the reader of the catalog of the existence of such research. Usually, they announce the main information of the work or indicate elements that characterize its content." The titles aim at the closest and most comprehensive representation to the purpose of the thesis and dissertation, its function is to represent the research accurately.

The key words reveal the main terms developed by the dissertation or thesis and consist of search mechanisms to find relevant articles about the theme to be investigated. Thus, Keywords are expected to represent the actual content and specify the field of knowledge in which the research is inserted. The abstracts display the most important points of theses and dissertations in this field, since they present the main objective, the methodology/procedure, the theoretical contribution, techniques, subjects and instruments of data treatment analysis, results and conclusions. Still regarding the abstracts, Ferreira (2002) highlights the importance of research based on abstracts, considering the nature of the material analyzed, the types of discourse (Bakhtin, 1992, 2010) and the notion of the material support in which each abstract is presented (Chartier, 1999).

To read the abstract as a type of discourse linked to the academic sphere, which has a certain purpose and specific conditions of production, is to understand it as a stable enunciate of its constituting elements (thematic content, verbal style and compositional structure). On the other hand, to understand them from the material support that houses them (online catalog) is to question the cultural object created to satisfy a specific purpose, to be used by a certain community of readers and that obeys certain norms

and specific conditions of production, according to Ferreira (2002).

Based on this conception, the abstracts will form a database of the period 2011-2020, and will be analyzed qualitatively to investigate the theoretical approaches and research subjects. The investigation comprises the following guiding questions: "in which segments of Basic Education is the research on School Cartography developed?"; "What are the theoretical contributions related to learning?"; and "In which areas and subareas is the research being developed?". We started with these qualitative questions, being aware that school cartography involves teaching and learning processes, which implies a broad approach. In this sense, some quantitative references of the productions in relation to the area and the segments of Basic Education can be traced.

The second steep consists in creating categories of analysis that will allow the understanding of the meanings given, and enable in-depth reflection on the data obtained. For the analysis of the dissertations and theses, the "content analysis" technique will be used, as proposed by Bardin (2009): 1) pre-analysis; 2) exploration of the material; 3) treatment of the results, inference and interpretation.

The study conducted by Almeida and Almeida (2012) which establishes the groups mentioned below, served as the basis for the categorization of the abstracts read and analyzed:

- a) Representation of space: theoretical contents regarding children's spatial representation, cartographic language, mental maps, and representation of social-spatial concepts;
- b) Teaching methodology: theoretical and practical contents focused on the search for didactic ways to teach cartography in schools, including cartographic initiation (cartographic literacy), special education (visual impairment), and teaching-learning of specific cartographic skills and concepts in the three levels of basic education;
- c) Technology and production of cartographic teaching materials: assignments on school atlases, scale models, multimedia cartography, maps and the internet, distance learning, remote sensing and geoprocessing;
- d) Teacher education and curriculum: research on knowledge and teaching practices, school daily life, culture, curriculum and teacher education.

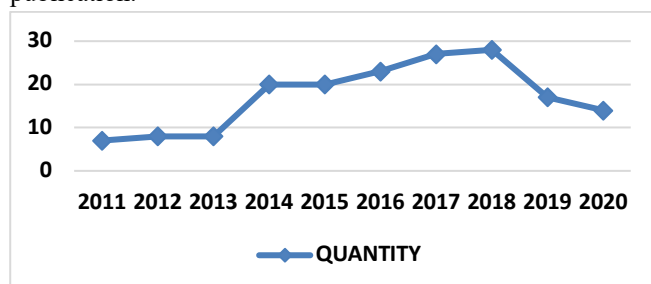
This thematic categorization will provide an overview of the subjects that have been widely studied and those that have been less studied. Thus, this classification follows the first stage of the delimitation of the documentary corpus, which will be discussed below.

4. Discussion

4.1 Delimitation of the documentary corpus

The delimitation of the documentary corpus was made by searching the descriptors "School Cartography", "Cartography", "Teaching" and "Education" in the title, the abstract and the keywords in the Capes theses and dissertations catalog in the period 2011-2020. After reading these pre-textual elements, a total of 172

researches on School Cartography at postgraduate level produced and published in the period were found, 132 master's dissertations and 40 doctoral theses. These productions were organized in Graph 1, by year of publication.



Graph 1. Research on school cartography published between 2011-2020

Based on the data shown in graph 1, the period between 2011-2020, displayed a notable growth in the production and publication of research on School Cartography in Brazil at the postgraduate level, with an increasing curve, especially between 2011-2018. The period of greatest growth occurred between 2014 and 2018. However, there was a considerable drop in the number of these published researches as from 2018.

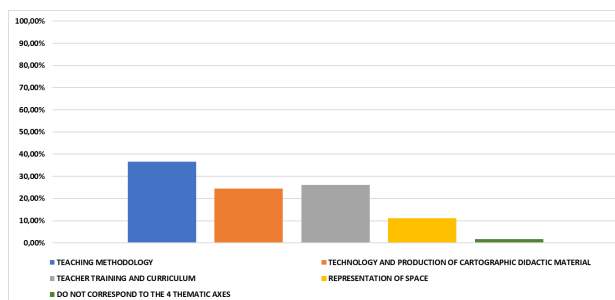
This drop in the number of research publications might have occurred for two reasons: 1) the significant reduction in the number of research scholarships for graduate studies by the Federal Government as of 2018, affecting especially the humanities area; 2) retirement of some pioneering and active postgraduate professors.

4.2 Categorization by thematic axis

After analyzing the abstracts of the theses and dissertations and reading the objectives and methodology, it was possible to classify them into the following thematic axes: a) representation of space; b) teaching methodology; c) technologies and production of cartographic teaching materials; d) teacher training and curriculum.

The analysis shows that some studies address both teaching methodology and teacher training and curriculum, others address representation of space and teaching methodology, and others cover technology and production of cartographic teaching materials and teacher training and curriculum. Although these studies deal with more than one thematic axis, there is always emphasis on one of the themes.

In the final categorization by thematic axes, the studies were systematized as follows: Representation of space (19); Teaching Methodology (63); Technologies and production of cartographic teaching materials (42) and Teacher training and curriculum (45). whose can be visualized in Graph 2 shows the distribution in percentage.



Graph 2. Research on School Cartography in Brazil between 2011 and 2020, by thematic axes

Most of the academic production is concentrated on the theme Teaching Methodology, with a percentage of around 40%, and 3 studies were not classified in the themes since they are documental-based studies on the state-of-the-art on School Cartography and do not have a specific theme to be related to the 4 thematic axes.

4.2.1 The subthemes: broadening the view

Throughout the analysis by thematic axis, we noticed the need to expand the detailing of the themes, so that we could know which themes have emerged and provided greater reflection on the cartographic language at school. Thus, we defined sub-themes of the thematic axes presented above, as shown in Figure 1.

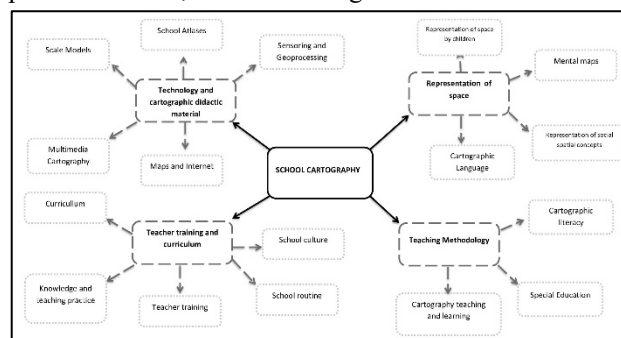


Figure 1. Thematic axes and subthemes regarding studies on School Cartography

The following data were obtained for the subthemes:

- Teaching methodology: 43 on teaching-learning of Cartography, 14 on special education, and 6 on cartographic literacy;
- Representation of space: 8 on spatial representation by the child, 6 on representation of social-spatial concepts, 4 on mental maps, and 1 on cartographic language;
- Technology and production of cartography teaching materials: 19 on multimedia cartography, 6 on maps and the Internet, 9 on school atlases, 1 on models, 6 on remote sensing and geoprocessing, and 1 on remote learning;
- Teacher education and curriculum: 29 about teacher education, 10 about knowledge and teaching practices, 6 about curriculum, and none about daily life and school culture.

The subthemes of the thematic axis Teaching Methodology display a greater concentration on Cartography Teaching-Learning. It is important to

highlight that the research on School Cartography in the subtheme Special Education not only contemplates people with visual disabilities with the productions on tactile school cartography, but also people with hearing disabilities, as the study by Mazzarollo (2017) and students with Global Developmental Disorder, as the research by Costa (2019). Regarding the subthemes Technologies and Production of Cartography Teaching Materials, research has a higher concentration in two subthemes: multimedia cartography and school atlases. In the thematic axis Teacher Training and Curriculum, research on Teacher Training presents the highest concentration, with 64.44%.

Thus, the axis of greatest concentration was "Methodology of teaching" due to the need to structure and seek ways to teach and recognize student learning about cartographic language, and the sub-theme "teaching-learning of cartography" also presented a significant concentration. This context reflects the many questions asked throughout the colloquia about what to teach and how to teach in the contemporary world. This reflects in the research on technology, especially in those on multimedia cartography, considering the different possibilities and interactivity in the classroom and the attendance of children and young people who increasingly use multimedia to get to know the world, the "Thumbelinas" (Serres, 2015).

Michel Serres (2015) talks about a new world emerging from the human thumbs, mainly those of young students, pressing keys, buttons and swiping screens of electronic devices. For Serres (2015), these new machines can deeply transform our ways of doing, thinking and creating, i.e., our intelligence.

The formation of spatial and geographic knowledge comes to be understood in the cultural environment and by the experiences of the subjects that develop and learn, e.g., one can consider the contemporaneity endowed by technologies because we need to understand how they influence the very way of thinking the space and how Geography classes can contribute to its conscious use and critical analysis. In this sense, the questions about the ways in which cartography is taught and how students form their knowledge permeate research on "representation of space by the child", presupposing cognitive changes, and investigations on "teacher training", subjects who are in constant transformation and dialogue with the world.

4.3 Categorization by Basic Education segments

For this categorization, all Basic Education stages were considered: Childhood Education; Elementary School (students aged 6-11 years old) and Middle School (12- to 15-year-old students)); and High School. In addition, we consider the existence of research conducted in Higher Education and some addressing more than one segment simultaneously. Before presenting the data, it is important to point out that the abstracts of some studies did not present details about the segment of Basic Education in which the research was carried out, or there were generic terms that did not provide the correct information. Some studies, for example, mentioned Basic Education without

any specification regarding Elementary or Middle School. Such differentiation is important, since they represent different cycles and the teachers present distinct formation: Elementary School teachers are graduated in Pedagogy, while Middle School teachers majored in specific areas, such as Geography.

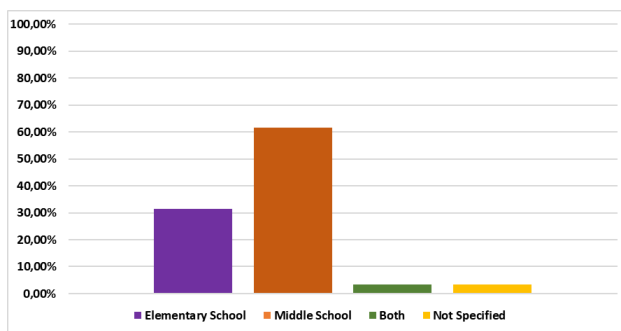
The analysis of the theses and dissertations showed that some studies focus on more than one segment of Basic Education, one of these studies addresses Middle School and Higher Education and two others High School and Higher Education. Additionally, 15 studies developed on the Higher Education segment focused on Initial and Continuing Teacher Education.

These studies included questionnaires, interviews and workshops with undergraduate students, especially Geography undergraduates. As an example of this sampling, we highlight the dissertation "School Cartography as a methodology in the training of Geography teachers in the Paraíba State University" by Leite (2017), which aims to analyze the cartographic language as a methodology in Geography teachers training. We highlight the dissertation "PIBID subproject cartographic literacy and teacher training in Geography at Unimontes", by Carvalho (2020), which aims to analyze Geography teachers' training through the Institutional Scholarship Program for Initiation in Teaching (Pibid), which focused on cartographic literacy in the State University of Montes Claros.

Among the research on cartography in Higher Education, there is an academic production focused on university curricula, especially in Geography courses, the thesis "The geography courses in public institutions of higher education in Paraná: an emphasis on the application of graphic semiology in the curricula of cartographic disciplines" by Rosolém (2016), which aims to analyze the cartography disciplines taught in Geography courses.

Some studies were not developed about a specific segment of Education, instead, they focused on discussions and theoretical-conceptual analysis about a particular theme, as the thesis "School Cartography in the perspective of a renewed geographic science: a socio-spatial issue" by Rossi (2019), which aimed to analyze geographical spatiality as a social conditioner in teaching maps.

Regarding the segments of Basic Education, the results were: a) 4 studies on Early Childhood Education; b) 86 on Elementary School; c) 16 on High School. As shown in Graph 3, most research on School Cartography published between 2011 and 2020 is directed to the Elementary Education segment, are concentrated in the Final Years, with 61.63%.



Graph 3. Percentage of studies on School Cartography in Basic Education segments

4.4 Categorization by area of knowledge, concentration and line of research

The bibliographic search revealed studies developed in the following knowledge areas: Geography (111), Education (37), Science (3), Mathematics (3), Social Sciences for High School (2), Geodetic Sciences and Information Technology (2), Environmental Sciences or Modeling in Earth and Environmental Sciences (2), Teaching History (1), Teaching and History of Earth Sciences (1) Teaching Natural Sciences and Mathematics (1), Science, Technology and Education (1), Teaching Exact Sciences (1), Teaching Science and Technology (1), Civil Engineering (1), Teacher Education (1), Other (4). The areas Geography and Education concentrate most studies, which demonstrates the relation mentioned hereinbefore. Nevertheless, it is important to highlight that School Cartography is an interdisciplinary field.

Regarding the concentration of the studies, the results were: Nature and production of space (Federal University of Goiás), Organization of space (Sao Paulo State University), Education (different universities), Human Geography (University of Sao Paulo), Physical Geography (University of Sao Paulo), Territory, Work and Environment (Federal University of Paraíba); Dynamics of space production and geography teaching (Federal University of Pelotas); Production of space and environment (Unioeste) and Teaching and History of Earth Sciences (State University of Campinas).

In ten years, of the 24 studies produced at the University of São Paulo, 19 were produced at the Department of Geography, representing 79.17%, 4 were defended at the Faculty of Education and 1 at the Faculty of Education of Ribeirão Preto. At São Paulo State University, 17 (89.47%) of the 19 published studies on School Cartography in the period were produced at Rio Claro Campus. While USP and UNESP concentrate most studies, we can observe an increase in the production of Federal University of Goiás, with 18 studies.

As for the line of research, some of them are associated with certain areas of concentration, which, in turn, are linked to graduate programs of the Universities in which the research was developed and published. We verified the existence of a specific line called Cartography, teaching and school cartography at UNESP. This is due to the history of research carried out in the graduate program in

Space Organization supervised by Professors Livia de Oliveira and Rosângela Doin de Almeida and the continuity of studies by other researchers working on cartography for children and schoolchildren.

4.5 The predominant theoretical and methodological contributions

The reading of the abstracts, introductions, objectives and methodologies of all the studies that comprised the documental corpus allowed us to identify other theoretical foundations than the expected ones - Vygotsky's Cultural-Historical Theory and Piaget's Genetic Epistemology. We noticed the presence of contributions not only related to theories of learning, but also to theories of geography, cartography, curriculum, and even theories and/or philosophical currents.

- 1) Learning theories: a) Vygotsky's Cultural-Historical Theory; b) Piaget's Genetic Epistemology; c) Vasili Davydov's Developmental Teaching Theory; d) David Ausubel's Significant Learning Theory; e) Reuven Feuerstein's Mediated Learning Theory; f) Cognitive Theory of Multimedia Learning; g) Andragogy (Adult Learning Theory); h) Gardner's Multiple Intelligences Theory ;
- 2) Cartographic theories: a) Jacques Bertin's Graphical Semiology; b) Brian Harley's History of Cartography; c) Kolacny's Theory of Cartographic Communication; d) Geovisualization or Cartographic Visualization; e) Geographic Cartography;
- 3) Geographic theories: a) Urban Space Social Production by Henri Lefebvre;
- 4) Philosophical theories and currents: a) Discourse Theory by Mikhail Bakhtin; b) Philosophy of Difference by Gilles Deleuze and Félix Guattari; c) Complexity Theory by Edgar Morin; d) Phenomenology;
- 5) Curriculum Theory: a) Curriculum Social Historical Approach by Ivor Goodson.

Among the 172 studies analyzed, theoretical-methodological contributions of 119 researches were found, a percentage around 70%, since it was not possible to delimit the theoretical contributions, since some of these studies did not use one or more main contributions. However, some concepts, contents, and methodologies can be highlighted: Social Cartography, Spatial Thinking, Thoughts by Paulo Freire, Pedagogy of Multiliteracies, Environmental Education, Decolonial Pedagogy, Webquest Methodology and Methodology of Reflective Teaching by Donald Schon.

Despite the diversity of recognized and delimited contributions, there is a predominance of Cultural Historical Theory, the theoretical basis in 50 of the 119 studies analyzed and the Genetic Psychology by Piaget appears as the second most used contribution, present in 26 researches.

The relationship between speech and concept formation is a common aspect among the studies based on the cultural-

historical psychology. The thesis "Spatial representations in games: what do child-players say?" by Benedict (2016), seeks to understand children's logic about relationships and spatial representations and the development of cartographic notions and perception of the environment, as well as how children express this cartographic knowledge and how this appears in their relationships with adults and other children in a cultural-historical perspective.

The dissertation by Godoi (2018), displays the theoretical contribution of Piaget's Genetic Epistemology in the title: "The construction of cartographic and geographic knowledge: a study about the representation of space and its relationship with social knowledge in the Piagetian perspective". It is important to note that many studies were found to use more than one theoretical and methodological guiding contribution, as Bittencourt (2011), based on Vygotsky and Bakhtin.

In School Cartography investigations, many other areas, such as Psychology, have contributed to the research design. The studies on School Cartography, present the relation between spatial notions and geographic knowledge, in the scope of teaching methodologies. The location, through the problematizations arising from Geography, allows us to understand the relationships that engender the spatial configurations and arrangements and enables the understanding of the position of a certain object or phenomenon.

5. Results and considerations

School Cartography is an important field of research established in Brazil in the 1970s with the studies by Livia de Oliveira. Its consolidation started in the 1990s with the Colloquiums on Cartography for Children and Schoolchildren.

Through the investigation of the state of the art regarding dissertations and theses on School Cartography between 2011 and 2020, we understand that this research field has been expanding in the Brazilian academic production and School Cartography in Brazil has been consolidated.

The categorization by thematic axes showed that several themes are addressed in the research on School Cartography and the systematization by subthemes in each thematic axis allowed us to broaden the understanding about this analysis. The research on School Cartography directs its studies, contemplating different educational segments, besides the segments of Basic Education (Kindergarten, Elementary and High School), such as EJA (Youth and Adult Education), Technical Education and Higher Education, showing once again its comprehensive and interdisciplinary aspect. Furthermore, the analysis by educational segments showed that Elementary School, especially the final years of this cycle, is the segment where most studies on School Cartography have been developed. On the other hand, the segment of Basic Education that presents the fewest studies is Children's Education. This can be explained by the fact that cartography is linked to Geography teaching, which begins to be taught from the sixth year of elementary school. The analysis by area of knowledge showed the

interdisciplinary character of School Cartography, despite the predominance of Geography and Education, the areas that concentrate most studies.

The organization of the Inventory of dissertations and thesis on School Cartography plays a very important role for the researchers of the Research Group on Cartography and Spatial Thinking in Geographic Education (CPEGEO), since it provides a basis for further research and an overview of the most studied segments and themes, and shows the institutions where the studies on School Cartography have been developed.

Through the present research and the questions about School Cartography, it can be stated that when we consider the development of geographic knowledge and spatial knowledge at school in academic research, the nature of the map must be considered, as well as its production, use and transformative and problematizing possibilities about reality. If the purpose is communication, it is an educational communication and involves a social function in the construction of geographic knowledge, since the formation of a geographic knowledge by subjects in their social practices is expected, and these practices are also transformed.

6. Acknowledgements

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