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Interdisciplinary research in a graduate program: what a South Brazilian corpus of mater's theses tells us? (2015-2018)

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ABSTRACT. In this article, we seek to point out the status of interdisciplinarity within the scope of graduate research in Brazil, with the interest of realizing which interdisciplinarity we are talking about, and which possible interdisciplinarities can be operated in institutional scope of graduate studies, in the process of knowledge production, as well as in the weaving of final papers. We used a corpus of 105 master's theses defended between 2015 and 2018 in the Graduate Program in Interdisciplinary Community Development at Universidade Estadual do Centro-Oeste, Parana, Brazil as our dataset. We collate this corpus with a broader bibliographic discussion on the challenges of the institutionalization of interdisciplinarity in Brazil. The article points to the permanence of tensions between disciplinarity and interdisciplinarity, as well as to the need for continuity of reflective analysis on the issue within the interdisciplinary graduate programs.

Keywords: interdisciplinarity; research; Brazil.

A investigação interdisciplinar em um programa de pós-graduação: o que um corpus de dissertações no sul do Brasil nos diz? (2015-2018)

RESUMO. Neste artigo, buscamos pontuar o status da interdisciplinaridade no âmbito de investigações de pós-graduação no Brasil, com o interesse de perceber de que interdisciplinaridade se fala e que interdisciplinaridades possíveis são operadas no âmbito institucional de pós-graduação, no processo de produção do conhecimento e na tessitura de textos de defesa. Para isso, utilizamos um corpus de 105 dissertações de mestrado defendidas entre 2015 e 2018 no Programa de Pós-Graduação Interdisciplinar em Desenvolvimento Comunitário, da Universidade Estadual do Centro-Oeste, Paraná em cotejo com uma discussão bibliográfica mais ampla sobre os desafios da interdisciplinaridade e sua institucionalização no país. O artigo aponta para a permanência de tensões entre disciplinaridade e interdisciplinaridade, bem como para a necessidade de continuidade de análise reflexiva sobre o tema no interior dos próprios programas de pós-graduação interdisciplinares.

Palavras-chave: interdisciplinaridade; pesquisa; Brasil.

La investigación interdisciplinar en un programa de posgrado: ¿Qué dice un corpus de tesis en el sur de Brasil? (2015-2018)

RESUMEN. En este artículo, buscamos puntuar el estatuto de la interdisciplinariedad en el ámbito de las investigaciones de posgrado en Brasil, con el interés de percatarnos de qué interdisciplinariedad se habla y qué posibles interdisciplinariedades se operan en el ámbito institucional de los estudios de posgrado, en el proceso de conocimiento. producción y en el tejido de los textos de defensa. Para ello, utilizamos un corpus de 105 disertaciones de maestría defendidas entre 2015 y 2018 en el Programa de Posgrado Interdisciplinario en Desarrollo Comunitario, de la Universidade Estadual do Centro-Oeste, Paraná, en comparación con una discusión bibliográfica más amplia sobre los desafíos de la interdisciplinariedad y su institucionalización en el país. El artículo apunta a la persistencia de tensiones entre disciplinariedad e interdisciplinariedad, así como a la necesidad de continuidad de análisis reflexivos sobre el tema dentro de los propios programas de posgrado interdisciplinarios.

Palabras-clave: Interdisciplinaridad; investigación; Brasil.

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Introduction

Interdisciplinarity is a multifaceted and contingent notion and operation, and the global interest in it fuels debates in different epistemic communities (Huutoniemi, Klein, Bruun, & Hukkinen, 2010). In Brazil, the problematization of interdisciplinarity incorporates important contributions. Among them, Ivani Fazenda (2017, p. 24) observes that talking about interdisciplinarity means to establish the debate within the scope of "[...] the impossibility of finding a single language to explain knowledge [...]", in projects that begin with "[...] doubt, inquiry, dialogue, exchange, and reciprocity" (Fazenda, 2017, p. 92). In this sense, Hilton Jupiassu (2006) refers to interdisciplinarity as an investigative 'spirit' that renounces the "[...] totalitarian manipulation of the discipline's discourse" (Jupiassu, 2006, p. 2). Maria Cândida Moraes (2010) argues that interdisciplinarity opens "[...] our epistemological cages [...]", in the context of a paradigmatic crisis that involves new relationships, interactions, emergencies, and knowledge networks.

These contributions are crucial when we look at the institutionalization of interdisciplinarity in Brazil in the 2000s. It was during this period that interdisciplinarity took the form of a national policy to support and encourage Graduate Programs (Doctorates and Masters) through the National Council for Scientific and Technological Development (*Conselho Nacional de Pesquisa e Desenvolvimento Tecnológico* – CNPq) and the Coordination for the Improvement of Higher Education Personnel (*Coordenação de Aperfeiçoamento de Pessoal de Nível Superior* – Capes) – the authority that approves, monitors, and evaluates the Brazilian Graduate system. From then on, interdisciplinary graduate programs began to be structured as long-term projects. Immediately, the institutional challenge was to promote interdisciplinary research at master's and doctoral level by overcoming deeply disciplinary traditions. At the time, Olívio Alberto Teixeira (2004) pointed out the problems and challenges of interdisciplinarity in a national sense, namely: a) the organization and coordination of research operations and their institutionalization; b) communication and language between researchers; c) scientific and epistemological problems, especially regarding the construction of interdisciplinary scientific objects, and d) the scientific validation of interdisciplinary research (Teixeira, 2004).

While interdisciplinary graduate programs have been able to gain a foothold in the institutional landscape of Brazilian science, the discussion of the four axes of problems and challenges proposed by Teixeira (2004) still remains. On the one hand, it is linked to global epistemological questions about interdisciplinarity; on the other hand, it seeks to assess how interdisciplinary the research carried out in interdisciplinary programs is (in other words, to what extent is it possible to say that research that calls itself interdisciplinary produces interdisciplinary results? What effects do organizational and institutional representations of interdisciplinarity have on research into interdisciplinarity? How advantageous is the label 'interdisciplinary' to research in its scientific and political dimensions?).

In this paper we seek to highlight the status of interdisciplinarity in the graduate level by understanding what kind of interdisciplinarity is being talked about and what possible 'interdisciplinarities' are being operated at the institutional level, in the process of knowledge production and in the weaving of defense texts. To do this, we used a corpus of 105 master's theses defended between 2015 and 2018 within the Interdisciplinary Graduate Program in Community Development at the Midwestern State University of Parana (PPGDC-UNICENTRO), in Southern Brazil.

We see that the scenario of an emerging program such as PPGDC, which in 2018 celebrated its fifth anniversary, serves as a microscopic locus for reflection on the controversies that occur in the very constitution of interdisciplinary and institutionalized graduate programs in Brazil: on the one hand, community development – the area of concentration – offers an agenda of themes, problems, and practices that emerge thanks to a supposedly instrumentalized interdisciplinarity (appeasing the disciplines, being appeased by them at the same time); on the other hand, the interdisciplinary status (open, fluid, and conflictive) depends, in order to be transformed into a methodological approach, on the stability offered by the area of concentration that appropriates it and in which will seek disciplinary answers to its problems.

Reflecting on the corpus on the status of interdisciplinarity in the construction of research between 2013 and 2018 (defended between 2015 and 2018) provides elements for visualizing the scientific, technical, and institutional controversies constituted in the webs of interdisciplinarity. It also enables us to delineate the epistemic dependencies between disciplinarity and interdisciplinarity between areas of the same field of knowledge or between fields. The provocation of these questions within a postgraduate program can shed light upon not the peculiarity, but the regularity of a dilemma that inhabits institutionalized interdisciplinary programs or initiatives: the need to produce valid and validated scientific knowledge (with

recognizability, refutability, and peer prestige) based on the negotiation between disciplinary stability and the theoretical-methodological instability of interdisciplinarity. Thus, the aim of this article is, by reading the scientific production of dissertations from an interdisciplinary *stricto sensu* graduate program, to understand the status of interdisciplinarity from a micro historic perspective and the binomial disciplinarity/interdisciplinarity from a perspective of reflection on the institutionalization of interdisciplinarity itself. We discuss this production in an attempt to map the status of interdisciplinarity in textual formulation, in terms of appropriations, problems, opportunities, and uses.

We start from the idea that the theses produced by PPGDC-UNICENTRO are marked by what we call 'an institutional intent towards interdisciplinarity.' Thus, the very name of the program carries the verbalization of interdisciplinarity as a point of articulation for research in the program's area of concentration. In this sense, we also consider interdisciplinarity from the point of view of a reflexive turn in the Humanities and Social Sciences (Aurell, 2013), which has served to build internal criticism of contemporary scientific fields based on self-awareness, considering the sophistication and fragmentation of knowledge itself between the end of the 20th century and the beginning of the 21st century. Reading these dissertations, therefore, means considering them in an eminently scientific dimension on the one hand (the texts are discussing particular themes, linked to the original interests of their authors), but also articulated to institutionalized lines of research, scientific laboratories, diffuse interests of supervisors, and expectations about the professional future of those who write – in an interdisciplinary way. As we are concerned with mapping the circulation of interdisciplinarity in these texts, which constitute the materiality of the institutionally constructed options in PPGDC, we consider dissertations to be documents that need to be compared with other classes of scientific and institutional documents. As historical documents of the process of building knowledge, they cover an intellectual trajectory, but they also represent narratives of academic experience, all historically contingent.

Our paper is divided into two parts. In the first, we discuss interdisciplinarity as a heterogeneous discursive field and its institutional appropriation in the context of graduate programs recently implemented in Brazil. We discuss the creation of new programs after 2010, considering PPGDC-Unicentro. Next, we look at the theses produced by PPGDC in the proposed period, considering the construction of these documents of scientific experience. We argue that it is impossible to talk about the status of interdisciplinarity in this scientific production without considering the field of interdisciplinarity as a field of conceptual, institutional, epistemological, and political dispute in a science that is under construction.

Interdisciplinarity in the Brazilian Graduate System

In Brazil, CAPES coordinates the Brazilian graduate system and pays for a large part of scholarships, grants, and infrastructure. Graduate Program proposals are submitted to preestablished areas of knowledge and are evaluated by experts. At CAPES, interdisciplinary graduate programs were recognized in 1999, with the creation of the then 'Multidisciplinary Area', renamed as 'Interdisciplinary Area' in 2008 (CAPES, 2013). At the time, several proposals could not be analyzed from a disciplinary point of view, and the commissions suggested the creation of an interdisciplinary area capable of judging them. CAPES set up the Multidisciplinary Programs Committee, which would incubate these new programs (Wasserman, 2003).

The proposal of interdisciplinary programs at the end of the 1990s follows the development of the discussion around interdisciplinarity in Brazilian education, which had already experienced some isolated programs at institutions such as University of São Paulo (USP). Some events had an impact on the creation of interdisciplinary graduate programs such as the creation of the National Laboratory for Scientific Computing (1998), with researchers from Universidade Federal do Rio de Janeiro, the National Institute for Amazonian Research, the National Institute for Space Research, and the Emílio Goeldi Museum of Pará. In the same year, the Angra Manifesto in Defense of Public University was published, criticizing the neoliberal turn in education policies in Brazil. The Manifesto outlined interdisciplinarity in the midst of a discussion of new curricular paradigms, aimed at broad, solid training and intellectual commitment (Brazilian Academy of Sciences [*Academia Brasileira de Ciências* – ABC], 2004).

The creation of the Multidisciplinary Area opened the second moment in the institutionalization of interdisciplinarity in Brazilian higher education (Elvio Pereira and Elimar do Nascimento, 2016). In this phase, which lasted until 2007, Brazil has witnessed the growth, recognition, and institutionalization of interdisciplinary practices. During this period, the national graduate system expanded interdisciplinary programs from 46 in 1999 to 228 in 2007 (CAPES, 2009).

Between 1999 and 2007, an accommodation process of the interdisciplinary programs emerged, regardless of some divergences and challenges for the Multidisciplinary Programs Committee. According to Julio Wasserman (2003), the first years of the interdisciplinary graduate policy were occupied by divergences resulting from the "[...] incomplete understanding of the interdisciplinary process on the part of some courses and by flaws in the construction of the committee's philosophy, which houses multidisciplinary courses that should be aggregated in monodisciplinary areas" (Wasserman, 2003, p. 116).

The then 'Multidisciplinary Area' understood interdisciplinarity as an exercise of interaction between teachers who must come from different areas of knowledge with common objectives. In the debate surrounding the official designation of the area itself, Wasserman (2003) recalls that the majority of the representatives of 105 courses who made up the committee in 1999 were opposed, even in 2003, to the inclusion of the term 'interdisciplinary' in the committee. Part of the argument for this position was put forward by the area's vice-coordinator at the time, Claudio Habert, who observed that "[...] although the objectives and themes should be interdisciplinary and specific, the methodologies should be traditional, as a way of adding credibility to the work. Otherwise science becomes superstition" (Wasserman, 2003, p. 117).

As the committee itself needed to better understand what interdisciplinarity is (or was), the expansion of programs meant that Capes was promoting seminars to articulate and rework the institutional philosophy around interdisciplinarity, approving new interdisciplinary programs, while at the same time building evaluation perspectives on them.

The field of Environmental Studies was one of the interdisciplinary areas that played a significant role in consolidating the interdisciplinary approach in Brazilian graduate system. It inaugurated what Pereira and Nascimento (2016) consider to be the third phase of interdisciplinarity, which began between 2008 and 2009 until 2011, when graduate programs were consolidated.

In 2009, a CAPES Area Report already evaluated this process of expanding interdisciplinary programs. Arlindo Philippi Junior and Pedro Geraldo Pascutti, in charge of this report, observed that "[...] over time, the procedures and instruments for evaluating interdisciplinary postgraduate programs have matured [...]" (Capes, 2009, p. 1). The courses performed a dual function at the time: while inducing innovative areas, they housed proposals for new courses from younger and more distant universities with graduate structures in the formation phase and difficulties in building up teaching density. The internal organization of the area at Capes was established in 2006 with the following thematic chambers: I - Environment & Agrarian; II - Social and Humanities; III - Engineering, Technology and Management, and IV - Health & Biology.

The report outlined interdisciplinarity as a challenge for the advancement of science and technology, taking care to construct the notion of multidisciplinarity in advance: "Multidisciplinarity is understood as a study that brings together different areas of knowledge around one or more themes, in which each area still preserves its methodology and independence" (Capes, 2009, p. 6). For Capes, then,

> [...] interdisciplinarity is understood as the convergence of two or more areas of knowledge, not belonging to the same class, which contributes to the advancement of the frontiers of science and technology, transfers methods from one area to another, generating new knowledge or disciplines and giving rise to a new professional with a different profile from the existing ones, with solid and integrative basic training (Capes, 2009, p. 6).

Based on the delimitation drawn up by CAPES, the agency set out the objectives expected of an interdisciplinary graduate program, with the aim of "[...] generating knowledge and the quality of the human resources trained being greater than the sum of the individual contributions of the parties involved" (Capes, 2009, p. 6). Although this institutional desire was quite broad, Philippi Junior and Pascutti (2009) point out that the challenges of these programs were: a) To promote openness to tackling new theoretical-methodological perspectives in research, teaching and innovation; b) To meet the epistemological challenges posed by theoretical and methodological innovation; c) To gradually promote the incorporation of interdisciplinary methodologies in faculty and student research projects; d) To deepen the defining characteristics of the concepts of pluri, multi and interdisciplinarity, and e) To identify channels for intensifying inter- and intra-chamber thematic dialog in the interdisciplinary area. It is important to note that, in 2009, Brazil had 248 interdisciplinary graduate programs, and another six programs were already approved to start in 2010.

The most recent and ongoing period in Brazil began in 2011, when interdisciplinarity reached undergraduate courses (Pereira & Nascimento, 2016). By 2013, 18 federal universities were already offering interdisciplinary bachelor's degrees in four major areas of knowledge: humanities, arts, health and science, and technology (Pereira & Nascimento, 2016).

During this period, CAPES changed the distribution chambers for graduate programs, breaking up Agrarian and Environmental Sciences and creating a new area, Environmental Sciences. Chamber I became 'Development and Public Policies'; II Social and Humanities; III Engineering, Technology and Management; IV Health and Biology (CAPES, 2013). Restructuring is an ongoing process because it accompanies the creation of new areas which sometimes end up absorbing existing programs. In the 2013 evaluation, Capes highlighted the existence of 297 interdisciplinary programs in Brazil, distributed as follows: 21.9% in Development and Public Policy; 30% in Social and Humanities; 23.6% in Health and Biology; and 24.5% in Engineering, Technology and Management (CAPES, 2013). Interdisciplinarity continued with the need for delimitation, and CAPES noted in the 2013 Area Report that the notion was related to "[...] new forms of knowledge production and training of human resources that take as their object of investigation phenomena that are placed between disciplinary boundaries" (CAPES, 2013, p. 11). It continues with "[...] the need to incorporate a broader rationality" (CAPES, 2013, p. 11).

The expansion of graduate programs in Brazil, up until this period, has been strong and continuous since 2000, without many apparent tensions between disciplinary and interdisciplinary proposals, to the extent that this tension was weakened as a result of investment in both types of graduate programs (Lima & Cortes, 2013).

It was in this context that UNICENTRO proposed the Graduate Program in Interdisciplinary Community Development in 2012. The proposal emerged at the convergence of Humanities and Health, with expertise from History, Psychology, Accounting Sciences, Speech Therapy, Education, Physical Education, Pharmacy, Nutrition, and Medicine. The program was structured with an area of concentration called 'Community Development', proposing three lines of research: a) Culture, human formation, and community development, aimed at research linked to cultural aspects, their relationship with human formation, and community practices, encompassing social representations, power relations and the biopolitical dimensions of individuals in their community; b) Health processes and community development, linked to practices and knowledge of health processes in human development, in their relationship with institutions, family, and community, with interdisciplinary actions in various forms of assistance and care; c) Environments, public policies, and community development, linked to environments and their implications for human development, namely the relations between environments and social practices in educational, environmental, work, public policy, and public health contexts, discussing approaches and conflicts between different spaces in which individuals participate.

The final version of the proposal incorporated two research lines: a) Culture, social practices, human formation, and community development, focused on social, cultural, educational, and environmental knowledge and practices and their relationship with human formation, encompassing subjectivities in the community context; and b) Human development processes in community contexts, focused on knowledge and practices of human development processes and the institutional, organizational, health, work, and public policy dimensions in their relations with the community.

Between 2013 and 2017, the program offered only the Master's course; then, as it had favorable evaluations, it was able to propose a PhD course, which was approved and began its activities in 2019. In the program's first phase, when it only offered a master's degree, 105 theses were produced. The program's perspective has been to bring the fields of knowledge of health and the humanities closer together, but it is important to note that the philosophical constitution of the course itself contains a hierarchy, insofar as it states that interdisciplinarity is presented in the sense of 'going beyond' health, combining other knowledge with it to interpret phenomena (APCN-PPGDC-Unicentro, 2017). The research carried out demonstrates the interpretative heterogeneity of interdisciplinarity and, in this sense, allows us, at a local level, to understand the dynamics that take place when formulating scientific policies and academic training, but especially the levels and meanings of the appropriation of scientific languages, perspectives, or approaches.

Interdisciplinarity as a heterogeneous discursive field

When discussing interdisciplinarity as an epistemic situation, Julie Klein (2000) states that its emergence over the course of the 20th century is linked to the shaping of the contemporary status of knowledge in the clash between normal, hierarchical, rigid, and elitist science and another, post-normal, democratic, and participatory science. The debate on the subject brings together forces such as the merit of practical reason and the defense of universal truth, relevance, and excellence, or even the mathematization of scientific language. The author also notes that interdisciplinarity is the result of opportunism in the production of knowledge, which happens in two ways: when scientists seek out existing knowledge and resources in order

to produce new ones, or when users of knowledge (such as politics and industry) surround opportunities to acquire knowledge by injecting resources to obtain solutions to particular problems. In the first case, interdisciplinarity is the recombination of existing specialties. In the second, it is a path to non-scientific knowledge objectives.

These tensions between knowledge and epistemological positions in relation to interdisciplinarity have been systematically considered in recent work. Peter Weingart and Nico Stehr (2000) compiled the discussion on interdisciplinarity on the threshold of the 21st century in a work that was concerned, at the same time, with presenting a historical and contemporary discussion of the subject. Historian Julie Klein (2000), one of the leading global authorities on the subject, opened the collection by giving space to what she called the vocabulary of interdisciplinary science.

Klein (2000) opened her chapter by drawing attention to the relevance of the debate on interdisciplinarity, already established in the mid-twentieth century, especially consolidated by what he called the 'new contract' between governments and science at the beginning of the Cold War, which demanded new organizational structures, such as technology transfer offices, consortia, contract research, and companies. This mid-twentieth century perspective increased the importance of a problem-solving, instrumental, and not necessarily interdisciplinary science. A history of the debate surrounding interdisciplinarity in the second half of the 20th century positively highlights the standardization of disciplinary relations in this scientific stance, namely: a) the development of links using the perspective of one discipline to modify the perspective of another; b) the recognition of new organizational levels of science; c) the use of research techniques from one area to develop theoretical models in another; e) the development of a new theoretical scope to reconnect research in separate domains in an attempt to integrate them (Klein, 2000).

This debate proposed by Klein (2000) takes into account the multiple facets of interdisciplinarity, such as the adequacy of spatial metaphors in the constitution of this knowledge (borders between areas), organic (intersections) and hybridity (zones of negotiation between areas). It also highlights the ways in which the resolution of research problems are proposed, considering a typology of these problems, which includes the first type (intellectual problems in a traditional discipline), the second type (intellectual and multidisciplinary problems, which cannot be solved in just one field) and the third type (multidisciplinary problems that require a joint solution and demand public policies).

In the dialogue that took place throughout the 20th century, interdisciplinarity ended up becoming a paradoxical discourse, in which disciplines were made pejorative due to their rigor, because they were the private property of science, while innovation was the way out (Weingart & Stehr, 2000, p. 25). Talking about interdisciplinarity implies talking about new organizations of scientific work. In this sense, Weingart observes, as does Klein (2000), that considering interdisciplinary activities does not only mean criticizing disciplinarity, the boundaries established between fields of knowledge, since these spatialities do not survive.

A closer look at the construction of interdisciplinarity proposed by Potthast (2010) suggests, however, that the stability sought by disciplines is disrupted by disciplinarity itself, to the extent that fields of knowledge have their own internal divisions (Potthast, 2010). Continuing the discussion, Osborne (2011) points out that the external boundaries of fields of knowledge are also porous. In the constitution of disciplinary knowledge, crossing borders is an intrinsic element in the formation of disciplines, and at the same time constitutes epistemic innovation, since the demarcating criteria of disciplines (such as problems, materials, methods, theories, and concepts) also connect different disciplinary practices.

Joe Moran (2002) observes that the critique of the disciplinarity of scientific disciplines belongs to the disciplines themselves (Moran, 2002) and that this superficial level of reading lies in the disputes surrounding the prefix 'inter', which carries ambiguities. Although it forges connections, it also allows for the construction of non-disciplined and non-disciplinary spaces in science. In this sense, Moran (2002) considers that ambiguities are opportune because they allow for the production of new forms of knowledge. Julie Klein (2005) has also discussed the problem of institutionalizing interdisciplinarity at the level of teaching and research at the university level in the USA.

Klein (2010) takes up the debate around interdisciplinarity, outlining the arguments in favor of this approach, considering the transition between an image of a linear structure of knowledge that has been replaced by a 'network' or 'web' scenario, with the aim of transposing the idea of fragmentation and segmentation with a more vivid idea of connectivity, integration, linking, and grouping. This shift has

therefore reinforced images of relevance, applicability, and explanation, although the organization of interdisciplinarity happens in different ways in each field of knowledge (Klein, 2010, p. 5). The author took the opportunity to discuss the conditioning factors of interdisciplinarity from the US perspective, highlighting five of them, namely: 1) the inherent complexity of nature and society; 2) the desire to explore problems and issues that are not confined to a single discipline; 3) the need to solve societal problems and 4) the power of new technologies (Klein, 2010). Klein (2010) has thus highlighted disciplinary methods that have been popularized in various fields, such as oral history, biochemistry, cognitive sciences, statistics, and econometrics. Another emergence is particularly emphasized: new communities of research practice, partly due to the process of expanding and bringing together fields of work, which has even formed a pidgin zone of scientific communication, which is the new language of the scientific subculture (Klein, 2010).

Klein's (2010) observations, in this sense, allow us to consider the maturing of the epistemological discussion on interdisciplinarity and are in line with what Andrew Barry and Georgina Born (2013) call two contemporary discursive inflections on interdisciplinarity. The first claims that it offers new techniques or knowledge practices to society and the second argues that it is capable of forging better proximity relations between scientific research and innovation. Barry and Born (2013) emphasize that, when discussing interdisciplinarity, it is necessary to avoid understanding it as a novelty, as well as considering it only from the point of view of institutional policies in the scientific field. It is precisely these two precautions that, when not taken, generate polarization based on superficial judgments about the creative or repressive status of a given field of knowledge (Barry & Born, 2013).

In this sense, the authors suggest methods of interdisciplinarity, such as integrative synthesis and subordination (which involves hierarchies of scientific work).

Jerry Jacobs (2014) points out the challenges of interdisciplinarity for the institutional structure, forged historically in the first half of the 20th century, which affects professional training, public and private funding, hierarchies, and social divisions of labor within higher education. On the other hand, Felicity Callard and Des Fitzgerald (2015) highlight the 'experimental entanglements' that can emerge from the production of interdisciplinary knowledge, by discussing what they call the pragmatics of interdisciplinary collaboration, which involves well-known strategies such as co-authorship, but also co-experimentation and co-organization of projects.

It is also important to consider that the clashes around interdisciplinarity are close to academic structures in particular, insofar as universities and their departments tend to remain watertight. This is the difference when universities are compared to industries, where the obstacle to dialogue between different areas of expertise and the development of new fields based on the defense of disciplinarity would be fatal to the respective enterprises (Raynaut, 2014).

To the extent that everyday emergencies enter the university sphere, they end up pushing already consolidated fields of knowledge into crises and the need for change, provocatively building arenas of uncertainty, many of which fall on the basis supposedly designed to eliminate controversy: the curriculum. The performativity of academic knowledge, in the context of a crisis of compartmentalization of knowledge characteristic of modern science (Morin, 2000), moves in step with the imperative of convergence and continuous integration of knowledge (Santos, 1988), without, however, weaving an unequivocal language and procedures for transformations. At the same time, interdisciplinarity is both a starting point and an open door for the development of a paradigmatic change in the relationship and performance of knowledge.

On protocols about interdisciplinarity

When analyzing interdisciplinarity, Huutoniemi et al. (2010) have recently proposed a typology and some indicators, starting from an epistemologically organized point of view. The authors present categorizations of interdisciplinary research from a historical perspective in order to consider the need to construct new hybrid indicators for evaluating interdisciplinarity. In this sense, they show the focus of interest in disciplinary integration, already categorized in the 1970s as multidisciplinarity, pluridisciplinarity, interdisciplinarity, and transdisciplinarity, when starting from the development of scientific knowledge. When starting from the maturation of interdisciplines, it was possible to think of various types of interdisciplinarity, such as indiscriminate, auxiliary, composite, supplementary, unified or even pseudo. From the perspective of the distance between fields of knowledge, the authors present categories such as unification of knowledge, accumulation of knowledge, or even different thinking around

the same scientific interest. Among interdisciplinary practices, the authors find categories such as 'common group learning', 'negotiation', 'integration through leadership', eclecticism, holism, informed, synthetic, conceptual, generalist, contextualizing, methodological, charismatic, heuristic, pragmatic, endogenous, or exogenous interdisciplinarity (Huutoniemi et al., 2010). There is also a favorable shift in the reading of interdisciplinarity when the notion of 'discipline' is shifted to the notion of 'field', which gives it more permeability while maintaining certain internal sovereignties.

The suggested typology and indicators for interdisciplinarity seek to distinguish what is integrated, how this integration is carried out and the reasons for adopting an interdisciplinary approach, as shown in Table 1.

Table 1. Typology and Indicators of Interdisciplinarity.

Typology	Indicator	Description
Scope	Wide	Integration between conceptual and distant areas (e.g. law and engineering, cultural studies and medicine, philosophy and neurology). Interactions are really challenging due to epistemic heterogeneity.
	Narrow	Integration between areas inside a same field. This interaction is regular; there are no epistemic challenges.
Types of interdisciplinar interaction	Encyclopedic	Juxtaposition of research fields is determined by the research topic. There is no interaction between researh areas; research solves problems segregated by areaonceitos de um ou de outro campo, indiscriminadamente.
	Contextualizing Interdiscipinarity	Multidisciplinary context of knowledgement production, but the interaction is limitted by the research problem. Heterogeneous team with the same interest.
	Composite	A group is formed by different fields that are combined in a modular way to produce new knowledge. Even so, the interaction between the fields tends to be technical.
	Empirical	It integrates different types of empirical data in order to investigate relationships between phenomena observed in different fields of knowledge, or to combine hypotheses or solve an interdisciplinary problem. Ex.: environmental humanities..E.g. environmental humanities.
	Methodological	Different methodological approaches are combined in a new and integrated way. Methods are not just juxtaposed but developed to incorporate an interdisciplinary reading.
	Theoretical	Research synthesizes or contrasts concepts, models or theories from more than one field of knowledge to develop new theoretical tools for interdisciplinary analysis.
Types of goals	Orientada epistemologicamente	Interdisciplinaridade conceitual ou endógena. Integração de várias perspectivas disciplinares é feita para levar a um entendimento mais amplo de um fenômeno.
	Instrumentally oriented	It seeks to solve an extra-scientific problem or develop a product or policy. Interdisciplinarity as a practical solution to complex problems (does not necessarily constitute an interdisciplinary approach).
	Mixed orientation	It seeks to advance knowledge and/or solve a scientific or non-scientific problem, treating them in the same way. The interdisciplinary perspective serves as a diagnosis and, at the same time, an explanation of a problem as well as in the development or implementation of solutions. To qualify an investigation as having a mixed orientation, it is necessary that an epistemological and instrumental interdisciplinarity be strongly present in the text, at the same time, in both the theoretical-methodological reasoning and the objectives.

Fonte: Huutoniemi et al. (2010, p. 83).

In Table 1 it is important to note that, from the point of view of the scope of interdisciplinarity, i.e., what is integrated when interdisciplinary research is carried out, the 'restricted' indicator includes research in the same major area of knowledge. In this sense, the interaction of concepts, categories of analysis or research tools that takes place in the formulation of a research project is not exceptional and is not very strange. This restricted characterization of interdisciplinary interaction has a profound relation with an encyclopedic dimension in the construction of investigations of this nature, even more so because the areas end up promoting only juxtapositions of fields of knowledge without the construction of new notions or creative and interpretative processes. Perhaps this relation between restricted interdisciplinarity and an encyclopedic approach has implications for the epistemological and theoretical-methodological dimensions of research, with a consequent link to the formulation of research problems and results. On the other hand, other indicators and forms of interdisciplinary interaction do not present as many precautions as the aforementioned indicator, because they require greater closeness, theoretical-methodological and

instrumental flexibility between fields of knowledge, and also constitute 'riskier' investigations, new fields of knowledge or different approaches to a given theme or field.

There are no appropriate protocols for measuring 'interdisciplinarity' in interdisciplinary programs, as the monolithic definition of interdisciplinarity is fragile. However, this does not mean that research into some of the aforementioned characteristics of interdisciplinarity cannot and should not be carried out, especially since analytical exercises on the subject serve to understand and reflect on the possibilities for progress and the challenges that programs of this nature can present.

In this sense, Vanessa Satolo (2016) compared two interdisciplinary programs in the area of agribusiness, one at Universidade Federal da Grande Dourados (UFGD), in Dourados, Mato Grosso do Sul, and the other at the Universidade Estadual Paulista 'Júlio de Mesquita Filho' (UNESP), in Tupã, São Paulo, looking at perceptions and publications produced by the respective teaching and student bodies. Satolo (2016) noted that in both universities the ease of dialog between peers from different areas of knowledge has been considered a non-contentious point.

However, this situation is no longer the same when it comes to equalizing or working together on the basis of concepts, and the greatest difficulty lies in adopting new methodologies, i.e., methodologies from another area, in a given piece of research (Satolo, 2016). Terms such as "[...] difficulty linked to the change in the way of structuring reasoning [...]" (Satolo, 2016, p. 106), or guiding students from different areas, emerge from the very construction of new methodological perspectives.

Added to this is the fact that interdisciplinary didactic practice is also a very important challenge for both teachers and students, who find it very difficult to understand syllabuses from other areas (changes in the way they structure their reasoning). Finally, there is a convergence found by Satolo (2016) which concerns the idea that it is urgent for programs that teachers and students are receptive to new concepts, new methodologies, as well as integral or systemic or holistic views of their objects of investigation.

Jalcione Almeida et al. (2006) observe, based on an experience report, that the establishment of epistemological dialogues is fundamental in the constitution of interdisciplinarity, especially to equalize what they call the "[...] unequal perseverance of researchers" (Almeida et al., 2006, p. 122). This is so because:

> Even if the requirement of certain research principles is accepted by a large part of the scientific community, it does not guarantee close collaboration in interdisciplinary work when difficulties arise in terms of cooperation between researchers. It can be said, without risk of error, that the history of the production of knowledge, in Brazil as in the world more generally, overflows with examples of strident failures of this type of experiment, with few exceptions escaping the rule (Almeida et al., 2006, pp. 122-123).

According to Almeida et al. (2006, p. 133), "[...] the scientific field tends to reproduce a representation of the sciences in which each discipline or field of knowledge establishes a subfield of action, in which researchers develop a habitus that is their own and where objections are rarely allowed [...]." In this sense, the risk of cloistering researchers is strong as they react intergenerationally to the challenges posed by epistemological confrontation, due to the fear of making the implosion of experience susceptible when debating two different epistemologies (Almeida et al., 2006). In other words, experienced researchers do not want to give up their certainties and their position in a given field or subfield of knowledge, while researchers in training do not yet have well-defined themes or research.

Part of these choices, which have been formed from the very history of interdisciplinary knowledge in the country, is perpetuated when trajectories are adopted that, at least apparently, present fewer epistemological tensions, as when we observe a corpus of 105 dissertations from a single program that is made up of distinct areas of knowledge such as Applied Social Sciences, Human Sciences and Health Sciences. More than 50% of the total reside in just one of the fields and that the majority of the products were developed by professionals from the same major area of knowledge. The conformation of a restricted identity of interdisciplinarity, in this sense, would even lie in the adoption of academic language limited to a given major area of knowledge with little interaction with others.

In this sense, the establishment of dialogues between peers, which is considered easy, paradoxically coexists with the greater or lesser perseverance of researchers or advisors in the interdisciplinary challenge, insofar as it sometimes seems difficult to break with the field of origin in an attempt to adopt concepts or methodologies from other areas. Thus, part of the interest in interdisciplinarity lies in the least contentious point of an interdisciplinary research project, which is research aimed at pointing out contributions, evaluating policies, reading efficiency, identifying professional experiences and practices, replicating

established protocols in a given area, among others – and this concern has been noted nationwide (Almeida et al., 2006; Schmitt, Travassos, Fialho, & Remor, 2006; Martin, 2011).

A significant part of these findings can be seen between 2015 and 2018, when 105 master's dissertations were defended at Unicentro's PPGDC. Of these, 38 were in 2015, 31 in 2016, 15 in 2017 and 21 in 2018. Of these, 36 fell under Research Line 1 (Culture, Social Practices, Human Formation and Community Development), 63 under Research Line 2 (Human Development Processes in Community Contexts) and 6 were classified as 'mixed'. In the case of the undergraduate degrees of the master's students who defended their degrees between 2015 and 2018, there was a predominance of Health Sciences (34.3%, or 36 texts) and Human Sciences (30.5%, or 32 texts), followed by Applied Social Sciences (27 texts) and other areas.

The prevalence of training in Health is also evident among the program's professors (56.2%), followed by Human Sciences (19%) and Social Sciences (16.2%) (Table 2). It should be noted, however, that the proportion of professors from the health field is much higher than that from other areas, comprising more than half of the papers defended in the period. This process is related to the fact that 65% of dissertations have supervisors and students in the same major area of knowledge.

The construction of research in the same major area, including the links between the origins of students and supervisors, creates a scenario in which, in terms of the scope of interdisciplinarity, the majority of research is restricted (99 dissertations, compared to 6 that were considered mixed). When we talk about the objective of an interdisciplinary investigation, considering the corpus of dissertations we have, in the light of the protocol used, we see that only one dissertation is epistemologically oriented, 13 are methodologically oriented and 91 of them are instrumentally oriented. Interdisciplinarity, when thought of instrumentally, ends up acquiring other features, such as a reductionism of its meaning to more vague notions such as "[...] promoting interdisciplinary knowledge in health teams" (D7, 2015, p. 10).

In dissertation D9 (2015), interdisciplinarity is seen as an 'awakening of interest' linked to local development and problem-solving, since its aim was to "[...] investigate whether the ecological ICMS transfers were used effectively by the municipalities in the south-central region of Paraná" (D9, 2015, p. 8). As a result, the research carried out follows a path in which interdisciplinarity is mostly understood from an encyclopedic point of view (78 texts), having reinforced this trend since the first dissertations were defended in 2015 (Table 2). With regard to the restricted scope, it can also be seen that this trend has been accentuated until the total disappearance of the broad interdisciplinary scope in the texts defended in 2018.

Table 2. Type of interdisciplinar interaction/year.

Year	Encyclopedic	Contextualizing ID	Total
2015	28	10	38
2016	21	10	31
2017	12	3	15
2018	17	4	21
Total	78	27	105

Souce: the authors.

From the research orientation standpoint, there is a preponderant absence of epistemologically oriented interdisciplinary work (only one dissertation defended in 2017), a hegemonic field of instrumental orientation in all the years in which the dissertations were defended, and rarely any methodologically oriented research (7 in 2015, 2 in 2016, 1 in 2017 and 3 in 2018). Dissertation 19 (2015), when working with breastfeeding from the perspective of health professionals, ended up incorporating methodological bridges in the sense of working with discourses of medicalization of this process, in a dimension close to anthropology, with the use of life histories. Others believe that interdisciplinarity is the sharing of concepts and methods of related knowledge, as is the case with Pharmacy, Medicine, Nursing and Nutrition in one sense, or History and Geography, Law and Business in another.

When we cross-reference undergraduate education and the major area in which the supervisor works, we can see that, between different majors in the supervisor-supervisee relationship or in the same area, there is a predominance of texts with encyclopedic interdisciplinary interaction (57 texts in the same area and 21 in different majors). However, in the case of different majors, the proportion of contextualizing texts is much higher (16 out of 37, which represents 43%, while 11 out of 58 represents only 18%). In this sense, dissertation D9 (2015), when discussing the practices of community health workers in relation to the special needs of people with cerebral palsy, notes that the questions raised in the research were in the context of

"[...] interdisciplinary work, living together with health and education professionals". Thus, interdisciplinarity was seen as "[...] cooperation between areas" (D9, 2015, p. 38).

Final remarks

The instrumental or encyclopedic dimension of interdisciplinarity, and especially the perspective of problem-oriented research, as is the case with several dissertations defended in the program that we used as a basis for obtaining the corpus, is not peculiar or *loco*centric. In some areas, the quasi-naturalization of the multidimensionality of phenomena that required professionals from different fields of knowledge to work together is already a reason to say that a piece of research is interdisciplinary, as in the case of Menossi, Lima and Corrêa (2008). In the case of the Health sciences, interdisciplinarity in its practical dimension has to do with the formation of teams from different areas of knowledge, usually in Health, i.e., in the same large area, to provide care.

The persistence of the idea that interdisciplinary research means directly seeking to solve problems, combined with the internal defenses of fields that are seen when there is greater aggregation in the large area than in distinct areas, ends up contributing to the construction of a conceptual, epistemological, and theoretical-methodological reductionism of interdisciplinary research itself. On the other hand, this operation indirectly ends up creating some confusion between interdisciplinarity as a theoretical approach or an epistemological and practical choice. Finally, in the efforts to defend or in the traditions that are being built up considering the intergenerational processes of encounters between supervisors and students at different moments in the construction of knowledge, the urgency of making approaches more flexible, of moving on from *dialogue* between peers to *action* between peers based on the dialectic of abandonment-adoption of concepts, still remains a challenge.

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