

Environment as a cosmopolitan value: a comparative socio-historical analysis of the school biology curriculum*¹

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Abstract

This work presents an analysis proposal based on theorizations regarding comparative systems of reason, cosmopolitanism and the history of school disciplines, seeking to understand how certain objects become subject to reflection and action in the school curriculum from an international perspective. Comparing historical aspects of the teaching of biology in Brazil and Germany, the article presents a discussion of how the environment has increasingly been constituted as a cosmopolitan value in the biology school curriculum. In theoretical and methodological terms, curricular documents and textbooks are treated as historical sources and an analysis of them is articulated with results of a literature review, evidencing how different cultural organizations are combined to make this object intelligible in the present. The analyses indicate a transnational process of hegemonizing the value of the environment as a pragmatic macro-trend related to the concept of education for sustainable development. This trend is overlapped by curricular traditions of teaching in diverse forms, and also by local issues in each country linked to the history of this school subject. In Germany, the hybridizations refer above all to the pragmatic macro-trend, punctuated by critical elements. Meanwhile, in Brazil, the transnational macro-trends are hybridized with local characteristics, mainly through academic development in the field of environmental education and its different currents, in addition to growing closer to social and environmental movements. The work demonstrates that this proposal for analysis broadens the potentials of articulation between curricular subjects and comparative education, principally in the sense of questioning international consensuses that are considered universal and transcendental concerning education.

Keywords

Curriculum – Comparative education – Environment.

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Introduction

In this work, we present the development of an analysis proposal that broadens the potential for articulation between curricular subjects and comparative education. We argue that investigating international consensuses regarding values considered cosmopolitan, universal and transcendental in the school curriculum, as is the case of the environment in the teaching of biology in schools, is a powerful contribution to understanding the processes of constructing this knowledge.

From the articulation between the theorizations regarding comparative systems of reason and cosmopolitanism of Thomas Popkewitz (2000, 2008, 2012a, 2012b, 2014, 2017) and curriculum studies on the history of school subjects of Ivor Goodson (1983, 1990, 1995, 1997), a comparison between different countries, in this respect, reveals the historical aspects in different contexts that generate principles perceived as transnational in schooling. When seeking to understand global and local relationships, as well as hybridizations⁴ between transnational trends and specific regional issues in a context that considers the relationships between knowledge, power and educational practices, the strategy of a comparative study proposed here aims to understand how historical standards and principles make certain objects subject to reflection and action in the school curriculum from an international perspective.

Therefore, conceiving schooling as a historical project that generates multiple trajectories and is not restricted to the national borders, we consider that these hybridizations are produced based on transcultural dialogues, as multidirectional processes in which differences are viewed as potentials rather than continuums of hierarchical values (POPKEWITZ, 2017, p. 16).

In dialogue with the curriculum theories of Ivor Goodson, we begin from the concept that the curriculum is a socially and historically evolved social construction, constituting a terrain of contestation, fragmentation and change (GOODSON, 1997, p. 27). Thus, it is the result of what is formally legislated, like all processes of interpretation, subversion and transformation that define what counts as valid and legitimate knowledge and that are in permanent dialogue with international and local issues, generating hybridization processes.

The work is organized in such a way that, first, we set out a broader perspective of comparative education adopted in the context of the field. We then discuss the core aspects of the theoretical articulation developed for the construction of the analysis proposal presented here. Finally, to exemplify the possibilities and potential of the proposal, we include a brief summary of a work developed from this perspective (MATTOS, 2019), specifically on the theme of the environment in the school biology curriculum in Brazil and Germany.

4- To Popkewitz (2000, p. 04), the concept of globalization/regionalization should be used as a single concept that presents a multiple-dimension overlap, viewed by the author through the hybridization or amalgamation of educational practices. Through multiple and multi-directional patterns, different layers of discourses that unite the global and the local overlap, generating hybridizations, defined from the "interrelation of processes of globalization and regionalization as constituted through fluid, multiple and historically contingent patterns" (POPKEWITZ, 2000, p. 06).

The perspective of cosmopolitanism in comparative education

Since its emergence in the early nineteenth century, the field of comparative education has constituted a conflict between two currents of academic traditions, political cultures and distinct scientific projects. One is linked to the need to inform political decisions, with a pragmatic purpose, and the other is of an academic nature, seeking to establish the science of comparative education (SCHRIEWER, 1992, p. 31-32). The tension between these two sensitive issues and the resulting conflicts of interest and ambiguities have impinged upon and marked the history of comparative education.

It appears to be a consensus among authors who study the field that it is currently undergoing a period of diversification, while at the same time questions are being raised regarding its identity (COWEN; KAZAMIAS; ULTERHALTER, 2012; NÓVOA, 2009; NÓVOA; YARIV-MASHAL, 2003). Since the late twentieth century, the classic comparative methodology has faced a number of challenges. Analysis units that have long gone unquestioned (nations, societies, cultures) have been losing their empirical and logical definition and been put in check by the complex intertwining of sociocultural units and global interdependencies (SCHRIEWER, 2009).

The ways in which the main comparativist authors have addressed these issues have proved to be quite varied. Nóvoa (2009) refers to several groups of discursive communities in the field that differ, mainly because they assume perspectives that are closer to functionalist theories (based on the idea of social balance) or critical theories (based on the idea of social change) and adopt approaches with trends that are sometimes more descriptive (based on observable facts and phenomena considered as natural realities) and sometimes conceptual, considering facts as realities constructed by discourses that place them in a given space-time (NÓVOA, 2009, p. 38).

In this work, we dialogue with a socio-historical perspective of comparative education from a critical outlook with conceptual approaches, based mainly on Thomas Popkewitz (2000, 2012a, 2012b, 2017). The core idea is that comparisons are made through an analysis, in the historical sense, of the facts, based on questioning the epistemological principles of modern times. Popkewitz (2000) developed a comparative strategy to understand global and national/local relations and the hybrid systems of reason through the relationship between knowledge, power and educational practices, understanding that school plays a fundamental role in constructing the concept of the cosmopolitan subject. To the author, systems of reason, or knowledge, are the principles that have historically defined what is thought and known and on which we act in different times/spaces. Therefore, these are the systems through which the objects of education are produced and managed (POPKEWITZ, 2012a, 2012b).

To this author, the comparative qualities of the rational system of education are addressed through the notion of cosmopolitanism that, in this context, expresses a cultural thesis regarding the subject understood as an agent, whose reason and scientific rationality could interfere in the development of daily life and society in the name of human progress. This thesis currently refers to what is said about cosmopolitanism in the

context of the permanent learner and the learning society. Modern education constantly links the individual to reports of social or economic progress and the revitalization of democracy that will promote personal improvement. The nation is interpreted in several ways and permanent learning acts as a particular project for the construction of a transnational government. Problem solving, an inherent characteristic of life, is a dominant discourse that crosses national borders to reformulate the educational space in an imagined community, in which knowledge is a key for industrial competitiveness and employment.

In this perspective, the image of the transnational community is one of a regulation of cosmopolitan homogeneity, future-oriented, and no longer like what used to be the case, with legitimate national identity rooted in histories, cultures and former territories. Its universal principles are abstract knowledge, human rights, democracy and equality, ignoring conflicts and divisions, through which consensus and peace are celebrated and remodeled. Cosmopolitanism serves as an intellectual tool for thinking in historical and comparative terms of schools as places that connect individuality with a collective sense of belonging. It highlights cultural theses to consider principles generated with regard to ways of life in politics, reform and pedagogical research.

The universalism of cultural theses concerning the cosmopolitanism of the child provides an apparently transcendent set of values that define what is provincial and what is past. Popkewitz (2012a) pointed out that this transcendence is expressed, for instance, in policies and contemporary research in Europe and North America concerning education for all children, as if the whole word represented a clear unit that transcends human differences. However, the meaning of all for humanity is not universal, but historical and particular, and involves exclusions and processes of debasement that situate some qualities of people, placing them outside the spaces of reason and inclusion. Thus, the focus on cultural theses regarding cosmopolitanism in education is a comparative historical tool for diagnosing the system of reason behind the generation of principles that differentiate and divide (POPKEWITZ, 2008).

In this respect, a comparison allows us to reveal the historical differences in time and space between the principles generated regarding who we are, who we should be and who we are not. This comparative study strategy is known as social epistemology. Its purpose is to study systems of reason to locate different manners of thinking and acting through understanding the political in education (POPKEWITZ, 2012b). Studying the system of reason in education, or its social epistemology, means considering knowledge as something historically situated, relationally and socially embedded in the political. Social epistemology considers different historical principles and patterns in different times and spaces that enable reflection and action with regard to certain objects. In other words, it is an approach that allows us to investigate what we know, considering that how we describe the world is not natural, but is affected by social interests. In this context, there is a dual focus in cosmopolitanism. On the one hand, it evidences the important historical characteristics that shape the epistemological principles through which the principles of pedagogy in modern education are ordered, distinguished and differentiated. On the other hand, cosmopolitanism serves as an intellectual tool for thinking of a comparative

method regarding the heterogeneity of the systems of reason in modern education and its sciences. The conditions, rules and patterns of reason have varied historically, leading to different comparisons. The role of social epistemology, in this case, is to study systems of reason to identify different ways of thinking and acting.

In this respect, historicization is viewed not as a search for the origins or evolution of something, but rather as an understanding of how objects in the present became plausible and feasible through different historical practices (POPKEWITZ, 2012c, p. 15). Such practices are disconnected from their origins and are reconnected forming more complex plots than the sum of their parts. These generate possibilities in the present, with openings for changes and resistance. Thus, when addressing the history of school curricula, Popkewitz does so by approaching the history of the present, proposing to make visible the rules and patterns of reason based on epistemological principles. The purpose here is to question how it is possible to think in the present and how things are conceived as a historical issue (POPKEWITZ, 2017, p. 16). The task of the history of the present is, therefore, to consider the system of reason that orders and classifies what is seen, discussed and done in school education.

By understanding the networks of practices through which the objects of school teaching become more intelligible, the principles that order and classify the school curriculum are gathered, connected and disconnected through complex historical processes (POPKEWITZ, 2011, p. 2). Therefore, it is through the curriculum that the rules and patterns of reason and the reasonable person incorporate principles that govern what must be known and how this learning should occur. Therefore, it is necessary for the history and study of the curriculum to center on the discontinuities, uprooting the traditional foundations of school subjects, precisely in what is considered natural or common sense.

Thus, a history of comparative and transnational education enables an important form of thinking of contemporary school as a historical project that generates multiple trajectories (POPKEWITZ, 2017, p. 16). The theoretical question is how the differences are produced, based on a conception of transcultural dialogues from the perspective of the history of the present time and the system of reason of cosmopolitanism.

Comparative education and curricular traditions

The view of school curricula as deriving from the best work of specialists acting as initiators of academic traditions is generally accepted by both educators and laypeople. This view is supported by government spokespeople, educational agencies, disciplinary associations and the media. Therefore, there is a consensus that school disciplines derive from intellectual disciplines or forms of knowledge (later broadened to fields of knowledge) created and systematically defined by a community of scholars (GOODSON, 1990, p. 233-234). However, a closer analysis of the historical processes regarding which school disciplines emerge, are defined and established reveals a series of disparities between explanations that seek to legitimize the academic tradition of school subjects and their historical evolution processes. That fact that subjects usually evolve to the establishment of an academic base does not explain which forces push subjects down this road to

culminate in this pattern (GOODSON, 1990). We cannot assume that all school subjects that make up an academic base do so with a direct relationship with a previously established academic field of knowledge. There are school subjects that precede, are divorced from or simply do not have an academic base discipline, forming autonomous communities. Furthermore, the school context encompasses diverse aspects that differentiate it from the university context, such as problems of motivation and control of students.

To Goodson (1990), in accordance with Layton (1972), the origin of a school subject is often related to the interests of students and the applicability of this knowledge to their needs. At this initial stage, subjects do not require teachers with special training in what they teach and are based on the missionary enthusiasm of these pioneers. Nevertheless, as the subject advances, to be deserving of funding and career opportunities, it needs to employ discourses that allow it to be considered as an academic subject, drawing closer to university disciplines. Layton defined three stages in this evolution, related to utilitarian and pedagogical purposes, which are generally predominant in the process of the emergence of a school subject, and academic purposes, related to drawing closer to the sciences of reference in universities, which tends to occur throughout their consolidation process. The occurrence of dialogues and temporal oscillations in a non-linear way between these utilitarian, pedagogical and academic teaching traditions addressed in the Layton model has been pointed out by several authors in the teaching of science and biology in Brazil (GOMES; SELLES; LOPES, 2013; FERREIRA; GOMES; LOPES, 2001; MARANDINO; SELLES; FERREIRA, 2009; SELLES; FERREIRA, 2005). For example, Gomes, Selles and Lopes (2013) pointed out that:

The historical linearity of this model limits it to interpretations that focus on the variety of social and institutional spaces in which school subjects take shape. Considering this limitation, the idea of temporal oscillation between utilitarian, pedagogical and academic traditions proposed by Lopes (2000) and Selles and Ferreira (2005) appears to be a more comprehensive way of explaining the historical transformations that subjects undergo. Lopes (2000), when analyzing the Science curriculum at the College of Application of the Federal University of Rio de Janeiro (UFRJ) between 1969 and 1998, pointed out a trajectory that mixes, in a non-linear way, the utilitarian, pedagogical and academic traditions. Likewise, Selles and Ferreira (2005) suggested that the teaching content of the school subject Biology related to the theme of human reproduction, despite being strongly linked to purposes of an academic nature, has also been selected for utilitarian and pedagogical purposes. (GOMES; SELLES; LOPES, 2013, p. 480).

Thus, from the dialogue with this theoretical perspective, the analysis proposal presented here seeks to investigate how pedagogical, utilitarian and academic objectives have aided the inclusion of objects in the school curriculum, articulating this investigation with the comparative perspective of Thomas Popkewitz, centered on the comparative system of reason and the notion of cosmopolitanism.

In an attempt to articulate these two authors, we based our work on writings such as those of Ferreira (2014), Ferreira and Jaehn (2010), Jaehn and Ferreira (2012) and Jaehn,

(2012), assuming that the drawing together and distancing of these two aspects do not put them at “contradictory or opposite poles, but on a horizon of possible articulations” (JAEHN; FERREIRA, 2012, p. 268). These dialogues mainly refer to notions of history, epistemology and the curriculum that have circulated and hybridized in Brazilian writings (FERREIRA; JAEHN, 2010). By taking a chance on a theoretical lens based on the two perspectives of History of the Curriculum, Goodson’s social history and the social epistemology of Popkewitz, Jaehn and Ferreira (2012) seek to intertwine different views of power based on these two authors. In their drive to narrow the gap between critical, postmodern and post-structuralist approaches, the authors have developed such a movement to aid investigations that simultaneously address the historical and contingent aspects of schooling. Ferreira (2014, p. 188) maintains, therefore, that the two authors, albeit from different theoretical perspectives:

[...] are interested in the internal and external contexts of schooling, assuming that the relationships between knowledge and power are core aspects, which produce curricula and subjects. Thus, despite focusing on the social structures that Goodson (1995, p. 84) calls the “curricular form”, or on the productive aspects of power that regulate subjectivities (POPKEWITZ, 1994, 1997, 2001), both perspectives are productive when it comes to problematizing hegemonically positioned curricula [...]. (FERREIRA, 2014, p. 188).

Thus, from this perspective, curricula are understood “as socio-historical constructions that produce and hegemonize meanings regarding what we are and what we know”. The knowledge conveyed in school subjects is configured as a form of social regulation, participating in power struggles and relations “surrounding the definitions of which knowledge and rationality should be considered socially valid” (FERREIRA, 2014, p. 187).

Therefore, agreeing with these authors, we assume in this work that looking at the curriculum based on the theorizations of Ivor Goodson allows us to articulate with the discussions of Thomas Popkewitz on social epistemology, cosmopolitanism and the comparative system of reason. Thus, like Ferreira (2014, p. 206), we understand that it is necessary to investigate the curriculum based on the understanding that the “socio-historical reasons for assuming certain discourses are valid and/or true” and that viewing the curriculum in this way is a powerful tool. By researching historical processes and discontinuities, an attempt is made to denaturalize certain objects in the school curriculum, revealing the epistemological principles that make them part of modern education and different conditions, rules and patterns that are part of these systems of reason.

Through this perspective, we include elements from a study conducted for a doctorate thesis (MATTOS, 2019) regarding how the topic of the environment can be understood as an object of education that forms part of the system of reason that constitutes contemporary cosmopolitanism in the biology school curriculum. We now present some core aspects of this study to illustrate the proposed analysis.

The environment as a cosmopolitan value

The work in question (MATTOS, 2019) presents a comparative study on the environment in the biology school curriculum in two countries, Brazil and Germany, arguing how this has come to constitute a cosmopolitan value. By articulating Thomas Popkewitz's theorizations concerning cosmopolitanism and Ivor Goodson's curricular studies on the history of school subjects, an attempt is made to explain how transnational macro-trends regarding the environment (critical, pragmatic and conservationist⁵) are related to curricular traditions (academic, pedagogical and utilitarian) in the teaching of biology in schools.

Thus, from a comparative analytical approach that focuses on the history of the present, curricular documents and textbooks are treated as historical sources and their analysis is articulated with results of the literature review in the drive to understand how transnational and regional historical practices overlap to make this goal intelligible. In other words, they make it possible, feasible and intelligible in the present time. Therefore, these sources are articulated analytically in a historical perspective that seeks to denaturalize what is presented regarding the theme of the environment in the context of the biology curriculum.

In this way, an attempt is made to construct a form of comparative analysis that reveals the historically produced differences on this topic in Brazil and Germany. The integration of the analysis of this set of sources makes it possible to recognize different ways of thinking and acting with regard to the environment. Therefore, there is evidence of hybrid systems of reason through the relationship between knowledge, power and educational practices. For this reason, the official curriculum documents considered more historically relevant are used in accordance with the literature of the field, along with the most widely used textbooks in each country in recent years. These materials are treated as historical sources and their analysis, articulated with results of the literature review, demonstrate how different cultural organizations overlap to make this object intelligible in the present time.

The study indicates that the growing inclusion of environmental themes in the curricular spaces of the school biology curriculum in recent years is widely recognized by authors in this field, and that the articulation between these educational and social issues and scientific interests has been an essential factor for this process (GOMES, 2008;

5- Layrargues and Lima (2014) defined three macro-trends that form the main poles of contemporary representations related to political, pedagogical and epistemological proposals regarding the environment in the context of teaching. The first is "conservationist", related to the idea of protecting nature and behaviorism, based on raising awareness through activities in nature and changes in individual behaviors. It is founded on principles of ecology, proposing that the establishment of an affective individual relationship with nature would result in a cultural change of revitalization of the anthropocentrism that predominated in the early decades after the emergence of discussions on environmental education. The second is "pragmatic", characterized by defending an environmentalism of market results, based on the neoliberal hegemony established worldwide beginning in the 1980s, overlapping market logic and social spheres associated with concepts such as the "green economy", "clean development mechanisms", "a smaller ecological footprint" and "conscious use of resources". This is founded on the current patterns of production and consumption and operate at the level of technological and behavioral changes. This in turn is based on the idea that these superficial changes will be sufficient to maintain the current system. The third is "critical", uniting the trends that began to develop in the 1990s as a reaction to the dominant conservationist view, founded on the idea that the environmental crisis is not about natural problems but rather social problems that are expressed in nature, arguing that environmental problems originate in social relations in the dominant models of society and development.

GOMES; SELLES; LOPES, 2013; MENDONÇA; TRAJBER, 2006; OLIVEIRA, 2009; SANTOS, 2010; VASCONCELOS; GOMES, 2011). Although the field of environmental education was originally configured as the main space for the development of discussions on the theme of the environment in education and has been so since the late 1980s, there has also been talk of education for sustainable development. Since 1992, Agenda 21 has become one of the main reference documents for the theme, and the concept of sustainable development has been consolidated at the international level. The way this is understood in different parts of the world, however, varies significantly (UNTERBRUNER, 2016, p. 171).

In Brazil, the concept of sustainable development has been the subject of controversy and widely criticized by the players in the field, mainly those who lean towards the critical macro-trend (LAYRARGUES, 2003; LAYRARGUES; LIMA, 2014; LOUREIRO, 2002). Meanwhile, in Germany, there is talk of consensus deriving from the different currents of environmental education that were consolidated during the 1980s under the term “sustainable development” (SCHLEICHER, 1995).

Historically, in Brazil, the diversity of currents and trends related to the teaching of the environment in schools has been observed since the 1990s and has grown through initiatives of self-reflection and self-analysis, especially in the field of environmental education (SAUVÉ, 2005; LAYRARGUES, 2004; SORRENTINO, 1995). The conservationist trend, predominant up to the 1980s in Brazil, is related to the origin of the environmentalist movement linked to the perspective of preservation, and also the internal political context of authoritarianism and restrictions on democracy during the period of military rule (LAYRARGUES; LIMA, 2014, p. 27). Political openness and, consequently, the expansion and deepening of critical issues in the country led to social movements becoming more closely involved in environmental debates.

In this way, the diverse currents that are still found in the field today came to coexist within the Brazilian environmental debate and, more specifically, in the teaching of biology. Curriculum and Brazilian educational policy documents reflect this scenario of heterogeneity, presenting concepts that oscillate between the critical macro-trend and a more conservative trend, sometimes prioritizing pragmatic and technical aspects of sustainability and, at other times, emphasizing the preservation of nature. The concept of sustainable development is at times assumed in a naturalized way based on aspects of pragmatic macro-trends, and at other times problematized from questions arising from a matrix related to the critical macro-trend.

In Germany, the concept of sustainable development has become hegemonized, associated more clearly with the perspective of the pragmatic macro-trend. The German educational reforms that began in the 1990s appear to have been the main factors responsible for easing this dispute (UNTERBRUNER, 2016). These reforms were based on perspectives of education founded in experimentation and focused on resolving problem situations, based on interdisciplinarity and concepts that prioritize cognitive, pragmatic and affective dimensions of the learning process. Thus, the perspective of sustainable development, which combined aspects such as a focus on the attitudes and interests of students and decision making and solving problems, went against the underlying concepts of the bases of the ongoing educational reform and, therefore, added to it (SCHLEICHER, 1995). With the development of initiatives of integration of central European countries,

at that time, the influence of international trends became increasingly expressive in these curriculum reforms.

In this context, large-scale international evaluations such as TIMMS (Trends In International Mathematics And Science Study) and PISA/OCDE (Organisation for Economic Co-operation and Development Programme for International Student Assessment) became core aspects for the teaching of biology in Germany (GROPENGIEBER; KATTMAN, 2006, p. 21). The discussions on education regarding the environment focused on the notion of competence adopted by the PISA/OCDE, leading to a series of adjustments in the conceptions of competence that had been discussed in Germany up to that time (BÖGEHOLZ et al., 2014, p. 235). Thus, the perspective of education regarding sustainable development, aligned with a pragmatic macro-trend, as defined by international documents (such as the United Nations Sustainable Development Goals⁶), became the main reference points in Germany for this debate. Through pragmatic issues such as strategies for investing in the efficiency of the current production system, behaviorist aspects related to conservation or even critical aspects with popular participation and political mobilization, the most highly valued curricular tradition of teaching in German materials can be characterized as utilitarian (MATTOS, 2019).

Taking textbook excerpts from these two countries as an example, it is possible to exemplify more accurately the production of this object as a cosmopolitan value. Most of the books that were analyzed (MATTOS, 2019), both German and Brazilian, make references to international documents, highlighting the transnational/universal nature of the theme of the environment. The environmental issue is placed as an indispensable component for today's society, in keeping with the concept of sustainable development associated with pragmatic macro-trends, which has been presented as a transnational model, as demonstrated below:

Environmental management includes environmental policy and conservation. It is the totality of all efforts and measures to protect the environment. Its goal is sustainable development to maintain natural resources for humanity. Since the Declaration of the United Nations Conference on Environment and Development in Rio de Janeiro (1992), environmental conservation has become an indispensable component of sustainable development. Environmental management is a global, regional and local task. (BAYRHUBER; HAUBER; KULL, 2010, p. 418, our translation).

In this development model, economic progress and environmental conservation are considered compatible and must be closely related [...] Its aims and goals will encourage action for the next 15 years in crucially important fields for humanity and the planet [...]. (LOPES; ROSSO, 2016, p. 132-133).

6- In August 2015, the Sustainable Development Goals (SDG) were adopted at the United Nations Sustainable Development Goals Summit to provide guidelines for national policies and international cooperation over the next fifteen years, succeeding and updating the Millennium Development Goals (MDG). Available at: <http://www.itamaraty.gov.br/pt-BR/politica-externa/desenvolvimento-sustentavel-e-meio-ambiente/134-objetivos-de-desenvolvimento-sustentavel-ods>. Accessed in September 2017.

Therefore, such examples reinforce that, in the contexts of Brazil and Germany, the way in which the environment has been constituted as a cosmopolitan value in the school biology curriculum appears to be related to a transnational process of hegemonizing the pragmatic macro-trend, supported by the concept of education for sustainable development. However, this trend overlaps with the teaching traditions of the biology school curriculum in several ways, as well as with local issues in each country related to the history of this school subject. In Germany, hybridizations refer mainly to the predominance of the transnational hegemonic conception related to the concept of sustainable development, based on pragmatic macro-trends, but with elements of the critical macro-trend. The rejection of behavioral aspects and the inclusion of issues related to socioeconomic inequalities are examples of these elements, which seem to be closely related to the German teaching tradition, as exemplified in the following excerpt from one of the books that were analyzed.

Thanks to the influence of the 1992 United Nations Conference on Environment and Development in Rio de Janeiro, ecological, as well as economic, aspects are analyzed when assessing a product. [...] In recent years, a third dimension has also come to be considered in these analyses: the dimension of sustainability and its social aspects. Thus, an investigation is conducted to determine whether, in the production and/or disposal of a product, exploitation occurred through cheap labor or child labor and if the use of the product can cause damage to health. (BRAUN; PAUL; WESTENDORF-BRÖRING, 2011, p. 365, our translation).

Meanwhile, in Brazil, there was an oscillation between the three macro-trends, with a significant presence of the critical macro-trend, as illustrated by the following example:

To reduce harm to the environment and, consequently, improve our quality of life, it is necessary to take measures to reduce the amount of garbage and treat waste adequately. It falls to society, for instance, to pressure the government to create and enforce measures that focus on protecting the environment and people's health. But there are other things that you yourself can do in your daily life:

- Avoid using plastic bags from shops and stores to carry your shopping. Whenever possible, use your own carrier bag. [...].
- Do not throw garbage in the street. [...].
- Join associations in your neighborhood and ecological movements to pressure the government to take action on all issues linked to environmental protection. (GEWANDSZNAJDER; LINHARES; PACCA, 2016, p. 277 and 287).

This situation seems to be the result of a hybridization process between transnational macro-trends and local characteristics, such as academic development and self-reflection process in the field of environmental education and its different currents, the closer links between environmental and social movements, and the historical context of political reopening in which these debates progressed.

Final considerations

The analysis proposal that was developed and the analysis that was presented identify the paths trodden regarding the ways in which the school curriculum has intertwined multiple local and global aspects in the process of globalization/regionalization. The articulation between transnational macro-trends and curricular traditions generates contingent and historical patterns that involve relationships between power and knowledge in a manner that is complex and not one-directional, representing an overlap of multiple dimensions (POPKEWITZ, 2000, p.4).

Viewing the environment in this way in the teaching of biology in schools, based on the cosmopolitanism of Popkewitz (2012a, 2014) and from the theorizations of Goodson (1983, 1990, 1995, 1997) on the history of school subjects, enables the problematization of this theme, understanding its construction as a universal value in the schooling of rational children, restricting the possible through the homogenization of certain trends.

The analysis based on theorizations regarding comparative systems of reason, cosmopolitanism and the history of school subjects, demonstrated how the environment has been constituted as a cosmopolitan value in the school biology curriculum through an investigation of how curricular traditions have informed the inclusion of this object in the school curriculum articulated to the critical, pragmatic and conservationist macro-trends related to the theme. Taking textbooks and official curricular documents as historical sources provides evidence of how different cultural organizations cross each other's paths to lend intelligibility to this object in the present time.

Therefore, this analysis permits a view of how similarities occur between the theme of the environment in biology curricula in Brazil and Germany, but it also clarifies how interpretations are made in the curricular constructions of these two countries. Thus, it can be seen that this theme is validated at the international level through an exploration of pragmatic trends, associated with the idea of education for sustainable development, which are constituted amidst curricular traditions of this school subject. On the other hand, it is important to highlight that in Germany this pragmatic and utilitarian consensus does not exclude characteristics of critical trends. Meanwhile, in Brazil, the analysis indicates an oscillation between conservative, pragmatic and critical trends, but with a stronger presence of the latter, included in curricular constructions marked by academic, pedagogical and utilitarian traditions.

To conclude, the analysis reinforced that argument that views the theme of the environment in the biology curriculum as a cosmopolitan value, produced socially and historically through the intersection of discussions on the curriculum related to valuing trends in environmental education and curricular traditions of the school subject of biology. By enhancing this view through a comparative study and analyzing different organizations and cultural connections that have built this system of reason, its heterogeneities stand out, in addition to what is being included and excluded in this construction. This analysis proposal expands the potential for articulation between curricular studies and comparative education, mainly in the sense of questioning the international cosmopolitan consensus considered universal and transcendental with regard to teaching.

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