

**PHYSICAL-NATURAL THEMES AND THE HISTORICAL-CRITICAL
PEDAGOGY: ELABORATION OF A DIDACTIC MATERIAL FROM A
DIALOGUE WITH GEOGRAPHY TEACHERS**

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ABSTRACT:

The soil is frequently portrayed as a product of the interaction between other natural phenomena, as an available resource or merely as the ground on which the society is structured. In opposition to this utilitarian view, the totalizing and humanizing concept of Living Soil regards the soil as a living and complex organism governed by dynamic balances. From the perspective of the Living Soil and the Historical-Critical Pedagogy and through the use of Ana Primavesi's stories, the objective of the present study was to elaborate and analyze a didactic material about the study of soils in geography. The research was developed following a qualitative approach grounded in the dialectical analysis of the data and was carried out with the participation of geography teachers from basic education aiming at establishing relations between the school routine, the research and the produced material. The results indicate that the didactic material and the stories selected can contribute for the development of physical-natural themes in geography, especially the concept of Living Soil, in association with human actions. The Historical-Critical Pedagogy allowed us to systematize the central problematization of Soil Education: the relation between Society and Nature.

**AS TEMÁTICAS FÍSICO NATURAIS NO ENSINO DE GEOGRAFIA E A
PEDAGOGIA HISTÓRICO CRÍTICA: ELABORAÇÃO DE UM MATERIAL
DIDÁTICO EM DIÁLOGO COM PROFESSORES**

RESUMO:

O solo é, frequentemente, retratado como o produto da interação entre os outros fenômenos naturais, como um recurso disponível para o homem ou meramente o meio material sobre o qual a sociedade se estrutura. Em oposição a essa visão utilitária, parte-se da concepção totalizante e humanizadora do Solo Vivo, que considera o solo como um organismo vivo e complexo regido por equilíbrios dinâmicos. Objetiva-se elaborar e analisar um material didático sobre a educação em solos em Geografia a partir da perspectiva histórico-crítica, tendo como base os contos de Ana Primavesi. A pesquisa desenvolvida tem como base a abordagem qualitativa ancorada em uma análise dialética dos dados e a Pedagogia Histórico-Crítica. A pesquisa foi realizada com a participação de professores de Geografia do ensino básico visando estabelecer relações entre o cotidiano escolar, o trabalho de pesquisa e o instrumento elaborado. Os resultados obtidos indicam que o material e os contos que o integram podem contribuir para o desenvolvimento das temáticas físico-naturais em Geografia, especialmente a partir do conceito de Solo Vivo, articulado com as ações humanas. A abordagem da Pedagogia Histórico-Crítica possibilitou a sistematização da problematização da educação em solos: a relação entre Sociedade e Natureza.

INTRODUCTION

Physical-natural themes play a fundamental role in the construction of geography contents, since this discipline is aimed at understanding relations and totality. However, such themes are often disassociated from social factors, which reinforces the fragmentation of geography and disregards the relations between society and nature, critical for the analysis of the geographic space and the formation of critical citizens (MORAIS, 2013). Nevertheless, physical-natural themes must be taught based on social reality, allowing the formation of critical individuals who act as social transformation agents. The social practice experienced in daily life supports the abstraction process, which is critical for the construction of scientific concepts incorporated to a new social practice that will transform the social reality.

In this sense, in what regards teaching physical-natural elements in geography, it is fundamental to bear in mind that "the society needs to understand that the existing environmental problems, both in urban and in rural areas, involve relations established between physical-natural and social factors " (MORAIS, 2013, p.14). Therefore, these themes have to be addressed in geography teaching from the conception of geographic space, which transcends the notion of location, where the materiality and the social relations are intertwined, a hybrid product of history that regulate the reality (COUTO, 2005, p.84).

From this perspective of totality, it is possible to understand how these aspects are articulated through a more integrated analysis of the geographic space, considering not only the physical-natural characteristics of the studied areas, but also the "the historical-social contextualization, the occupation and the characteristics of the population, associating them with broader historical-social contexts" (MORAIS, 2013, p.14).

It is important to emphasize that "the perception associated with the various elements comprised by the environment are differentiated: some of these elements are well known and understood, while others are unknown or even underestimated" (MUGGLER, *et al*, 2006, p.734), and the soil is one of the physical-natural elements that are among the latter. In general, the soil is portrayed as a product of the interaction between other natural phenomena, as an available resource or merely as the ground on which the society is structured:

In what regards the soil, people often lack awareness and sensitivity, which results in degradation, either by misuse of by disorganized occupation. In most cases, issues concerning soil conservation have been neglected. The consequence of such neglect is the increase of environmental problems associated with soil degradation: erosion, pollution, landslides, siltation of water bodies, etc. (MUGGLER, *et al*, 2006, p. 735)

Thus, considering the need to center the teaching-learning process in the formation of social individuals capable of transforming reality, it is critical to problematize the conception of soil as the result of the interaction of other natural phenomena and the its use and appropriation by the society. We need to think about the notion of Living Soil, which understands the soil as a complex living organism governed by dynamic balances (PRIMAVESI, 2020).

Based on the problematic involving physical-natural themes, the present research aimed at elaborating and analyzing a didactic material from the perspective of the Historical-Critical Pedagogy. The idea of carrying out this study emerged from the lack of materials based on this pedagogical conception and, through the elaboration of the material, we tried to provide means to allow the understanding of the relation between society and nature from a critical point of view, unveiling information regarding the production of space. The research is based on the didactic proposal established by Gasparin (2020), which is grounded in the historical-dialectical materialism and in the Historical-Critical Pedagogy.

The Historical-Critical Pedagogy opposes the hegemonic teaching process of the capitalist school that disregards the political dimension of education, ignoring inequalities, naturalizes violence and deprives phenomena of their historical dimension. This perspective considers the school an expression, an answer to the society in which it is inserted, it is an ideological and politically committed perspective with specific purposes. Concentrating the analysis on the school contents, the Historical-Critical Pedagogy brings new learning indicators which include the demonstration of the theoretical knowledge of the contents and its use by learners towards social needs (GASPARIN, 2020). According to this theory, knowledge is constructed upon a material basis "and results in the human work on the historical process of the transformation of the world and of the reality through this process " (GASPARIN, 2020, p.04). In this sense, Gasparin (2020) argues that the starting point of the new method is the broader social reality, which critical view allows a new pedagogical way of thinking and acting. The author emphasizes that, from this perspective,

It is necessary to walk the path from social reality, as a whole, to the theoretical specificity of the classroom and from this back to the social totality once again, allowing a valuable dialectic process in the pedagogical practice (GASPARIN, 2020, p.03)

The social practice, the first step of the method proposed by Gasparin (2020), consists in preparing and mobilizing the students for the construction of knowledge, a fundamental factor related with the critical theory in geography, and the social-spatial practice is the ground for the analysis of the production of the space in geography classes. The elaboration of a geography didactic material under the historical-critical perspective must consider the importance of daily life and the syncretic thinking in the construction of scientific knowledge, since from the observation of daily life elements children can relate experience and scientific, philosophic and artistic activities, thus developing higher mental functions (memory, attention, perception and thinking) and scientific concepts (VYGOTSKI, 2009).

Therefore, the present research is grounded in the Historical-Cultural Psychology in what regards the development of teaching practices aimed at the construction of geographic reasoning and broadening spatial thinking (JULIASZ, 2017), opening new paths for geography teaching. Research in geography demands teaching methodologies that are coherent to the critical conception of the relation between society and the physical-natural environment, i.e., approaches and didactic materials that allow an integrative construction of concepts, considering nature and society as inseparable elements.

It is important to note that the didactic material is not neutral. Instead, it is an instrument in the teaching-learning process, as a language and as a material element, embedded with a culturally constructed symbology and aimed at supporting the achievement of the final objective: the conscious learning in the construction of knowledge.

In this sense, the elaboration of a didactic material under the historical-critical perspective supports the creation of a favorable environment to significant learning and to the formation of social individuals, capable of building knowledge in a critical and autonomous way, acting as social transformation agents. Thus, we emphasize the importance of elaborating a didactic material to teach physical-natural themes from the theoretical-methodological perspective, addressing environmental issues (traditionally taught in science classes) in association with social practices. Doing this, we emphasize the social function of geography and the need to address environmental issues from the geographic space in basic education, mobilizing a particular geographic way of thinking, the geographic reasoning, considering the geographic relations, principles and scales and bringing contributions to the geographic science and to the society as well.

Considering that geographic reasoning requires questions that bring relations and ways to make the study real rather than promoting memorization, the research question to be answered through the elaboration of the didactic material was: What interfaces regarding teaching physical-natural themes and the Historical-Critical Pedagogy can be established through Primavesi's stories (2016)?

The use of stories in the didactic material is justified by the fact that literature enriches the debates about geographic concepts by using the reality as inspiration and sensitively addressing elements of the reality and contributing to the cultural and critical formation of the students. Considering the experience as a unity comprising environment, subject and daily life, literature supports school education and brings different views that exceed daily life experience. Thus, literature allows us to establish relations between what has been read with the context, promoting the interaction between the word and the world (VYGOTSKI, 2009). Therefore, literature can support the teacher in the mediation between daily life and scientific knowledge, creating conditions for the students to think and reflect upon the concepts.

MATERIAL AND METHOD

The present study is a qualitative research based on a dialectic analysis of data and is mainly focused on the investigatory process. According to Marconi and Lakatos (2003), the dialectic method understands the world as a set of processes in transformation, change and development, where things do not exist isolatedly, but as a coherent whole. For the dialectic method, the internal and innovating contradictions that represent the unity of the contraries are the engine of change.

The historical-critical pedagogy theory has the same philosophical grounds of the methodology followed in the present research, i.e., the dialectic method. This teaching methodology contributes to develop a critical geography, which criticizes the idealism and considers the contradictions of historical material relations.

We agree with Gasparin about the need of new pedagogic strategies to address the contents so that they are analyzed, understood and assimilated in a dynamic totality (GASPARIN, 2020). The didactic method proposed by Gasparin is structured in four

descendent levels: the theory of knowledge on the historical-dialectic materialism based on praxis; Vygotski's historical-cultural theory, centered in the relation between the present developmental level and the proximal development zone (such relation will determine a new level of development); the five constituent elements of the Historical-Critical Pedagogy established by Saviani (2011) (social practice, problematization, instrumentalization, catharsis and social practice) and the experience in the classroom. (GASPARIN, 2020). For the author, the new pedagogical process is expressed by the new methodology corresponding to the dialectic theory of knowledge.

Therefore, in the historical-critical pedagogy, theory and method are correlated, building the basis for the discovery and transmission-assimilation of new knowledge, from the synchysis to the synthesis through the mediation of analysis (SAVIANI, 2011). The didactic material developed in the research is aimed at the 6th year – the transition between primary and lower secondary education. It was elaborated from a thorough bibliographic review followed by a discussion about the themes with four teachers, two of them teaching in public schools and the other two in private schools. The teachers participated in three moments: first, they answered to an open questionnaire organized in four topics: 1) *What was your formation in physical-natural themes regarding teaching about soils like? How the physical-natural themes are elaborated and applied in your teaching practice?* 2) *In what school year the theme soils is developed? What contents do you teach to your students? Is the theme soil inserted in other contents (urbanization, agriculture, etc.)?* 3) *Do you use textbooks or any other didactic material (provided to you or elaborated by yourself) to teach about the soil? If so, what material do you use? How would you evaluate these materials? Thinking about your teaching practice, what would be fundamental in the elaboration of a didactic material about soils?* 4) *Have you heard of Ana Primavesi's stories? If so, how was your experience and what is your perception of the relation between her work and geography teaching?*

After the questionnaire had been answered, a focus group discussion was carried out in three synchronous meetings: two with teachers 2, 3 and 4, and one with teacher 1, according to the teachers' available time. Each meeting lasted between one and two hours and had the following agenda: introduction, discussion about the questionnaire, presentation of the research and definition of the evaluation indicators. The meetings were recorded under the authorization of all the teachers to facilitate the systematization of the collected data. Subsequently, the teachers evaluated the didactic material elaborated using the indicators described in Chart 1. Based on their evaluation, the material was reformulated and sent to the participant teachers.

Chart 1. Systematization of the analysis

EVALUATION INDICATORS	YES	NO	PARTIALLY	COMMENT
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THE MATERIAL AND ITS DESIGN				
Is it presented in a clear and objective language?				
Is the graphic design appropriate?				
Are the topics coherently presented?				
Is it appropriately systematized?				
Is there clear relation between stories and contents?				
Does it allow the students to understand the relation between the concepts?				
Is it appropriate to be used in the classroom?				
Is it appropriate for the target learners?				
The stories selected are appropriate to address education about soils in geography?				
Are the resources and the language appropriate for geography teaching?				
CONTENT AND CONCEPTS				
EVALUATION INDICATORS	YES	NO	PARTIALLY	COMMENT
Are the contents according to the geography official curriculum?				
Are they presented according to the historical-critical pedagogy?				
Do they contribute for the formation of a social being?				
Are the concepts contextualized with society?				
Can the content be included in the lessons?				
HISTORICAL-CRITICAL PEDAGOGY				
EVALUATION INDICATORS	YES	NO	PARTIALLY	COMMENT
Is the material based on teachers' and students' needs?				
Does it present coherent problematizations regarding social practice?				
Does it contribute for the construction of scientific knowledge?				
Does it contribute for the incorporation of cultural instruments to support social practice transformation?				
COMPLEMENTARY COMMENTS				

Source: organized by the authors

For the first elaboration of the material, we considered the discussion about the importance of school education in broadening the way to understand and analyze the reality, and Ana Primavesi's stories were used to contextualize the physical-natural

themes. The intention was to evidenciate the dialectic relation between the soil and the production of space according to the historical-critical theory.

The stories by Primavesi mobilize us to think about a nature that humanizes itself, in a movement that follows the search for totality and for the development of learning and of the human being as well.

“Nature humanizes itself”, from an inorganic specific place it starts to constitute the amplification of the inorganic dimension of human beings in relation with the nature and with themselves, in its natural and cultural existence, in a perspective of totality. In practice, we do not discuss siltation itself, there are multiple possibilities in the teaching process, interactions and interconnections that produce a consequent behavior concerning voluntary attention, mediate perception, memory and thinking about the phenomenon which is being studied. The articulation between the content and, broad gnoseological processes involving the phenomenon and social reality is concretized by the intentional action of the teacher along with concrete learning conditions, i.e., the motive and the need to assimilate the ontological dimensions of knowledge (SOUZA; JULIASZ, 2020, p. 33)

The material was elaborated in a way to comprise instruments, questions and spatial representations that would contribute for the geographic analysis. For this, we drew upon the indagation proposed by Morais (2013) to ensure a that the learning process would be meaningful and aligned with social aspects regarding the physical-natural themes in geography: “How should the physical-natural themes be addressed in basic education to contribute to the critical and participative formation of the students?” (MORAIS, 2013, p.15)

The elaborated material comprises theoretical-methodological guidelines to the teachers regarding the physical-natural themes, specifically addressing the notion of ‘living soil’ presented by Ana Primavesi’s stories in the book "A Convenção dos Ventos" (The Convention of the Winds) (2016) and a set of activities – including the problematization regarding soils – to be used with the 6th grade. The stories were selected considering the indagation suggested by Morais (2013) to guide geographic reasoning development, which represents the capacity of establishing spatial-temporal relations between phenomena and processes in different geographic scales (GIROTTO; SANTOS, 2017, p.99). The selected stories were: *Tatá, Pepe e Gigi: as três gotinhas de chuva* (*Tatá, Pepe and Gigi: the three little raindrops*); *O tietê* (*The tietê*); *A terra e o arado* (*The earth and the plough*) and *O Zéquinha do Jegue* (*Zequinha and the donkey*).

Considering that children’s knowledge about the space is developed through action and language, where “the action, an activity produced by children themselves, represents a source of knowledge, along with language” (JULIASZ; CESTARI, 2018, p. 32), the didactic material must comprise spatial, cartographic and image representations. The methodological choice of using different languages and cultural instruments in the didactic material is based on the idea that geography allow the articulation of those languages and establishes spatial relations through them, contributing for the mobilization of the student in the learning process and for the development of spatial thinking. Thus, cartography, literature, charges, newspaper articles and documentaries allow the students to learn how to build their identities face to the modernism conventions, scaping from the technical and homogeneous rationality (SANTOS, 2013).

For the material's design, we used the program Canvas Pro¹ on a computer connected to the internet, the book entitled Convention of the Winds, the literature mentioned herein, sites, apps and videos inserted in the didactic proposal.

All the data produced through bibliographic review, the dialogue with the teachers and the problematic produced in the present qualitative, interpretative and explanatory research were analyzed and guided the elaboration of the didactic material. Thus, the material was elaborated based on the materialist dialectic and on the Unity of geography, aiming at overcoming dualisms, such as physical geography/human geography, time/space and local/global. In this sense, the following elements guided our analyses:

- a) Identification of more developed ways through which historically- produced objective knowledge is expressed, recognizing the conditions of its production and understanding its main manifestations, as well as current transformation trends.
- b) Conversion of the objective knowledge into school knowledge, making it accessible to students in the school space and time.
- c) Provide the students with the necessary conditions not only to assimilate objective knowledge as a result, but also to learn its production process and the current transformation trends (SAVIANI, 2011, p. 08-09).

The Historical-Critical psychology, through the formulation of higher mental functions (memory, perception, attention and thinking) (MARTINS and RABATINI, 2011) and the construction of concepts in a system, aligned with the historical-critical didactics, provided means for the elaboration of the material, which is the product of the analysis of the teaching interface between physical-natural themes and the Historical-Critical Pedagogy based on Ana Primavesi's stories, since, according to the materialist dialectics, each contains a dimension of the other.

The potentialities of the stories selected were analyzed with the objective of developing the physical-natural themes in a contextualized way, broadening the way to understand and analyze the reality. A chart and a conceptual map were used as instruments to think how the Historical-Critical Pedagogy could provide the basis for the teaching process and to analyze its relations with Ana Primavesi's stories and the concept of Living Soil. Such instruments evidentiate the dialectic relation between the soil and the production of geographic space. Chart 1 is organized in columns, the first four ones regard the analysis of the story, considering the spaces, the descriptions, the characters and their experiences in the space. The three following columns present the geography contents based on the historical-critical pedagogy elements: problematization, instrumentalization and catharsis. Each column contributes to analyze the potentiality of the story.

¹ The use of multimedia resources to elaborate the material complied with the regulations regarding the software: "All Pro Stock Media on the Service is protected by United States and international copyright laws and treaties. Canva and/or its various Contributors own all rights, interests and title, including the copyrights, in and to the Pro Stock Media. Canva and/or its Contributors reserve all rights in and to the Pro Stock Media not expressly granted to you by the terms of this One Design Use License Agreement. Your rights to use any Pro Stock Media are subject to this One Design Use License Agreement and are conditioned upon (i) your payment to Canva for your use of the Stock Media in a single Canva design; or (ii) your holding of an eligible Canva subscription, namely Canva Pro, Canva for Enterprise, Canva for Education, Canva for Nonprofits or any other paid subscription Canva may offer from time-to-time" Source: <https://www.canva.com/pt_pt/politicas/onedesign-2/> .

Chart 2. Analysis systematization

Space	Description of the space	Characters	Experience	Problematizations	Physical-natural themes relevant to geography teaching	Geography concepts and contents
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Source: organized by the authors

It is important to note that the analysis of the potentialities of the stories, the systematization charts and the conceptual maps are of the utmost importance in the research, since rather than just providing results, they are components of the didactic material, which comprises theoretical and methodological guidelines for the educators.

RESULTS AND DISCUSSION

1. *The dialogue with Basic Education teachers*

The dialogue with the teachers was fundamental for the development of the research and for the elaboration of the didactic material. We understand that the participation of the educators is fundamental to elaborate a theoretical-methodological material aligned with the teaching practice and coherent with basic education. The answers given by the respondents were organized so as to allow the visualization of all the reflections.

In the answers to the questions *What was your formation in physical-natural themes regarding teaching about soils like? How the physical-natural themes are elaborated and applied in your teaching practice?* teachers 1,2 and 4 pointed out the limitations regarding the elaboration of the theme, which did not emphasize the study of soils. As for teaching practice, the teachers highlighted the importance of field work (teachers 1 and 3), the importance of relating the physical and human aspects of the theme (teacher 4), and the importance of addressing the environmental impacts in this theme (teacher 2).

For the questions *In which school year the theme soils is developed? What contents do you work? Is the study of soils inserted in other contents (urbanization, agriculture, etc.)?* all the teachers answered that the 6th year would be the moment when greater focus is given to the theme, which is also addressed in the 7th year in morphoclimatic domains (teacher 1) and in urbanization and landslides (teacher 3). In the 8th and 9th years, the theme 'soils' is developed by teacher 3 to address continents, types of soil and their influence in the occupation of space.

The third question was: *Do you use textbooks or any other didactic material (provided to you or elaborated by yourself) to teach about soils? If so, what kind of material do you use? How would you evaluate these materials? Considering your teaching practice, what elements would be fundamental in the elaboration of a didactic material about soils?* The answers showed that most teachers use textbooks (teachers 1,2 and 3); however, they do not believe this resource is enough to develop the theme in a deep and complex way, i.e., other resources and instruments, such as applications and maps should be included to develop a didactic sequence on the topic.

Finally, the question: *Have you ever heard of Ana Primavesi's stories? If so, how was*

your experience and what is your perception of the relation between her work and geography teaching? showed us that none of the teachers had heard about Ana Primavesi's work up to that moment.

In summary, the analysis of the questionnaire showed the little emphasis given to the theme 'soil' in the graduation courses and the distance between teachers' formation in physical-natural themes and the teaching practice. Additionally, the teachers described what contents are addressed by them in the study of soils and the main contents mentioned were: types of soils and their horizons, land occupation and the soil in agriculture. The results also showed that the theme 'soil' is frequently addressed in association with other topics, i.e., not as an independent one, thus receiving secondary attention.

The questionnaire allowed us to broaden our reflections in the remote synchronous meetings with the teachers, and below are some aspects mentioned by the teachers:

Teacher 1 stated that the theme 'soil' is little attractive, since it is usually addressed theoretically and little associated with materiality. Another interesting aspect brought by this teacher was the distance between the content presented in graduation courses and what should be taught at school, i.e., the lack of appropriate formation to teach physical-natural themes ends up affecting lessons about the soil. The teacher also remarked that the material should explore the stories in a ludic and pleasant way, considering different possibilities to promote learning among the diverse students' profiles.

Teacher 2 affirmed that the theme 'soil' is frequently seen as an accessory in the didactic materials, which makes teaching difficult. According to the educator, it is also a challenge to address the theme in urban environments, where students have little contact with soils. Regarding the material to be elaborated, the teacher emphasized the importance of including simple and objective practical activities in the lesson plans. This aspect was also pointed out by Teacher 3, who highlighted the importance of a practical material focused on the teachers' and students' reality and of a content systematization allowing a connection with other contents.

Teacher 4 remarked that the didactic materials and syllabuses treat the theme 'soil' as the result of a physical process or as a secondary element within the physical-natural themes and that it would be interesting to understand why this happens in order to invert this logic and avoid addressing this theme in a fragmented way, thus allowing the students to make connections about the content.

In summary, the respondent teachers pointed out the following aspects: the distance between the formation regarding physical-natural themes in graduation courses and the teaching practice; the lack of relations between such themes, the little emphasis given to the theme 'soil' in textbooks; the importance of a didactic material contextualizing the theme with simple activities and based on the reality; the relevance of thinking what contents will be developed throughout the process; the importance of addressing the theme 'soil' in association with other geography themes, emphasizing its specificities; and the importance of addressing the concepts in different ways, bringing ludic and interactive activities as well as various learning possibilities.

Based on the information from the dialogues with the teachers and the analysis of the stories by Ana Primavesi we were able to elaborate the didactic material, which comprises theoretical and methodological guidelines regarding the Study of Soils, the Living Soil,

the Historical-Critical Pedagogy in geography teaching and the potentiality of the stories selected for basic education.

2. *The didactic material elaborated – Study of Soils and Ana Primavesi's stories: conceptual guidelines*

The material was developed with the objective of providing guidelines about the Study of Soils and the development of the theme aligned with Ana Primavesi's stories. It is composed of 6 items: 1- *Introduction of the material*; 2- *Why study the soils*; 3- *Study of Soils and Living Soil*; 4- *The Historical-Critical Pedagogy in the Study of Soils, in the Living Soil and in Geography Teaching*; 5- *Ana Primavesi's stories in the Study of Soils and in Geography Teaching* and 6- *Bibliographic References*. Firstly, it explains the reason to address the theme 'soil' in geography from the perspective of Study of Soils and subsequently introduces the fundamentals of the Study of Soils and of the concept of Living Soil, presenting the basis of the didactic material elaborated: the Historical-Critical Pedagogy.

To bring the problematization of 'soil' as a resource that allows the structuration of society, the material starts with the question "Why study soils?". The following item, *Study of Soils and the Living Soil*, evidentiates the contribution of the concept of Living Soil for the Study of Soils, aiming at promoting significant learning, since the Study of Soils seeks to surpass the fragmented approach used to address this theme in basic education and work environmental education under a pedagogic approach (MUGGLER, et al, 2006).

In the items *Historical-Critical Pedagogy and The Study of Soils, Living Soil and Geography teaching* we tried to relate the study of soils and the Living Soil with the pedagogical conception upon which the research is based. In this sense, we discuss how the school contents are understood within a dynamic totality and analyzed under their social purpose and the potentiality of the stories by the agronomist engineer Ana Primavesi, mainly in what regards the concept of Living Soil and its importance for the study of physical-natural themes in school geography. From the conception of Living Soil brought by Primavesi, the physical-natural themes and the social practice are presented as a unit, a single reality in which the model of society adopted by the human being is directly reflected in the maintenance of the life of the soil, the plants, rivers and animals.

The item *Stories by Ana Primavesi on Soil Education and geography teaching* presents the stories chosen for the elaboration of the material, discussing the selection process that took into consideration the need to address physical-natural themes in geography teaching and the relations established between the physical-natural and social factors to support the educational function of the school: favor the formation of critical citizens, aware of their roles in the reality they live (MORAIS, 2013). Additionally, we discuss the potentialities of Ana Primavesi's stories (2016) for geography teaching, considering that the author tries to present the consequences - both to the society and the nature - of the environmental impact caused by humanity. This reality can be seen through the eyes of physical elements, that come alive and act upon society's choices. Still regarding this topic, we present the selected stories *Tatá, Pepe e Gigi: as três gotinhas de chuva* (*Tatá, Pepe and Gigi: the three little raindrops*); *O tietê* (*The tietê*); *A terra e o arado* (*The earth and the plough*) and *O Zéquinha do Jegue* (*Zequinha and the donkey*), bringing a

summary of each story, the systematization of the analysis (Chart 2), the conceptual map and a suggested activity.

3. *Evaluation and reformulation of the didactic material*

For the elaboration of the material, the teachers participating in the research were given the original version of the material², the chart with the evaluation indicators and the stories used to elaborate it. The evaluation performed by all the teachers was the basis for the reformulation of the material, the answers were analyzed and, considering the previous data, the dialogue with the teachers and the time available to finish the project, the final version of the material³ was concluded.

The evaluation by the teachers pointed out the need of a better presentation of the material, including the year of production, the context, the authors and suggestions of links and complementary texts to provide additional information for the educators. The educators emphasized the importance of conceptual maps to evidenciate the relations between the concepts and remarked that the material addressed the stories and geography under an integrated approach. Furthermore, the teachers recommended the use of the Historical-Critical Pedagogy approach to stimulate thinking from social practice and back to social practice, via problematization, instrumentalization and catharsis, and suggested a deeper reflection regarding the category of problematization, always presented through question in the original version of the material.

The teachers praised the material's graphic design, as well as the fact that the material favors a pedagogical practice that supports the investigation of the theme, since the stories can be addressed from a critical point of view.

The main alterations performed between the original and the final version were: orthographic and design corrections; significant changes in the presentation of the material, incorporating all the suggested alterations; implementation of other forms of problematization to avoid the idea that only questions can be used to problematize in the classroom.

With specific regard to problematization, a deeper understanding of the topic is needed to avoid immediatism and reductionism in what concerns the role of the Historical-Critical Pedagogy in the teaching process. Questions represent a possible didactic resource; however, they do not correspond to what problematization means while methodological moment in the Historical-Critical Pedagogy practice, which determines the most relevant contents of the social practice that needs to be systematically transmitted (MARSIGLIA, MARTINS, LAVOURA, 2019). Thus, it is of utmost importance to understand the theoretical elements and the dialectic character of the Historical-Critical Pedagogy to analyze what contents regarding the study of soils are relevant to the social practice and should be addressed in each story; however, the material comprises some

² Access to the original version of the material:
<<https://drive.google.com/file/d/1zGJvptx0Ca4gPm6xm1c17APMUWDIT0Hc/view?usp=sharing>>

³ Access to the final version of the material: <
<<https://drive.google.com/file/d/1r9LzWdr0xfsD3qUetBPcePQQP5SYrZPP/view?usp=sharing>>

questions related to this essential theme that can be used as a didactic resource throughout the activities.

CONCLUSION

The results indicate that the didactic material elaborated and the stories selected contribute for the development of physical-natural themes in geography based on the conception of Living Soil, articulating such themes with human actions, since the Critical-Historical Pedagogy approach allows the systematization of central problematizations in the study of soils: the relation between society and nature. Geography, grounded in the production of geographic space and contradictory relations, contributes for the study and the analysis of environmental issues, since it provides the basis to develop physical-natural themes at school.

Moreover, we highlight the importance of the teachers' participation throughout the research, aligned with our view about the relevance of understanding the school culture while developing a study on geography teaching. Their participation allowed us to establish relations between the school routine, the research and the didactic material elaborated, supporting our understanding in what regards social processes that are frequently neglected by the scientific investigations: the relations of power and control within the educational policies, in the curriculum and in the classroom, as well as the constant negotiation of meanings and the production of subjectivities and identities in the different educational relations (GONÇALVES, 2011).

Therefore, we could analyze the interface between the teaching procedures to address physical-natural themes and the Historical-Critical Pedagogy to elaborate a didactic material comprising guidelines to the teacher. Nevertheless, the new possibilities offered by such material are numerous and not limited to those presented herein.

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