

**SOILS AND EDUCATIONAL PRACTICES: STUDY FROM THE ARTICLES
PRESENT IN THE AXIS TEACHING GEOGRAPHY IN THE BRAZILIAN
SYMPOSIUM OF APPLIED PHYSICAL GEOGRAPHY (SBGFA) 2019**

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ABSTRACT

This text refers to the results of scientific initiation research that continued the analyses and discussions that have been held since 2014, in a research entitled "Teaching Geography at the Brazilian Symposium on Applied Physical Geography: study of contents and geographical and pedagogical approaches from 2003". In this work, the specific objective is to evaluate the geographic approach and knowledge of Soil present among the articles of the event, as well as the didactic-pedagogical references presented. It is understood as important and necessary to discuss the relationship between society and nature in the scope of school geography, especially the discussion of this physical-natural component and its appropriation and use, capable of configuring different landscapes and territories. The documentary and exploratory research follows the methodology of content analysis, which includes several readings of each text, identification of categories, analysis of soil approaches and conceptions and proposed practices. Despite the perceived search for the break with patterns of a traditional teaching, it was found that the approach of the theme in the works remains, to a large ly, academicist and more focused on the understanding of the Soil as an isolated and disconnected element of space. More than 70% of the studies discuss the soil issue from regional and global scales, disregarding the geography of the student and, consequently, the search for a more significant soil geographic education. In addition to this aspect, less than 50% of the studies present important conceptions in geography practices, such as the definition of procedural and value contents and the presence of constructivist approaches to teaching.

**SOLOS E PRÁTICAS EDUCATIVAS: ESTUDO A PARTIR DOS ARTIGOS
PRESENTES NO EIXO ENSINO DE GEOGRAFIA NO SIMPÓSIO
BRASILEIRO DE GEOGRAFIA FÍSICA APLICADA (SBGFA) 2019**

RESUMO

Este texto refere-se aos resultados de pesquisa de iniciação científica que deu continuidade às análises e discussões que vêm sendo realizadas desde 2014, em pesquisa intitulada "Ensino de Geografia no Simpósio Brasileiro de Geografia Física Aplicada: estudo dos conteúdos e das abordagens geográfica e pedagógica a partir de 2003". Neste trabalho, o objetivo específico é avaliar a abordagem geográfica e o conhecimento de Solo presente entre os artigos do evento, bem como os referenciais didático-pedagógicos apresentados. Entende-se como importante e necessário discutir a relação sociedade-natureza no âmbito da Geografia escolar, em especial a

discussão deste componente físico-natural e sua apropriação e uso, capaz de configurar diferentes paisagens e territórios. A pesquisa de natureza documental e exploratória, segue a metodologia da análise do conteúdo, que compreende várias leituras de cada texto, identificação de categorias, análise das abordagens e concepções do solo e das práticas propostas. Apesar de ser percebida uma busca pelo rompimento com padrões de um ensino tradicional, foi constatada que a abordagem da temática nos trabalhos permanece, em grande parte, acadêmica e mais voltada para a compreensão do Solo como um elemento isolado e desconexo do espaço. Mais de 70% dos trabalhos discutem a questão do Solo a partir de escalas regional e global, desconsiderando a geografia do aluno e, conseqüentemente, a busca por uma educação geográfica do solo mais significativa. Além desse aspecto, menos de 50% dos trabalhos apresentam concepções importantes nas práticas de Geografia, como a definição de conteúdos procedimentais e valorativos e a presença de abordagens construtivistas de ensino.

INTRODUCTION

This paper presents results and discussions from scientific initiation research, which is part of a larger research, based on the investigation of the articles present in the field of the Brazilian Symposium on Applied Physical Geography (SBGFA). To date, trends in the teaching of physical geography have been analyzed, with Clemente and Souza (2014); the contents of Climatology and Geomorphology (FONTE, 2017); the survey of pedagogical approaches to the contents of Physical Geography (PEREIRA, 2020), among others. Part of the results were presented at the XVI Brazilian Symposium on Applied Physical Geography held in 2015, in the city of Teresina, during the round table entitled "Alternative resources for teaching physical geography" and in scientific journals such as Taroco and Souza (2015), Pereira and Souza (2022) and events.

The SBGFA is a scientific event that began in 1984, having biannual periodicity, and that from the second half of the 1990s included the issue of teaching content related to physical-natural components¹, in its own axis, being the focus of interest of this research. The inclusion of this axis reveals the interest of the scientific community to know and disseminate theoretical and practical works produced in the different subareas of the field of physical geography, related to teaching and didactic issues.

The study of geographic contents in basic education comprises an important process for the interpretation of space, as well as for the formation of the notion of citizenship by the subjects. This can be constructed "through the practice of construction and reconstruction of knowledge, skills, values that expand the capacity of children and young people to understand the world in which they live and work" (CAVALCANTI, 2002, p. 47, our translation). This concept encompasses not only the need to understand the world in which we live, but also, mainly, the role that each, or groups of individuals, has in the formation, organization and transformation of society and geographical space. This can be apprehended through the categories of socio-spatial analysis such as Landscape, Place, Territory, Region, among others.

In the present research, the specific interest about the study of soil occurs because it is among the components of nature widely explored by humans, through their economic activities and ways of life. Nowadays, the consumption model implies a growing search for natural resources, following its path of exploration and degradation, mainly on the soil in the urban and rural areas. This fact leads to reflection on the importance of discussing

¹ This terminology is discussed by Morais e Roque Ascensão (2021).

the relationship of society and nature in the scope of school geography, especially the discussion about the Soil component and the appropriation and use of it by society, configuring different landscapes and territories.

In geographic science, soil can be understood as the surface layer of the altered or decomposed Earth crust in contact with the atmosphere and with the living universe or biosphere (COELHO; TERRA, 2001). According to Embrapa (1999), soil is the surface layer of the earth's crust resulting from the combined action of the formation factors: source material (rock), climate, living organisms, relief and time. Soil is considered as the natural environment capable of supporting plant growth. In these definitions, the approach falls on the genesis and formation of the soil, widely discussed in academic geography.

As a component of the landscape, the soil is shown as an integrator of the different elements that compose it. The study of the landscape is fundamental to unveil the processes that act by modifying rocks, soils and relief forms (MARQUES, 2003; NAKASHIMA *et al*, 2017), from the perspective of the 'natural' landscape, being essential to unveil the role of the soil in the landscape, which comprises relationships between form and content, appearance and essence (SOUZA, 2015).

Therefore, in the teaching of Geography, the soil should be conceived and approached as a physical-natural component of space, composing landscapes and territories produced from the social, political, economic and cultural relationship. In textbooks, when discussing the manifestations of geographical phenomena, based on the physical-natural picture, whether on the soil, relief or climate, the questions related to the process of space production are put in the background, or are not even inserted. The natural picture is presented from the perspective of the untouched, and man does not insert himself as an integral part of nature (MENDES, 2017) and the content, in the specific case of the soil, is treated considering its genesis and uses, with conceptions similar to those treated in Academic Geography, as verified by Silva (2019).

Based on these initial considerations, the research carried out on the soil issue in the annals of the SBGFA (2019) considered as hypothesis the possible approach of the soil, in the texts published in the event, similar to the academic one, privileging the concepts, genesis and formation of soil profiles. In this perspective, the soil is taken only as an element of the landscape, as in the approach of classical geography. As for educational practices, it was believed that those involving fieldwork would be common among the works, because it is an important resource and methodology in science and geography teaching.

In order to investigate these hypotheses and evaluate how the Solo content has been treated in the educational practices of Geography, the methodology of analysis and analytical treatment of the works was outlined, which will be presented in the following topic

METHODOLOGICAL PATH

According to the objectives and design adopted, the research, of the descriptive type, of the bibliographic/documentary genre, had as its primary source of data the analysis of articles published in the annals of the SBGFA. It considered the idea of conceptual,

procedural and atheist contents, in teaching proposals, according to the discussion of Zabala (1998), Cavalcanti (2002) and the aspects that should be considered in meaningful learning, proposed by Saviani (2005). This procedure required other readings related to school geography and its relations with the natural physical components of space, with emphasis on soil education, based on authors such as Suertegaray and Nunes (2001), Afonso and Armond (2009), Morais (2011; 2013), Santos and Isaka (2015), Mendes (2017), among others.

According to Gil (2002, p.43 and 45, our translation), a bibliographic research "is developed based on materials already elaborated, consisting mainly of books and scientific articles" [...] and "documentary, uses materials that have not yet received some analytical treatment or that can be reelaborated according to the object of the research", as carried out here, from the fields of the SBGFA.

These annais had been previously categorized from Pereira's research (2020), which carried out the database called "Categorization - SBGFA 2019", which includes the survey and classification of the 143 articles published in the annais of the Teaching axis of SBGFA - 2019. From this basis, the 10 articles already categorized in the area of "Pedology" by the author were selected. Next, the following terms were investigated in the 'Keywords' column of the data processing worksheet elaborated by Pereira (2020). This procedure aimed to locate other possible articles that could also be reevaluated and considered in the soil theme. With this search, 14 articles were identified and analyzed, but only 1 was included in the research parameters and was included among the articles that would later be analyzed in greater depth. This fact reinforces that the methodology used in the larger research and previous studies have been able to identify and classify the studies satisfactorily.

In the technical procedure of the research, a preliminary analysis of general aspects of the articles related to the identification and characterization of the works regarding the nature of the work (theoretical, methodological or experience report), institutional origin and region of work, level of education of the authors and type of institution (public or private) was performed.

After this procedure, the articles were read and the data taken received a qualitative treatment, performed from the following leading questions, which also conducted this research: i) in the SBGFA (2019), soil is approached under which geographical approach and conception of knowledge: academic (Pedology) or school (soil as a spatial component)? ii) Among the didactic-pedagogical possibilities, how is solo content worked in geography teaching, based on SBGFA articles? iii) Among the educational practices with solo content, are "driving ideas" (CAVALCANTI, 2002) contemplated or present in the scope of the work?

During this qualitative analysis process, added to the above questions, the following aspects were sought to identify in the studies: - which didactic resources were used or indicated in the studies; - the subject or content on soil discussed in the text; - the scale of study present in the proposal or subject of the text. This stage aimed to verify more information about how the solo subject of the axis "Methodologies for the teaching of physical geography in the school environment", of this event, was being explored, seeking to examine the hypotheses previously presented.

THE SOIL IN SCHOOL GEOGRAPHY AND SOME REFERENCES FOR SIGNIFICANT TEACHING

The theoretical framework for analysis and discussion of the results is based on two subjects: Soils and Geographic Education. Thus, before entering into the analysis and discussions of the articles, it is important to make notes related to the teaching of Geography and possible paths to the student's learning process. It has done discussing the importance of the Soil approach as a means for understanding fundamental aspects about geographic space and the spatiality of the phenomena that constitute it and explain certain processes or "geographical situations" (SILVEIRA, 1999).

In this way, the "driving ideas", listed in a provisional balance sheet carried out by Cavalcanti (2002), in which four concepts were organized for didactic-pedagogical orientations, which increasingly gain strength in the field of geography teaching, is considered as an important reference. The author describes them by referring to four aspects/approaches,

Constructivism - as a basic attitude of work with school geography; the **geography of the student**- as a reference of geographic knowledge built in the classroom; the **selection of basic geographical concepts** to structure teaching content and the **definition of procedural and value content** for the orientation of actions, attitudes and socio spatial behaviors. (CAVALCANTI, 2002, p. 30, our griffin and translation).

According to the author, constructivism, although it may have several conceptions, comprises treating Teaching as a process of knowledge construction and the student as an active subject of this process, because of the student's interaction with the objects of knowledge. According to Vesentini (1999, p.20, our translation):

This schooling has to be based on a teaching no longer "technical", as in the time of Fordism, but "constructivist", in order to make people think on their own, learning to face new challenges, creating new answers instead of just repeating old formulas.

The author argues that teaching is a process that composes human formation in its broadest sense, picking up all dimensions of education: intellectual, affective, social, moral, aesthetic, and physical. In this sense, it needs to be focused "not only on the construction of concepts, but also on the development of skills and abilities to operate this knowledge and to the formation of attitudes, values and convictions before the knowledge present in the school space" (CAVALCANTI, 2002, p. 38, our translation).

It is essential to carry out a teaching and learning process that considers the experience and experience of each student during this process, that is, the knowledge that each student acquires in his daily life, in his geography. In the geography of the student, the concepts are constructed by the students and not "deposited by the teachers". The teacher, in this case, is the mediator, the "bridge" between the content and the construction of the concept.

The selection of geographical concepts comprises the planning and organization of key concepts to guide the process of knowledge construction during the teaching of certain content. To Cavalcanti (2019), place, landscape, territory, region, nature and society can be considered as more comprehensive concepts for the formation of what can be called geographical thought.

Regarding the definition of procedural and valuable contents, the author states that the teacher's work goes beyond the construction of concepts. According to Coll Salvador (1977), through Cavalcanti (2002, p. 38, our translation), it is also necessary to develop "skills and abilities for students to operate knowledge, as well as formation of attitudes, values and convictions, present in procedural and valuable content".

In this perspective, there is a significant dialogue with previous propositions coined by Zabala (1998). Cavalcanti (2002) explains that he considers procedural contents as work so that the student knows and uses the procedures of geographic studies, such as observation of landscapes, use of statistical and cartographic data. Regarding the attitudinal contents, these are "contents that help the student to act in space, to influence its production according to certain values and convictions [...]" (CAVALCANTI, 2002, p. 40).

Morais (2011; 2013) correlates the physical-natural themes with citizen education, stating that these themes constitute important contents for the education of students. However, more than understanding the classification of relief or classifying the different types of soil, it is necessary that this knowledge help in the formation and daily performance of the subject.

It is essential to consider the teaching of these themes in order to mobilize knowledge that evidences the dynamics and relationship between the themes presented here. Thus, students can be guided towards the effective construction of knowledge, which enables the development of a real reading ability of the world, as prethought by Freire (2002), seizing the dynamics and transformation of space in the light of the society-nature relationship, in a critical way.

In this sense, the teaching of physic-natural components should also include anthropic interventions in space, which are inherent to the process of use and occupation, but have been enhanced with the evolution of technologies and the consumption model of today's society. After all, destructive behaviors in the exploitation of natural resources occur more and more frequently and have led several of these resources to exhaustion, including soil, in several areas (MENDES, 2017).

This problem arouses the need to understand both the physical-natural dynamics and the way society operates in the environment. On this, Morais (2013, p. 14, our griffin and translation) considers that:

[...] these reflections aim to make explicit that **society needs to understand that existing environmental problems**, both in urban and rural areas, **involve the relationships** that are established **between physical-natural and social factors**.

The discussion of the relationship between society and nature is, then, an essential factor for the constitution of a geography teaching consistent with what the school, as a

privileged space for human and citizen education, should provide to the student (AFONSO; ARMOND, 2009).

In view of the demarcation of these perspectives, work with the soil fulfills its role as a relevant content in the teaching of Geography, since daily life is permeated by relations established with it, since almost all human activities are developed on the soil, or, part of it as agriculture, livestock, housing, displacements, among others (SANTOS; ISAKA, 2015; MENDES, 2017). Therefore, the study of soil, as a spatial component, makes it possible to make a reading of the landscape, of space, in an integrated way, considering the relationship of appropriation, occupation and/or conservation.

Having said that, considering the importance of approaches that discuss the physical-natural components, with emphasis here on soils, and the relationship between society and nature, the essential role of geography for these discussions in the school space stands out. It is also emphasized that this process should take place without losing sight of the importance of marking teaching methodologies based on consistent didactic-pedagogical references. Based on these ideas, the analyses performed are presented and discussed in the following topic

RESULTS AND DISCUSSION

When performing the categorization of the data, it was identified that the category referring to Pedology, or soil teaching, in the edition of the SBGFA, held in 2019, totals 7.7% of the one hundred and forty-three (143) works presented in the event, teaching axis. In the treatment of this particular category, it was found that 46% of the articles came from authors belonging to institutions in the Northeast, 36% from the Southeast and 18% from the South, and no work of institutions in the other regions. It is possible to assign the most expressive number in the Northeast because the event was held in this region, in face-to-face format.

Of the total (11) of the papers related to solos, two (2) are prepared by graduate authors and nine (9) by undergraduate students. Among the texts, six (6) consist of expanded abstracts and five (5) complete papers. The analysis of the type of work (Chart 1) shows that 45.4% presented an approach with emphasis on the methodological aspect, 36.4% in reporting experiences on interventions and activities and 18.2% fundamentally theoretical, comprising bibliographic review and/or examining the content of textbooks.

Table 1: Classification of the works of the category Soils, according to their nature.

Nature of Work	Quantity	
	Absolute	Relative
Methodological	5	45,4%
Experience Report	4	36,4%
Theoretical	2	18,2%
Total	11	100%

Source: Research Survey, 2021.

Regarding the presence of the driving ideas in the proposals of pedagogical practices of the works submitted to the teaching axis, and classified in the pedology or solo branch, it is verified that each aspect (constructivism, geography of the student, selection of content and procedural and athetiudinal content) are partially contemplated as represented in Figure 1.

Of the total of eleven (11) studies analyzed, 27.2% showed attention to the "Geography of the student" in their work; 45.4% showed emphasis on constructivist approach; moreover, in 45.4% of the studies, the concern with procedural and value content was explicit, that is, to develop content and activities that could contribute to the understanding of content and affirmative action's before the environment. In addition, 63.3% showed the choice of contents and key concepts chosen by teachers.

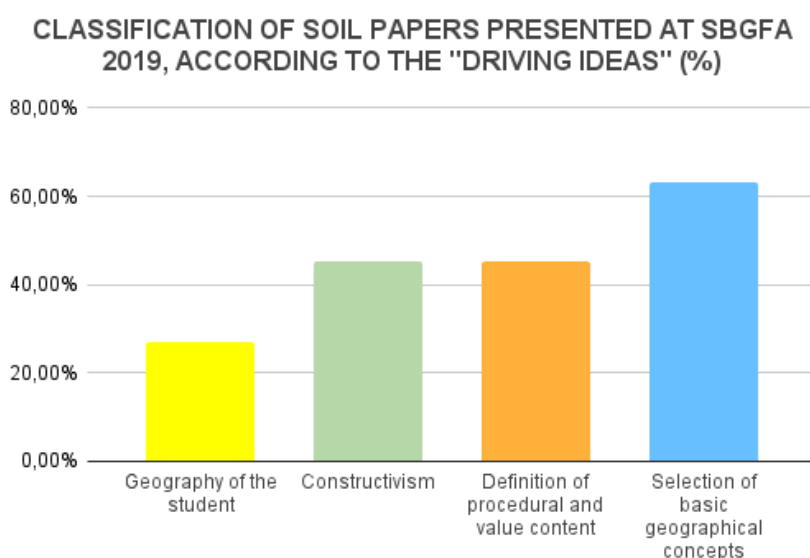


Figure 1: Survey of soil papers presented at SBGFA 2019, according to the "driving ideas".
Source: Research Survey, 2021.

In a pedagogical practice with geography contents, it is expected that the four aspects are present in the proposals satisfactorily. The absence of geography of the student in a considerable number of studies (72.7%), reveals that the soil content, present in the teaching axis of the SBFGA (2019), is not contextualized from the reality of the students, as many authors of education, among them Saviani (2005). According to Castro (1995, p.120-121, our translation), "the geographical analysis of phenomena requires objectify the spaces on the scale in which they are perceived", and the scale is also understood as a methodological issue. In this sense, it is understood that the scale approach considered in most studies did not take into account what the students experienced and perceived and also favored the regional and global scale of the phenomenon studied and/or discussed.

Regarding the definition of procedural and valuable contents (45.4 %), a greater number of studies that contemplate this aspect are perceived, but still this number represents less than 50% of the total work. It is pertinent to highlight the importance of

the approach to this content, which considers the teacher who encourages the student to think, to be a citizen, to use the concepts and contents learned in the classroom, in real situations (CAVALCANTI, 2002). Therefore, its presence in the works could be more significant and comprehensive, considering the importance of critical and citizen training.

The selection of geographical concepts stands out among the other aspects. This fact can be explained by considering that the work with geography does not dispense with concepts, which may be explicit or implicit in the proposals.

The lower percentages (less than 50%) for the aspects of student geography, constructivism and definition of procedural and atheusinal content, reveal that somehow these aspects go hand in hand. For, the constructivist pedagogical approach implies considering both what the student already knows - from his experience and geography - and the meaning that the content brings to his life, for his possible mobilization, towards socially important procedures and attitudes.

From the analysis of didactic resources and proposals of activities present in the investigated articles, there is interest in the use of more playful, interactive and exhibition resources so that students do not only dislike concepts but also, yes, effectively understand the subjects, thus distancing themselves from a traditional teaching. During the analysis of didactic-pedagogical proposals, it was observed that the main resources used (Figure 2) were games, followed by exhibition workshops, models and the use of real soil fragments, totaling 66.6% of the resources used throughout the category. The other 33.4% refer to the use of textbooks, fieldwork, gymkhana, debate, etc.



Figure 2: Representation of the most used resources in the solos category.

Source: Research Survey, 2021.

Another point that also draws attention in the analyzed results is that only in one of the articles was reported the experience of fieldwork, collecting and enjoying resources from the school's surroundings. This fact reinforces that, although there are alternatives for a more accessible fieldwork, near the school, or within the school itself - places of common coexistence of all students - there is still little realization of such a practice. The reasons for this fact are diverse and it is not appropriate to quote them here, but the fact shows that it is necessary a resignification of the fieldwork, as a teaching methodology that can happen in the school environment, not being necessary to travel great distances. This

finding refutes the hypothesis that the work would be as an important activity present in the pedagogical proposals of the analyzed studies. However, the other hypothesis related to the approach of soil content is confirmed, being the content closer to the academic, with attention to the understanding of soil genesis and classification than to the discussion of the soil as a component of the landscapes and territories in interaction with the other components.

Although it is mentioned, in part of the works, the importance of associating the theme Solos with the other components, different from the conception of being just an isolated element, when working with the soil, most of the proposals highlight the formation, quality and use, even those who used elements from the school's surroundings. The relationship between society and nature was little mentioned and practically not developed in any of the works.

Conclusions

The study and analysis of the 11 articles, attributed to the area of Pedology in the annals of the Brazilian Symposium on Applied Physical Geography (SBGFA) in 2019, made it possible to evaluate and understand the meaning that the theme Solos was addressed in the axis "Methodologies for the teaching of physical geography in the school environment". The result reinforces the need to build a geography teaching based on a dynamic reading between nature and society, not only for the construction of concepts, but also for the development of capacities and skills for the formation of attitudes and values, being the physical-natural components of the space essential elements for this.

Considering this perspective, it is important to reaffirm the existence of social, political and economic relations associated with soils that should be addressed in geography teaching. However, in general, only concepts about their formation and use are addressed in the works, leading to the main hypothesis presented in this article, which would be that the approach on soil in the published works had a more academic bias.

Therefore, in the analysis performed, it is observed that some elements need attention: the approach of soils in the works still remains, to a large academicism and more focused on the understanding of the soil as an isolated element than a component of the geographical space in its systemic complexity, integrated and scalar. The scales of geographic analysis are also an element of concern, since in more than 70% of the works present in the category consider the soil from regional and global scales, disregarding the student's experience and, consequently, the search for a more significant geographical education of the soils.

Moreover, it is important to emphasize that most articles already discussed and presented the use of more illustrative teaching resources, from which the student obtains a broader perception of the contents worked. After all, even if in these contents it was ideal to go to fieldwork; it is known that it is often not a possible reality in most schools.

Finally, it is noteworthy that the continuity for this analysis is relevant, because from the current work there are parameters to ascertain whether the academic bias will continue, increasing or reducing, in future editions. In addition to this aspect, it is possible to verify whether there will be greater interest in addressing the soil theme in the teaching axis,

since among the 143 papers published in the Teaching axis (SBGFA, 2019), less than 8% were focused on the soil approach.

.Acknowledgments

We thank the Pro-Rector of Research and Graduate Studies (PROPE) and PIBIC of the Federal University of São João del-Rei, which institutionalized and enabled the realization of this research in specific and granted resources for the development of so many other related works.

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