

**FIELD CLASS AS A STRATEGY IN BIOGEOGRAPHY TEACHING AT THE
NATURAL MONUMENT OF THE POTI RIVER FOSSIL FOREST IN
TERESINA, PIAUÍ**

Lucas Alves Pereira

<https://orcid.org/0000-0002-4499-5463>

Federal University of Piauí

Bartira Araújo da Silva Viana

<https://orcid.org/0000-0002-7288-3119>

Federal University of Piauí

163

ABSTRACT

This manuscript will discuss the teaching of biogeography in the curricula of elementary schools and the use of the Fossil Forest Natural Monument of the Poti River in the municipality of Teresina-PI as a teaching tool for geography teachers from the organization of a field class. Thus, the general objective is to analyze the importance of the field class as a methodological practice for teaching the contents of school biogeography, highlighting a case study in the Fossil Forest Natural Monument of the Poti River. The specific objectives are i) report on school biogeography highlighting the content and skills provided in the Base Nacional Comum Curricular (Common National Curriculum Base, BNCC), ii) discuss the biogeography teaching in the textbook context, and iii) propose a field class in the Fossil Forest Natural Monument of the Poti River as a methodological tool for teaching school biogeography. The analyses carried out on-site followed a qualitative way assisted by the literature available in articles and specialized books in the area. The paleobiogeographic collection in the Natural Monument presents Permian vegetal fossils that help students to understand the subjects in geography classes. Thus, practical field classes related to the physical geography teaching in the Natural Monument of the Fossil Forest of the Poti River provide a significant teaching-learning process for the students, besides generating a sensitization/awareness about the preservation and conservation of such a conservation unit.

Keywords: Fossil Forest; Biogeography; Geography teaching; field class; Physical Geography.

**AULA DE CAMPO NO MONUMENTO NATURAL DA FLORESTA FÓSSIL
DO RIO POTI, EM TERESINA – PI COMO ESTRATÉGIA DE ENSINO DE
BIOGEOGRAFIA ESCOLAR**

RESUMO

O artigo discorrerá sobre o ensino de Biogeografia disposto nos currículos das escolas de ensino básico e sobre a utilização do Monumento Natural Floresta Fóssil do rio Poti, localizada no município de Teresina – PI, como ferramenta didática pelos professores de Geografia, a partir da organização de uma aula de campo. Assim, o objetivo geral do estudo é analisar a importância da aula de campo como prática metodológica para o ensino dos conteúdos da Biogeografia Escolar, destacando um estudo de caso no Monumento Natural Floresta Fóssil do rio Poti. Os objetivos específicos são: i) relatar sobre a Biogeografia Escolar, destacando os conteúdos e habilidades dispostos na Base Nacional Comum Curricular (BNCC); ii) discutir sobre o ensino de Biogeografia no contexto do livro didático; iii) propor uma aula de campo no Monumento Natural Floresta Fóssil do rio Poti como ferramenta metodológica para o ensino da Biogeografia Escolar. Realizou-se um estudo *in loco*, onde as análises foram feitas de forma qualitativa com auxílio dos materiais bibliográficos dispostos em artigos e livros especializados na área. Constatou-se que o acervo paleobiogeográfico presente no Monumento Natural apresenta fósseis vegetais datados do

período Permiano e facilita a compreensão dos alunos acerca dos assuntos trabalhados nas aulas de Geografia. Concluiu-se que, por meio de realização de aulas práticas de campo, relacionadas no ensino de Geografia Física no Monumento Natural da Floresta Fóssil do rio Poti, pode-se proporcionar um processo de ensino e aprendizagem significativo para os estudantes, além de gerar uma sensibilização/conscientização acerca preservação e conservação dessa Unidade de Conservação.

Palavras-chave: Floresta Fóssil; Biogeografia; ensino de Geografia; aula de campo; Geografia Física.

INTRODUCTION

164

The lack of interest in physical-natural content in geography on the part of students is recurrent. The memorization of concepts is a common practice in studies of contents related to physical geography. Such a reproduction contributes to the disinterest concerning a geographic science within society, requiring a methodological proposal that promotes the construction of knowledge with the teacher. For this reason, this research is necessary due to the concern regarding biogeography teaching in schools. Thus, it appears as a crucial point in elementary education since the components in this branch of geography are increasingly less present in school curricula due to marketing agents.

The field class proposed in this research is a teaching strategy that enables the teacher to work on various topics in a single lesson, stimulating curiosity outside the classroom. Despite the logistical processes in a field class, the development of this methodology is elementary to the understanding of geographic space in its entirety because "[...] this resource also acts as a facilitator of the pedagogical work, giving more meaning and purpose to the contents discussed with students in the classroom" (NUNES et al., 2016, p. 2).

The alternative thought for a field is the use of the Fossil Forest of the Poti River in Teresina-PI since it encompasses several contents pertinent to biogeography. It is a paleobiogeographic collection with samples of fossilized tree trunks, revealing great scientific and touristic potential. However, it is in a situation of abandonment, showing the urgency of its use for education, aiming at the awareness of future generations in preserving and conserving this space.

The general objective is to analyze the importance of the field class as a methodological practice for teaching the contents of school biogeography, highlighting a case study in the Floresta Fossil Natural Monument of the Poti River. The specific objectives are i) report on the school biogeography highlighting the content and skills provided in the BNCC, ii) discuss the teaching of biogeography in the textbook context, and iii) propose a field class in the Fossil Forest Natural Monument of the Poti River as a methodological tool for the teaching of school biogeography.

The methodology treated in this paper concerns the literature about the content proposed in this research, being in academic articles, books, and documents related to geography education and teaching. The theoretical basis of the research was based on Lima (1998), Cardoso and Silva (2018), Figueiró (2015), Campos (2019), Pontuschka, Paganelli and Cacete (2007), Vasconcelos, Lima and Moraes (2016), Quaresma and Cisneros (2013), and Rodrigues and Otaviano (2001), among others.

As for the data relating to the object of study, the information ascertained from the materials goes beyond specialized documents since it has considered an on-spot analysis (Figure 1) of the space corresponding to the object of study. Also, the research survey on the Poti River Fossil Forest Natural Monument assisted the development of this research.

BIOGEOGRAPHY IN THE SCHOOL CONTEXT

The biogeographical study has a strong relation to the study of the landscape "[...] based on an integrated analysis of its elements" (FIGUEIRÓ, 2015, p. 50). Thus, the search for understanding the landscape characteristics is at the core of biogeography in a geo-ecological sense. Therefore, "biogeography is an interdisciplinary field of knowledge of geography and biological sciences that researches the distribution of living things in time and space" (BROWN; LIMOLINO, 2006 apud FURLAN et al., 2016, p. 100).

Biogeography teaching is not a known content as other recurring themes to school geography regarding physical geography, although widely used in various segments of geographic science throughout the school levels. In the BNCC, this knowledge can be specified in contents that encompass nature, "[...] articulating physical and human geography, in emphasis to the discussion of physical-natural processes of the Earth" (BRASIL, 2017, p. 364). Teaching physical-natural elements in school, according to the BNCC, may assist content appropriation, giving students better living conditions.

To better understand the above, Table 1 shows how biogeography is represented in the contents of elementary education, paralleling it to the academic discussion. It is worth pointing out that the didactic transposition of content from academic to school geography is distinct. The first one attends to how a professional will act in communities through the work of the geographer, different from the school, which prepares the student to live in society.

Table 1 – Biogeographic contents over the school grades and skills to develop, according to the BNCC.

Code/Grade	Skills for geography, according to BNCC.	Elementary education	Academic education
EF06GE01 (6 th grade from elementary school)	Compare modifications of landscapes in places of living and the uses of these places in different times.	Age and Evolution of the Earth	Geomorphology
EF06GE02 (6 th grade from elementary school)	Analyze landscape modifications by different types of society, emphasizing native peoples.	Continental Drift Geological Structure of the Earth	
EF01GE10 (1 st grade from high school)	Describe characteristics of their living spaces related to the rhythms of nature (rain, wind, heat, among others).	Weather and Climate	Climatology
EF06GE03 (6 th grade from elementary school)	Describe the movements of the planet and their relationship to the general circulation of the atmosphere, atmospheric weather, and weather patterns.	Atmospheric temperature	
EF06GE05 (6 th grade from elementary school)	Relate climate patterns, soil types, relief, and vegetation formations.	Atmospheric pressure	

EF01GE10 (1 st grade from high school)	Describe characteristics of their living spaces related to the rhythms of nature (rain, wind, heat, among others)	Air masses	
EF01GE11 (2 nd grade from high school)	Associate changes in clothing and eating habits in their community over the years, resulting from the variation of temperature and humidity in the environment	Classification and natural climate change	
EF07GE11 (7 th grade from elementary school)	Characterize the dynamics of the physical-natural components in the national territory, as well as their distribution and biodiversity (Tropical Rainforests, Cerrados, Caatingas, Pampas, and Araucaria Moist Forests)	Biodiversity and ecosystems	
EF08GE23 (8 th grade from elementary school)	Identify Latin American landscapes and associate them, through cartography, with the different peoples of the region based on aspects of geomorphology, biogeography, and climatology	Vegetal Formation	Morphoclimatic domains
EF09GE07 (9 th grade from elementary school)	Analyze the physical-natural components of Eurasia and the historical-geographical determinants of its division into Europe and Asia.	Polar Regions	
EF09GE16 (9 th grade from elementary school)		Temperate Regions	
EF09GE17 (9 th grade from elementary school)	Explain the physical-natural characteristics and the form of occupation and land use in different regions of Europe, Asia, and Oceania	Tropical or intertropical regions	
EF02GE11 (2 nd grade from high school)	To recognize the importance of soil and water for life, identifying their different uses (planting and extraction of materials, among other possibilities) and the impacts of these uses on everyday life in the city and countryside	Desert Regions	
		Mountainous Regions	
		Formation and use of rivers	Hydrography
		Use and degradation of seas and oceans	

Source: Brazil (2017).

As shown in Table 1, school biogeography is linked to physical-natural studies and is quite segmented. Note that biogeography is present in the contents of elementary (6th to 9th grade) and high schools. Morais (2011, p. 38) explains that "[...] the teaching of physical-natural themes in basic education is related to all these elements. Therefore, teaching such a subject in schools is not enough for the teacher to be a geography specialist".

Cardoso and Silva (2018, p. 23) disclose the idea that the contents of physical geography, from the curricular reformulation and the implementation of new courses. They say that "[...] contents on climatology, geology, geomorphology, hydrology, and biogeography start to assume less and less relevance in the curriculum of undergraduate courses and school geography."

The curriculum reformulation can be clarified through a capitalist bias since these contents do not meet the market desire, and education is a labor-reproducer instrument that does not approach content that is not profitable from the marketing point of view of education. Branco et al. (2018, p. 48) report that "[...] the current scenario leads the citizen

formation through paths contrary to the emancipation of the subject, causing the free and critical training to lose space in the educational field."

SCHOOL BIOGEOGRAPHY AND TEXTBOOKS

The recurring problem with the fragmentation of physical geography comes from the fact that students have the perception that, when studying the physical-natural contents in the geography textbooks, they only need to memorize concepts, to the detriment of the understanding of an integrated system that directly or indirectly influences their lives. The student stores concepts and replicates them in an assessment. Freire (1987, p. 38) criticizes this model of education since "[...] in this distorted view of education, there is no creativity, no transformation, no knowledge. Thus, such a mnemonic practice from textbook contents prevents students from constructing geographic knowledge.

As it is part of a specific theme of geography and biology alike, and approaching the knowledge of other sciences, the contents of biogeography present in textbooks in elementary education end up going through the lives of students without making them aware of the importance. To Campos (2019), the lack of perception based on shallow and generalizing concepts can make biogeography uninteresting, considering that its knowledge in school lies in classes supported by textbooks. In the same line of thought, the author explains that "[...] the teaching of biogeography in a traditional practice with the textbook is fruitless because the student does not take it to life since it does not make sense in their daily lives" (CAMPOS, 2019, p. 1669).

Besides the aspects raised, there is a movement in geography teaching for dissociating from the textbook since it does not deal with the particularities in a regional context. "From these assumptions, school geography and the textbook cannot park in the scientific paradigm in questioning, but they must remodel themselves and bring within their scopes an integrative approach to geographic science and teaching themes" (SILVA JUNIOR; ARAÚJO; NASCIMENTO, 2016, p.3).

The contents get intenser to the extent that the knowledge cannot be a hostage for textbooks since the observation and perception of space is a pillar for geography and biogeography. It is also important because it deals with young people learning biogeographic knowledge from what the teacher explains in the classroom.

Thus, for the study of school biogeography to become rewarding and meaningful, the implementation of dynamic methodological tools in teaching, such as the field class, can contribute to the establishment of connections between theoretical content and practical activity, making them more alive and meaningful.

FIELD CLASS AND THE BIOGEOGRAPHY TEACHING

Field classes as a teaching resource are essential to building biogeographical knowledge from the effectiveness of an environment focused on research and such a construction out of the classroom. Studies on the landscape have been present since the systematization of geographic science by observing space. Thus, the field classes can combine teaching and learning in biogeography contents by analyzing the landscapes. It would make students understand the studied phenomena, creating a critical formation of their living spaces.

The field class methodology can contribute to avoiding the memorizing method of geography, enabling the effectiveness of critical and dynamic geography. According to Freire (2011, p. 67), the mechanical memorization of the object profile is not learning the

object or content. Therefore, critical school geography can foster reading of the world, helping students to understand their living spaces (BARBOSA, 2016, p. 82).

The geography teacher has the role of teaching the students the transformations present in society and their environment, making the field class a methodology that inserts the students into the space lived by the content discussed in the classroom (ARAÚJO et al. 2019, p. 273). Thus, for Sousa et al. (2016), contact with the field class environment out of the classroom allows teachers and students to develop significant geographic knowledge in the teaching and learning relationship.

Pontuschka et al. (2007) add that students need to understand the space where they live, raising questions in which the teacher will be the subject that will reveal what is behind it, from the didactic mediation of the contents exposed in the classroom and field activities. Therefore, with the field class, it is possible to awaken the student the interest in analyzing the different landscapes and relationships that exist in the location of the experience (SANTOS; BURITI, 2020, p.182), awakening the researcher's side of students.

Educators will be protagonists by promoting methodologies diverging from the common sense of education. Thus, teachers will raise interest, making students observe the environment to get information from the rock type, vegetation, weather, watercourse, and human action. It prompts critical geography when teaching the physical elements of the landscape since the teacher cannot hide information about the geographical space with the students. According to Ferreira and Souza (2019), the teacher cannot omit or diminish some of the basic guidelines of the biogeographic field.

Biogeography arises to explain the different distributions of living beings over geological time and terrestrial space (FREITAS JUNIOR, 2011). Thus, it constitutes the analysis of the environment and landscape as crucial to the construction of biogeographic knowledge, being more dynamic and meaningful from field classes. The author points out that:

[...] fieldwork in biogeography is a procedure of apprehension and analysis of the specialization of living beings in the studied environment concerning the other factors of the environment and with the elements of anthropic origin, based mainly on observation and description (empirical method) (FREITAS JUNIOR, 2011).

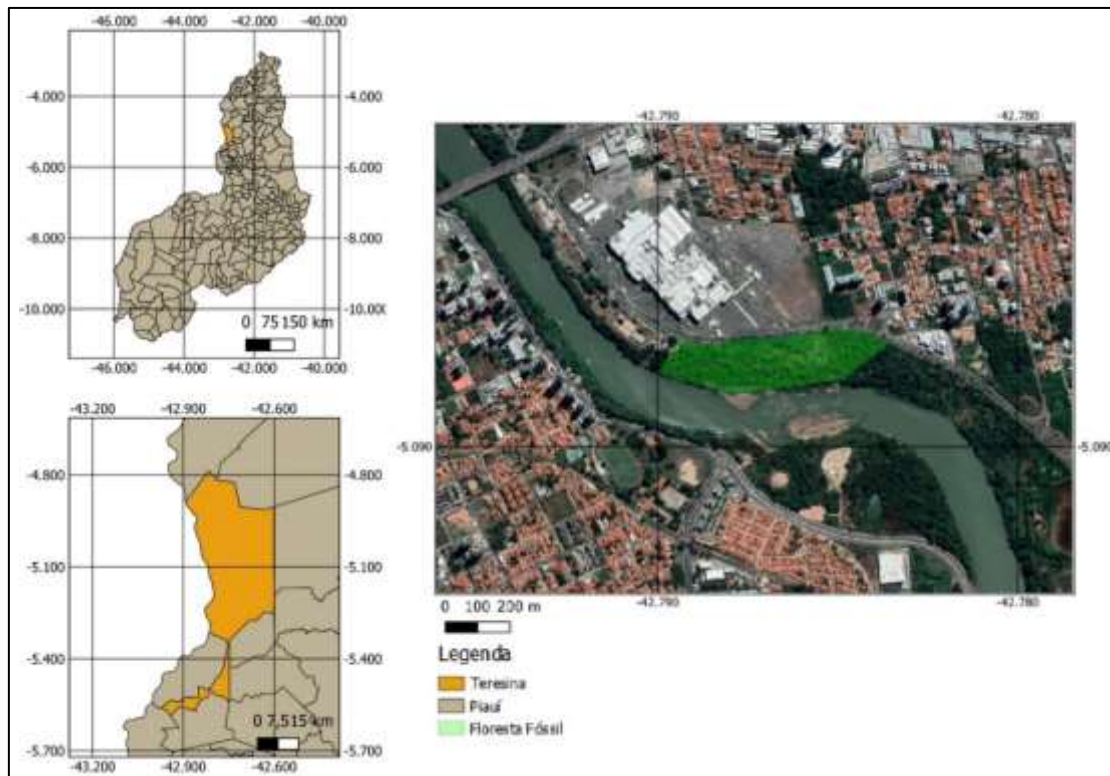
Therefore, the field class that will discuss school biogeography requires knowledge previously explained in the classroom for area recognition. What will also be essential to classroom discussions is the knowledge that students have acquired by observing the spaces. Thus, the teacher can prepare the exposure of geographic content from the information raised by students because "[...] the process of discovery in the face of any environment, whether urban or rural, can sharpen the reflection to produce knowledge that is not in textbooks" (PONTUSCHKA; PAGANELLI; CACETE, 2007, p. 173).

By being about the teaching of physical geography, the learning process can be effective from the individuality of the students due to their specificities, given that "[...] each person – according to their trajectory, consciousness, and experience – sees landscapes differently and uniquely, inserting themselves in it in a unique manner" (VERDUM et al., 2021).

CHARACTERIZATION OF THE NATURAL MONUMENT OF THE POTI RIVER FOSSIL FOREST

The Natural Monument of the Fossil Forest of the Poti River (Figure 1) is an assisting methodological tool for the construction of school biogeographic knowledge because the area refers to the "[...] reconstruction of the Piauí environmental aspects, giving clues on the vegetational evolution – such as periods, depth, sedimentation, and past climates" (LIMA, 1998, p. 2).

Figure 1 – Location map of the Fossil Forest Park in Teresina – PI



Source: IBGE (2021). Organization and Geoprocessing: Lucas Alves Pereira (2022).

The Natural Monument is a Conservation Unit (CU) by the Sistema Nacional de Unidades de Conservação (National System of Conservation Units, SNUC) of Law No. 9985 of July 18, 2000 (BRASIL, 2000, s.p.). It is worth mentioning that the Natural Monument is a "[...] category of Conservation Unit (CU) that aims to preserve the integrity of a unique natural element, of extreme rarity, or scenic beauty, such as waterfalls, rocks, and canyons" (IBRAM, 2020, s.p.). This CU is a Natural Monument by Municipal Decree No. 17,426, of January 3, 2018, which reevaluates and includes it in the category of Natural Monument becoming, then, "Natural Monument of the Poti River Fossil Forest" (TERESINA, 2018). Previously it was classified as a Municipal Environmental Park called Fossil Forest of the Poty River, created through Municipal Decree No. 2.195/1996, with an area of 13 hectares (PIAÚÍ, 2016, p. 3).

A conservation unit (CU) – according to Law No. 9985 of July 18, 2000, Art. 2 items I – is the "[...] territorial space and its environmental resources, including jurisdictional waters with relevant natural features legally established by the public power, aiming at the conservation by imposing limits under special administration with protection

guarantees" (BRASIL, 2000, s.p.). Santos (2011) mentions that the CU are natural areas that ensure the balance of the environment to maintain the conservation of fauna and flora, being a way to prohibit the occupation or appropriation of resources that belong to the site, maintaining the balance of the ecological system (SILVA et al., 2018).

The Poti River Fossil Forest Natural Monument is in the alluvial plain of the right riverbank, upstream of the Potycabana State Park and near large commercial enterprises (VASCONCELO; LIMA; MORAIS, 2016, p. 244). Still, according to the authors, this "[...] was created to preserve the paleontological remains that are outcropping in the bed and floodplain of the Poti River, in the urban area of Teresina" (VASCONCELO; LIMA; MORAIS, 2016, p. 244). According to Santos Filho (2017, p. 2)

Besides the plants that no longer exist but whose records are in the form of fossil trunks, the Fossil Forest of Teresina records traces of the ancient environment (Paleoenvironment) where these organisms lived. When the forest was alive, what existed was a humid forest environment rich in ponds. The continents were still interconnected. Instead of America, the fusion of the tectonic plates formed the great continent called Pangea.

About its natural characterization, according to Quaresma and Cisneros (2013, p. 49), the area

[...] constitutes a rare paleontological collection that holds important information that are research sources for scholars by providing data such as the landscape and climate, which had undergone modifications over time in Piauí. It is declared a patrimony of the nation, deserving special attention from authorities and visitors aware of the importance of its preservation.

Santos Filho (2017) also clarifies that the occurrence of a Fossil Forest is rare since plant fossils are less typical than the animal type for not having parts of their composition mineralized. According to this author, teeth, shells, shells, and bones have minerals in their structure. Most plants are formed by organic compounds, being easily subject to decomposition.

The fossilized trunks of the Fossil Forest date back to the Permian period of the Phanerozoic Eon by regressive cyclic sedimentation from a marine environment, being successively directed to the continent in arid climate lands (PETRI; FUIFARO apud CALDAS et al., 1989). A piece of evidence is the presence of stromatolites in the fossils, revealing the change of an aquatic environment for a terrestrial one over thousands of years.

Figure 2 shows the fossilized logs found in the Fossil Forest. They have been moved from their original position to be better viewed by the visitor, even though it is problematic from a scientific point of view.

Figure 2 – Photographs of fossilized trunk specimens from the Floresta Fossil Park in Teresina, Piauí.



Source: Pereira (2022).

The fossil records are vertical, revealing how they went through the fossilization process in their original position. They are thick in comparison to contemporarily present tree trunks. Thus, it is evident that the vegetation of that time was dense with thick trunks compared to contemporary vegetation in a hot and humid climate. In this way, it retraces a geological past showing what the Permian animals might have been like, such as insects resembling cockroaches, animals that were neither reptiles nor mammals, which belonged to the Synapsida group, and the giant flying dragonfly. In fresh waters, there were giant amphibians and, in the sea, primitive sharks, large mollusks – known as Eurypterida – and marine scorpions were abundant (CPRM, 2016).

PROPOSAL TO USE THE FOSSIL FOREST NATURAL MONUMENT AS A METHODOLOGICAL TOOL TO TEACH SCHOOL BIOGEOGRAPHY

Although there is a significant collection of fossilized plants in Piau , this object is still little studied (CONCEI AO et al., 2016). The situation stems from the process of devaluation of paleontological scientific knowledge. Thus, the teacher has a crucial role when using the scientific basis of the content, having a methodology to work on, with defined objectives and strategies to assist the learning process.

Field classes are not only activities that involve learning in the outdoors or a touristic walk. On the contrary, the scientific and research view requires stimulation, so students get the most out of the content. Therefore, it is necessary to have

[...] the care not to fall into a casual observation is redundant in common-sense activities. After all, taking students to the field is only one of the steps of the work because the goal is to debate the reasons for doing the work and contribute to setting the elements for survey and measurement (MARTINEZ; LEME, 2007, p.2).

Thus, the field classes need a theoretical and methodological rigor as any other lesson aimed at traditional classroom teaching, as well as ensuring that they can contribute to

meaningful learning for students. It is worth emphasizing the necessity of ensuring the safety of the participants.

The teacher must dialogue with the students to meet the proposed objectives for this type of class through socialization, approaching different looks regarding the object of study, and helping the critical and reflective side of the students. It is necessary to raise challenges for students when facing problems in the field class space so that, through dialogues and information exchange, they advance intellectually about the objects of knowledge in the field (BRAUN, 2007, p. 254). Thus, they will be able to specify and punctuate elements that permeate the Fossil Forest, its object of study, and its problems.

Besides methodological planning, field classes are not only gathering students in a specific space. These activities need to consider the logistics, time, food, permanence time, and other factors (CARDOSO; SILVA, 2018, p. 171). For Rodrigues and Otaviano (2001), it is necessary for preparation and criteria to carry out such activities, even if there are no defined norms. However, it is fundamental of a start to help in good planning. The authors point out that the "[...] three fundamental and indispensable moments are preparation, execution, and results or evaluation" (RODRIGUES; OTAVIANO, 2001, p. 37).

Based on Rodrigues and Otaviano (2001) concerning the stages of a field class, Table 2 exemplifies geography teachers can plan field classes in the Poti River Fossil Forest Natural Monument.

Table 2 – Suggested field use in the Fossil Forest

STAGES	DESCRIPTION
Preparation (before the field class)	1. Recognize where the field lesson will take place: the teacher must recognize the space in terms of safety and whether it can hold an adequate number of students.
	2. Contact tour guides and the agency responsible for the Natural Monument administration to assist in the field class.
	3. Define the itinerary for the field class: draw up an itinerary with the tour guide for better use of the space and visualization of the fossils, and define stopping points to explain the content.
	4. Outline objectives concerning the field class in the Fossil Forest, such as the identification and importance of fossils and the contextualization of local biogeographic elements.
	5. Conduct an expository and dialogued class in the classroom: the teacher should socialize with the students what is the Fossil Forest and its characteristics. In the lessons, there must be contextualization of analyzed biogeographical themes and their relevance in the Fossil Forest aspects. For instance, the continental drift theory, morphoclimatic domains, or geological eras.
	6. Apply a field sheet prepared by the teacher so students can identify the characteristics of the environment: location data (latitude and longitude); geology (lithostratigraphic units); relief (topography, altitude, and slope); hydrography (watershed, rivers); climate (prevailing weather, weather variation); soils (soil types); vegetation (type, primary or secondary); land use (planting, animal husbandry or minerals) (LIMA, 2021).
Performance (field class)	1. Welcome students, present the behavior rules expected in the activities, and explanation of the approached contents (CAMPELO, 2021, p. 12).
	2. Stimulate the interest of students through curiosity.
	3. Follow concisely the objectives proposed in the pre-field.
	4. Guide the information gathering in the field form prepared before the field class.

	5. Alert students to gather all types of biogeographic elements in the field by taking notes.
	6. Guide them to record these elements through photographs.
After field class (results/evaluation)	1. Address affectionately in the first contact back to the classroom what they thought of the field class, highlighting what was most important to each student (PONTUSCHKA et al., 2007).
	2. Discuss what the students were able to record in the Natural Monument, enabling an exchange of information among them. According to Pontuschka et al. (2007, p. 186), "[...] the knowledge, now enriched by the various experiences and knowledge gained in the field, meet in the classroom.
	3. Indicate issues that prompt debate among students.
	Essential questions to ask: How did fossils come about? Why are fossils so important? Why are there fossils in the state of Piauí? Why should we preserve the Fossil Forest? What biogeographic elements are present in the field?
	4. Conduct conversation circles: this is a way to evaluate without the formality of a written evaluation. However, it can happen in a way that addresses the students' tastes: a photo essay, a text, a video, or a sketch representation. Cognition comes in as the fundamental guideline of the whole field class process. Thus, teachers must freely choose which evaluation procedure is the most appropriate for the class.

Source: Organized by the author (2022).

The field class can be essential in the teaching-learning process of school biogeography contents as it will allow the understanding of the elements present in the landscape. It should follow an integrated analysis of physical and human components and local relationships, aiming to understand the potential of natural resources and the rich biogeographical and paleontological heritage in such a conservation unit.

CONCLUSION

Developing this article cleared the understanding of school programs concerning the teaching of biogeography, emphasizing skills and contents from the BNCC. The research showed that, in elementary education, constructing biogeographic knowledge can happen through a non-innovative methodology that can contribute to meaningful learning.

The Natural Monument of the Fossil Forest of the Poti River can be a useful methodological tool for the realization of field classes, aiming to develop biogeographical knowledge. The fossil records in that conservation unit can contribute to discussions about various physical geography issues. The site can serve educational purposes despite its abandonment.

However, although methodology and space contribute to facilitating the transmission of biogeographic knowledge, there are several procedures to be taken by teachers and students to not deviate from the proposed objectives for the field class. The study aimed to indicate how elementary education teachers can plan field classes in open environments.

Biogeographical studies carried out through field classes in local green areas, such as the Natural Monument of the Fossil Forest of Poti River, can give visibility to this

paleontological heritage and discussions on the preservation and conservation necessity. These practices will enable students to learn in a meaningful way, contributing to the understanding of their role as citizens.

By conducting practical field classes on the teaching of physical geography contents in the Natural Monument of the Fossil Forest of the Poti River, it is possible to provide a more meaningful learning process for the students and raise awareness about the preservation and conservation of this conservation unit.

REFERENCES

ARAÚJO, Alda Cristina de Ananias; PEREIRA, Lucas Alves; ALBUQUERQUER, Emanuel Lindemberg Silva. Cidade educadora e ensino de Geografia: o Parque Lagoas do Norte- Teresina/PI em destaque. *In: SEMINÁRIO NACIONAL DE ENSINO E PESQUISA DO CURSO DE LICENCIATURA EM GEOGRAFIA DA UFPI, 1.; REUNIÃO ITINERANTE DO NÚCLEO DE ENSINO E PESQUISA EM EDUCAÇÃO GEOGRÁFICA – NEPEG, 1., Teresina- PI, EDUFPI, 2019. Teresina, PI. Anais [...]. Teresina, 2019, p. 273- 347. Disponível em:*

https://sigaa.ufpi.br/sigaa/public/curso/documentos.jsf?lc=pt_BR&id=74208. Acesso em: 2 abr. 2022.

BARBOSA, Maria Edivani Silva. A Geografia na Escola: Espaço, Tempo e Possibilidades. **Revista de Ensino de Geografia**, Uberlândia, v. 7, n. 12, p. 82-113, jan./jun. 2016.

BRANCO, Emerso Pereira; BRANCO, Alessandra Batista de Godoi; IWASSE, Lilian Fávoro Alegrâncio; ZANATTA, Shalimar Calegari. Uma Visão Crítica Sobre a Implantação da Base Nacional Comum Curricular em Consonância Com a Reforma do Ensino Médio. **Debates em Educação**, 2018.

BRAUN, Ani Maria Swarowsky. Rompendo os muros da sala de aula: o trabalho de campo na aprendizagem de geografia. **Ágora**, Santa Cruz do Sul, v. 13, n. 1, jan./jun. 2007, p. 250- 272.

CALDAS; Eva Batista; MUSSA, Diana; LIMA FILHO, Francisco Pinheiro; RÖSLER, Oscar. Nota sobre a ocorrência de uma floresta petrificada de idade permiana em Teresina, Piauí. **Boletim IG-USP**, Publicação Especial, n. 7, 1989.

CAMPOS, Aline Mello. Ressignificar o ensino de biogeografia na educação básica através da práxis. *In: ENCONTRO NACIONAL DE PRÁTICA DE ENSINO DE GEOGRAFIA, 14., 2019. Campinas, SP, Anais [...]. Campinas, São Paulo, 2019, p. 1666-1677. Disponível em:*
<http://ocs.ige.unicamp.br/ojs/anais14enpeg/article/view/3002/2866>. Acesso em: 8 abr. 2022.

CARDOSO, Cristiane; SILVA, Michele Souza da. **A Geografia Física: teoria e prática no ensino de Geografia**. 1. ed. Curitiba: Appris, 2018.

COMPANHIA DE PESQUISA E RECURSOS MINERAIS - CPRM. **Breve História da Terra**, 2016. Disponível em: <http://www.cprm.gov.br/publique/SGB-Divulga/Canal-Escola/Breve-Historia-da-Terra-1094.html?tpl=printerview>. Acesso em: 7 abr. 2022.

CONCEIÇÃO, Domingas Maria; CISNEROS, Juan Carlos; IANNUZZI, Roberto. Novo registro de floresta petrificada em Altos, Piauí: relevância e estratégias para geoconservação. **Pesquisas em Geociências**, [S. l.], v. 43, n. 3, p. 311–324, 2016. DOI: 10.22456/1807-9806.78242. Disponível em: <https://seer.ufrgs.br/index.php/PesquisasemGeociencias/article/view/78242>. Acesso em: 10 abr. 2022.

BRASIL. Lei nº 9.985, de 18 de julho de 2000. Regulamenta o art. 225, § 1o, incisos I, II, III e VII da Constituição Federal, institui o Sistema Nacional de Unidades de Conservação da Natureza e dá outras providências. **Diário Oficial [da] República Federativa do Brasil**, Brasília, DF: Congresso. Senado, 18 jul. 2000.

BRASIL. Ministério da Educação e Cultura. **Base Nacional Comum Curricular: Educação Infantil e Ensino Fundamental**, 2017. Disponível em: <http://basenacionalcomum.mec.gov.br/wp-content/uploads/2018/02/bncc-20dez-site.pdf>. Acesso em: 19 abr. 2022.

FERREIRA, João Victor Silva; SOUZA, Raquel de; Interdisciplinaridade e Biogeografia: Por que não? *In*: CONGRESSO NACIONAL DE PESQUISA E ENSINO EM CIÊNCIAS, 4., 2019. [S.l.]. **Anais eletrônicos**. [...]. [S.l.], 2019. Disponível em: <https://editorarealize.com.br/artigo/visualizar/5693>. Acesso em: 29 abr. 2022.

FREIRE, Paulo. **Pedagogia da autonomia: saberes necessários à prática educativa**. 43. ed. São Paulo: Paz e Terra, 2011.

FREIRE, Paulo. **Pedagogia do oprimido**, 17. ed. Rio de Janeiro, Paz e Terra, 1987

FREITAS JUNIOR, Gerson de. O trabalho de campo em biogeografia - Homenagem ao Prof. Dr. Felisberto Cavaleiro (1945-2003). **Confins** [Online], v.12, 2011, 2011. Disponível em: <http://confins.revues.org/7164>. Acesso em: 03 out. 2021.

FIGUEIRÓ, Adriano S. **Biogeografia: dinâmicas e transformações da natureza**. São Paulo: Oficina de Textos, 2015.

FURLAN, Sueli Angelo; SOUZA, Rosemeri Melo e; LIMA, Eduardo Rodrigues Viana de; SOUZA, Bartolomeu Israel de Souza. Biogeografia: Reflexões Sobre Temas e Conceitos. **Revista da Associação Nacional de Pós-graduação e Pesquisa em Geografia (Anpege)**, v.12, n.18, Especial GT Anpege, p. 97-115, 2016.

INSTITUTO BRASILEIRO DE MINERAÇÃO – IBRAM. **O que é um monumento Natural?** 2020. Disponível em: <https://www.ibram.df.gov.br/o-que-e-um-monumento-natural/#:~:text=Monumento%20Natural%20%C3%A9%20a%20categoria,%2C%20cachoeira%2C%20rochas%20e%20c%C3%A2nion>. Acesso em: 13 abr. 2022.

LIMA, Iracilde Maria de Moura Fé. Fósseis da fauna e flora formam floresta petrificada do Poti. **Jornal Meio Norte**, Teresina, p. 5, 16 ago. 1998.

LIMA, Eric de melo. Aulas de campo de Geografia com auxílio de aplicativos gratuitos. *In: Curso de Extensão: Aprendizagem significativa com o uso de recursos didáticos não convencionais no ensino de Geografia.* **Youtube**, 2021. Disponível em: <https://www.youtube.com/watch?v=miMGJzh1eH0>. Acesso em: 06 abr. 2022.

MARTINEZ, Adilson; LEME, Ricardo Carvalho. **O trabalho de campo como metodologia de ensino de Geografia: o Estudo de Caso da Vila Malvina – Guaíra/PR.** Guaíra, Paraná, 2007, p. 1-27. Disponível em: http://www.gestaoescolar.diaadia.pr.gov.br/arquivos/File/producoes_pde/artigo_adilson_martinez.pdf. Acesso em: 03 out. 2021.

MORAIS, Eliana Marta Barbosa de. **O Ensino das Temáticas Físico-Naturais na Geografia Escolar.** Orientadora: Profa. Dra. Sonia Maria Vanzella Castellar. 2011. Tese (Doutorado em Geografia) – Universidade de São Paulo, São Paulo, 2011.

NUNES, Patrícia Barbosa; SANTOS, Bruno Alves dos; MATOS, Angélica Azevedo de. Aula de Campo e o Ensino de Geografia: metodologia aplicada na turma de 9º ano da EMEF Princesa do Xingu na cidade de Altamira-PA. *In: ENCONTRO NACIONAL DE GEÓGRAFOS*, 18., 2016. São Luís, MA, **Anais [...]**. São Luís, MA, [s.n], 2016.

PEREIRA, Lucas Alves. **2 fotografias color. digitais**, Teresina, 2022.

PIAUI. Ministério Público do Estado do Piauí. Núcleo de Defesa do Meio Ambiente. **Ação Civil Pública por danos causados ao Meio Ambiente**, 2016. Disponível em: <https://www.mppi.mp.br/internet/wp-content/uploads//2017/09/acp%20-%20floresta%20fossil.pdf>. Acesso em: 29 abr. 2022.

PONTUSCHKA, Nídia Nacib; PAGANELLI, Tomoko Iyda; CACETE, Núria Hanglei. **Para ensinar e aprender Geografia.** São Paulo: Cortez, 2007.

QUARESMA, Renata Larissa Sales; CISNEROS, Juan Carlos. O Parque Floresta Fóssil do Rio Poti como ferramenta para o ensino de paleontologia e educação ambiental. **Terrae (Online)**, v. 10, p. 47-47, 2013.

RODRIGUES. Antonia Brito; OTAVIANO, Claudia Arcanjo. **Guia Metodológico de Trabalho de Campo em Geografia.** **Geografia**, Londrina, v. 10, n. 1, p. 35-43, jan./jun. 2001.

SANTOS FILHO, Francisco S. Como a Floresta Fóssil se formou? **Revista Cidade Verde.com**, 2017. Disponível em: <https://www.cidadeverde.com/cienciaviva>. Acesso em: 8 jan. 2022.

SANTOS, Anderson Alves. Parques Nacionais Brasileiros: relação entre Planos de Manejo e atividade ecoturística. **Revista Brasileira de Ecoturismo**, São Paulo, v.4, n.1, p. 141-162, 2011.

SANTOS, Anderson Felipe Leite dos; BURITI, Maria Marta dos Santos. A importância da aula de campo no processo de ensino e aprendizagem de Geografia. **GeoUECE** (online), v. 9, n. 16, p.181-194, 2020.

SILVA, Michael Souza; ALMEIDA, Pâmela Martimiano Pereira Ruy de; GUERRA, Theodoro. A conservação e o uso sustentável de unidades de conservação em Juiz de Fora -MG: estudo de caso parque natural municipal da Lajinha, mediante a implementação do icms ecológico. **Jornal Eletrônico Faculdades Integradas Vianna Júnior**, [S. l.], v. 10, n. 1, p. 19, 2018. Disponível em: <https://www.jornaleletronicofivj.com.br/jefvj/article/view/9>. Acesso em: 12 abr. 2022.

SILVA JUNIOR, Ivan de Matos e; ARAÚJO, Davi Santos; NASCIMENTO, Odicleide Coutinho do. A biogeografia na geografia escolar: Uma reflexão a partir de livros didáticos de ensino médio. In: ENCONTRO INTERNACIONAL DE FORMAÇÃO DE PROFESSORES, 12., 2016, Salvador, **Anais [...]**. Salvador, BA: [S.n.], 2016.

SILVA, Michael Souza; ALMEIDA, Pâmela Martimiano Pereira Ruy de; GUERRA, Theodoro. A Conservação e o Uso Sustentável de Unidades de Conservação em Juiz de Fora – MG: Estudo de caso parque natural municipal da Lajinha, mediante a implementação do ICMS ecológico. **Jornal Eletrônico Faculdades Integradas Vianna Júnior**, [S.l.], v. 10, n. 1, p. 19, 2019. Disponível em: <https://www.jornaleletronicofivj.com.br/jefvj/article/view/9>. Acesso em: 9 abr. 2022.

SOUSA, Cristiane Aureliano de. MEDEIROS, Monalisa Cristina Silva. SILVA, José Adailton Lima. CABRAL, Laíse Nascimento. A aula de campo como instrumento facilitador da aprendizagem em Geografia no Ensino Fundamental. **Canal CECIERJ**, [S.l.;S.n], 2016. Disponível em: <https://canal.cecierj.edu.br/recurso/16746>. Acesso em: 14 abr. 2022.

TERESINA, Prefeitura Municipal de. Decreto Municipal Nº 17.426, de 03 de janeiro de 2018, que reavalia a categoria do “Parque Municipal Floresta Fóssil do Rio Poti”. **Diário Oficial do Município**, Teresina: PMT, 2018.

VASCONCELOS, Marcela Vitória; MORAES, Maria Valdirene Araujo Rocha; LIMA, Iracilde Maria de Moura Fé. Floresta fóssil do rio Poti em Teresina, Piauí: porque não preservar? **Revista Equador (UFPI)**, Teresina, v. 5, n. 3, 2016.

VERDUM, Roberto; VIEIRA, Lucimar de Fátima dos Santos; SILVA, Luís Alberto Pires da; GASS, Sidnei Luís Bohn (org.). **Paisagem: leituras, significados, transformações**. Porto Alegre: Editora Letra1, 2021. (v. 2).