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ENVIRONMENTAL EDUCATION IN PERSPECTIVE: FIELD CLASS AS A PEDAGOGICAL TOOL IN TEACHING ECOLOGY AND THE ENVIRONMENT: A DIDACTIC PROPOSAL INTEGRATED WITH THE BNCC

EDUCAÇÃO AMBIENTAL EM PERSPECTIVA AULA DE CAMPO COMO FERRAMENTA PEDAGÓGICA NO ENSINO DE ECOLOGIA E MEIO AMBIENTE UMA PROPOSTA DIDÁTICA INTEGRADA À BNCC

EDUCACIÓN AMBIENTAL EN PERSPECTIVA: LA CLASE DE CAMPO COMO HERRAMIENTA PEDAGÓGICA EN LA ENSEÑANZA DE LA ECOLOGÍA Y EL MEDIO AMBIENTE: UNA PROPUESTA DIDÁCTICA INTEGRADA CON LA BNCC

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ABSTRACT

This work proposes to promote learning about ecology, biodiversity, soil formation and use, the importance of aerial rivers and carbon sequestration, mechanisms for reducing global temperature rise, and environmental preservation through ecological trails in an area of extreme environmental importance in the municipality of Vila Velha, in the Lagoa Encantada Permanent Preservation Area (APP Lagoa Encantada), thus connecting theory and practice in a meaningful way. This involved conducting a field trip in an area of extreme environmental importance in the municipality of Vila Velha. Pre- and post-field activities were conducted to consolidate the acquired knowledge, encourage critical reflection on environmental conservation among 6th and 7th grade elementary school students, and finally, create a pedagogical activity plan that can be replicated in other schools in the region. During practical activities on the ecological trails, students apply the concepts, observing and recording local fauna and flora, analyzing food chains, and assessing the region's environmental impacts. After the field activities, supplementary activities were held, such as a field lesson report and questionnaire, discussion groups, and other activities. Students were able to develop various skills and abilities from the National Common Curriculum Base (BNCC).

Keywords: Field Lesson. Non-formal Education Space. Environmental Awareness.

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RESUMO
O trabalho propõe a promoção do aprendizado sobre ecologia, biodiversidade, formação e uso do solo, importância dos rios aéreos e sequestro de carbono, mecanismo de redução do aumento da temperatura global e preservação ambiental por meio de trilhas ecológicas em uma área de extrema relevância ambiente no município de Vila Velha na Área de Preservação Permanente Lagoa Encantada (APP Lagoa Encantada), conectando assim, teoria e prática de maneira significativa. Com isso, foi realizado uma aula de campo em uma área de extrema importância ambiental no município de Vila Velha, atividades pré e pós-campo para consolidar os conhecimentos adquiridos, incentivar a reflexões críticas sobre a conservação ambiental para alunos do 6° e 7° ano do ensino do ensino fundamental e por fim, criar um roteiro de atividades pedagógicas replicável em outras escolas da região. Durante as atividades práticas nas trilhas ecológicas, os alunos aplicam os conceitos, observando e registrando a fauna e flora locais, analisando cadeias alimentares e avaliando impactos ambientais da região. Após as atividades de campo, foram realizadas atividades complementares, como relatório de aula de campo e questionário, roda de conversa entre outras atividades. Os alunos puderam desenvolver diversas competências e habilidades da Base Nacional de Currículo Comum (BNCC).

Palavras-chave: Aula de Campo. Espaço Não-formal de Educação. Sensibilidade Ambiental.

RESUMEN
Este trabajo propone promover el aprendizaje sobre ecología, biodiversidad, formación y uso del suelo, la importancia de los ríos aéreos y el secuestro de carbono, los mecanismos para reducir el aumento de la temperatura global y la preservación del medio ambiente mediante senderos ecológicos en una zona de extrema importancia ambiental en el municipio de Vila Velha, dentro del Área de Preservación Permanente Lagoa Encantada (APP Lagoa Encantada), conectando así la teoría y la práctica de forma significativa. Esto implicó la realización de una salida de campo en una zona de extrema importancia ambiental en el municipio de Vila Velha. Se realizaron actividades previas y posteriores a la salida de campo para consolidar los conocimientos adquiridos, fomentar la reflexión crítica sobre la conservación ambiental entre los estudiantes de 6.º y 7.º grado de primaria y, finalmente, crear un plan de actividades pedagógicas que pueda replicarse en otras escuelas de la región. Durante las actividades prácticas en los senderos ecológicos, los estudiantes aplican los conceptos mediante la observación y el registro de la fauna y la flora locales, el análisis de las cadenas tróficas y la evaluación de los impactos ambientales de la región. Tras las actividades de campo, se realizaron actividades complementarias, como un informe de la lección de campo y un cuestionario, grupos de discusión y otras actividades. Los estudiantes pudieron desarrollar diversas habilidades y destrezas gracias a la Base Curricular Nacional Común (BNCC).

Palabras clave: Clases Prácticas. Espacio de Educación no Formal. Conciencia Ambiental.

1 INTRODUCTION

Environmental education plays a crucial role in training individuals who are aware and prepared to face contemporary environmental challenges. This work proposes the creation of a pedagogical itinerary for ecological trails in the Lagoa Encantada Permanent Preservation Area (APP), located in Vila Velha/ES and shelters the source of the Aribiri River, which is a fragment of mangrove that resisted the disorderly occupation of the region. Its surroundings are composed of an ecological mosaic that includes species of restinga, open forest and flooded areas, as well as the Morro do Carcará, which preserves fragments of Atlantic Forest and the Mirante dos Cactus that presents as rock phytophysiognomy especially the cacti (tasty) and selaginella. As part of this proposal, a field class will be held, aimed at students from the 7th grade Year of the Teaching Fundamental,

which will integrate interdisciplinary activities of environmental observation, species identification, analysis of environmental impacts and critical reflection on the importance of conservation, promoting a meaningful educational experience connected with the local ecological reality.

This initiative also intends to combine the theoretical contents provided for in the National Common Curricular Base (BNCC) with field practice, contributing to the development of skills and abilities such as critical thinking, teamwork and the recognition of the interdependence between living beings and the environment (CAMPOS, SILVA, 2015. p. 17; BARATA, GONÇALVES, 2015. p. 141).

In this context, several skills of the BNCC will be mobilized. Initially, students will be encouraged to identify the main Brazilian ecosystems, understanding their characteristics in terms of landscape, water, soil, light and temperature, correlating these factors with the local fauna and flora, as provided for in EF07CI07. This analysis will be done directly on the trails of the visited area, where students will be able to observe the predominant vegetation, the type of soil, the incidence of sunlight and the behavior of different species, connecting theory and practice. The proposal also includes the EF07CI08 skill, which deals with the assessment of environmental impacts on the populations of living beings, analyzing how human actions, such as deforestation, pollution and disorderly land occupation, affect habitats, put species at risk and alter their natural behaviors. This reflection will be addressed during the trail, where environmental impacts can be observed *in loco* and discussed based on real and local data.

The approach to natural phenomena such as volcanoes and earthquakes, although rare in Brazil, will be done in the light of EF07CI15's skill, which guides the investigation of these events based on the tectonic plate model. Students will be encouraged to understand

why these phenomena are uncommon in the Brazilian territory and how the geological position of the country influences this reality, while reinforcing their knowledge of the structure of the planet.

For this, the EF06CI11 skill will be resumed, which addresses the analysis of the different layers of the Earth. Students will understand how the lithosphere, asthenosphere and other layers influence the occurrence of geological phenomena, creating an expanded understanding of terrestrial dynamics, essential to understand natural processes on a global scale.

Still in the field of physical and human geography, the EF06GE11 skill will be incorporated, allowing students to analyze the interactions between societies and nature, considering the physical-natural components and their transformations over time. Issues such as human occupation, degradation of green areas and transformations of biodiversity in both local and global space will be discussed.

The greenhouse effect, an urgent and transversal theme, will be addressed from the EF07CI13 skill, which provides for the description of the natural mechanism of the greenhouse effect and its impacts when intensified by human actions. In the field, students will be able to observe practices such as fires or deforestation and discuss how these actions contribute to global warming and climate change, in addition to reflecting on sustainable alternatives.

During the course, the EF06CI10 skill will also be worked on, focusing on the identification of sedimentary rocks, the formation of fossils and the action of weathering on the soil, enabling the direct observation of geological materials, their composition and the role of weather and climate action on the natural environment.

The correlation between climate, soil, relief and vegetation will be explored based on EF06GE05 ability, allowing an integrated reading of the landscape and the understanding of the factors that shape ecosystems and influence human occupation. This integrated view is essential to understand the environmental balance and the risks associated with its rupture.

The proposal is also in line with the EF07GE07 skill, which proposes the analysis of land occupation and population dynamics, observing how urban growth affects natural areas, contributes to the increase in pollution and affects the quality of life of the population. Students will be able to observe how previously preserved areas today face processes of urbanization or degradation.

In addition, the preservation of the ozone layer, addressed by the ability EF07CI14, will be addressed in the final discussions, relating the emission of certain pollutants to the

degradation of this protective layer of the Earth. Individual and collective proposals for its preservation will be worked on, stimulating conscious citizen action.

Finally, the skill EF06GE13 will allow students to analyze the consequences of human practices on climate dynamics, such as the phenomenon of heat islands, noticeable in the temperature differences between urbanized and vegetated areas. This analysis will be based on temperature measurement, environmental perception and group debate.

The use of non-formal spaces of education, such as ecological trails, has proven to be an effective tool for the teaching of science and biology, as highlighted by education theorists such as Dewey (1971), who defended learning through direct experience, and Freire (1987), who emphasized the importance of critical reflection in the relationship of the individual with the world. This approach promotes a more meaningful connection between students and the contents worked, expanding the understanding of the interdependence of living beings and their relationship with the environment.

Parks, reserves, environmental centers, museums and other environments outside the traditional school space is a pedagogical strategy that enhances the learning process by promoting practical, interactive and contextualized experiences, facilitating the connection between theory and practice and thus contributing to the development of students' cognitive skills and critical skills.

The ecological trails at the Lagoa Encantada APP offer unique opportunities to integrate theory and practice, highlighting the advances that the use of non-formal spaces can bring to teaching-learning. Through these experiences, students experience in practice the concepts of ecology, biodiversity and environmental conservation, making learning more dynamic and engaging.

2 BACKGROUND

Environmental degradation and ecological crises demand the formation of citizens capable of adopting conscious and sustainable attitudes. In this context, environmental education emerges as an essential tool to prepare individuals to face contemporary environmental challenges. This proposal seeks to awaken in students from the municipal network of Vila Velha a critical and participatory look, aligning with the BNCC, specifically in the area of Natural Sciences and its technologies. The integration between these elements will enable students to understand ecological relationships and the importance of environmental conservation more broadly.

3 PROBLEM

How to effectively integrate environmental education into elementary school through ecological trails, promoting students' awareness of the importance of biodiversity and environmental preservation?

4 OBJECTIVE

4.1 GENERAL OBJECTIVE

Promote interdisciplinary learning about ecology, biodiversity and environmental preservation through ecological trails at the Lagoa Encantada APP, connecting theory and practice in a meaningful way.

4.2 SPECIFIC OBJECTIVE

1. Conduct field classes that connect students to local biodiversity.
2. Develop pre- and post-field activities to consolidate the knowledge acquired.
3. Encourage critical reflections on environmental conservation and its relationship to global and local ecological crises.
4. Work interdisciplinary with ecological themes for each school year.
5. Create a script of pedagogical activities replicable in other schools in the region, considering the uniqueness of the Lagoa Encantada APP.

5 THEORETICAL FRAMEWORK

Education in non-formal education spaces helps in the teaching-learning process by not conditioning the student in the traditional school environment and allowing practical experience to be consolidated with theories. Field classes are an opportunity for students to interact with the environment around them, promoting active learning full of experiences and practices that helped students develop critical and reflective skills, essential for democratic life, which for Dewey (1971. p. 19) education is a continuous process of rebuilding experiences and promoting equality and social participation.

For Souza *et al* (2016, p. 3), field classes refer to a didactic methodology that involves direct observation and research in real environments, allowing students to relate theory to practice, facilitating the understanding of the phenomena of the space studied. This strategy promotes an interdisciplinary approach, valuing the study of the environment and encouraging the development of the investigative character of students. As for the form of application:

> [...] field classes can take place in different spaces, such as cities, natural areas, historical sites, or parks, and are carefully planned before, during, and after the

> activity. They may involve guided tours, data collection, debates, use of audiovisual resources and analysis of environmental or social problems, always articulating theory and practice. (SOUSA, *et al*, 2016. p. 03)

For Freire (1971. p. 44) education must occur in contexts that go beyond the traditional classroom and dialogue is essential for the construction of a liberating education, arguing that it must be mediated by the world and by the reality experienced by the students, promoting a rich and transformative interaction between educators and students.

Campo and Silva (2015) define non-formal education space as [...] *any space outside the school walls, in which it is possible to develop a pedagogical practice* [...] (p.17) and associated with the idea of democratization of education based on the acquisition of knowledge through the different experiences also obtained by field classes (DEWEY, 1971).

The information contained in these environments favors the emergence of knowledge built in formal spaces of education through practical and contextualized experience, enriched by theoretical scientific concepts and thus, the student directly observes the phenomena known until then in the theoretical, providing critical thinking and autonomy (CAMPO, SILVA, 2015. p. 17-20)

6 METHODOLOGICAL PROCEDURES

The effective integration of environmental education into Elementary School through ecological trails should involve a planned, participatory and contextualized approach, which stimulates students' awareness of the importance of biodiversity and environmental preservation. For this, it is essential to follow some strategies based on the content of the work: The work was carried out in 2024 in a public school in the municipality of Vila Velha/ES with students from the 7th grade of elementary school in the final years in the regular education modality and the activities were developed in four stages detailed below:

6.1 PLANNING

6.1.1 Pre-field

Scripts were prepared that contemplated concepts of ecology, biodiversity, sustainability and environmental preservation, aligning them with the learning objectives and the activities of observation and reflection. The preparation also includes the collection of didactic resources, such as species identification sheets, maps, photos and registration materials, snacks and authorization signed by the student's guardian.

6.1.2 Field

During the trail, students were encouraged to directly observe the natural environment, identify species of plants, animals and ecosystem components, as well as environmental impacts and crime and relate these observations to theoretical concepts learned in the classroom. The incentive was through questions that stimulate reflection on the importance of biodiversity and the impacts of human actions, pointing out some characteristic that was important for learning or verifying something that had already been identified.

6.1.3 Post-field

Evaluations and continuity were carried out, initially analyzing the samples collected (written and photographed records), the biodiversity, the levels of organization of the living beings in the place and the sensitive points and environmental impact and the origin of these impacts (e.g. Natural or anthological) were discussed, and the elaboration of activities such as texts, drawings and photography of the landscape of the place, posters/slide and workshops providing actions that collaborate with strengthening the emotional bond and critical understanding of the theme.

6.1.4 Questionnaire

To assess the effectiveness and perception of students in relation to activities carried out in non-formal educational spaces, such as field classes or ecological trails, a questionnaire proposal should include questions that explore aspects of learning, interest, environmental perception and theory-practice relationship.

The use of a questionnaire allows the identification of strengths and areas for improvement in activities in non-formal spaces, contributing to improve future pedagogical actions and strengthening the relationship between theory and practice in teaching-learning.

7 PRESENTATION AND DISCUSSION OF RESULTS

The groups formed by the students noticed and pointed out that at all points observed, there was solid waste of anthropological origin, and at the first point at the entrance of the Lagoa Encantada APP in the Jardim do Vale neighborhood, the largest amount of waste outside of domestic origin (plastics, disposables, bottles and clothes), civil construction (rubble, wood and bags of expired cement), others of diverse origin besides the one that comes from the neighborhood with the wind. Another point to be highlighted was erosion

resulting from clandestine sand extraction that can also be seen at various points on the trail.

Two other points of environmental degradation observed was the irregular creation and widening of the track for motocross, because with the creation/enlargement associated with the noise and the occupation of feeding, nesting and resting areas of animals, it ends up scaring away mainly migratory birds.

The three main lagoons visited all had some type of waste such as plastics, PET bottles, styrofoam, among others. In addition, the upwelling of aquatic macrophytes suggests contamination by allochthonous organic matter.

7.1 QUESTIONNAIRE RESULT

The result of the questionnaire varied according to the experience and perception of the students involved in the activity in non-formal educational spaces. In general, it is observed that students positively value outdoor and outdoor activities, highlighting that these experiences facilitate the understanding of the contents covered in the classroom, increase interest in the discipline of ecology, biodiversity and environment and promote greater environmental awareness.

Specifically, typical outcomes include:

- A majority of students classified the experience as positive or very positive, indicating a high degree of satisfaction.
- A large proportion reported that they were able to relate the theoretical content with the practice observed in the activity.
- The perception that outdoor activities make learning more interesting, relevant, and unforgettable.
- Consensus fromthan Resourceshow Debates Records Written, photographic, and video contribute to engagement and understanding.
- Most of them recognized the importance of these activities for learning and the formation of a critical and citizen posture.

On the other hand, some students may point out the need for improvements, such as greater organization, more resources or more dynamic activities to further enhance these moments of learning outside the classroom.

In short, the result of the questionnaire usually indicates that activities in non-formal spaces have a positive impact on the learning of ecology, biodiversity and the environment, contributing to a more effective, contextualized and participatory understanding, in addition to fostering aspects of citizenship and sustainability, as highlighted in the document.

8 FINAL CONSIDERATIONS

The study highlighted that the field class is a fundamental methodological strategy for teaching ecology, biodiversity and the environment, enabling students to integrate theory and practice, in addition to promoting more meaningful and critical learning. The study demonstrates that field activities help to arouse students' interest in the discipline, combating the view that natural science is a subject that is only unnecessary to deal with the problems faced in the world. They also contribute to students being able to identify, feel and understand in practice the content learned in the classroom, strengthening their relationship with space and nature.

In addition, the observations indicate that the field class not only benefits the students, but also broadens the perception of teachers about the feasibility and importance of this strategy. However, it is known that field classes need to be incorporated in a continuous and planned way in the teaching process, recognizing their potential to transform learning, promote environmental reflection and develop complex cognitive skills.

Finally, the study concludes that fieldwork is an indispensable tool for understanding natural science and other sciences that seek to train students capable of thinking, reflecting and acting critically in relation to space and the environment, contributing to the formation of more conscious and active citizens in society.

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