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Environmental Education Activities in non-formal spaces: fostering conceptual Biology learning[1]

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ABSTRACT

This study investigated how Environmental Education activities, developed in Non-Formal Teaching Spaces, can contribute to the learning of conceptual content by high school students. To this end, a diagnostic questionnaire was initially applied to identify the students' prior knowledge. Subsequently, educational visits and activities were carried out at two sites located in the municipality of Ibatiba, Espírito Santo, with the aim of stimulating critical thinking and promoting the connection between school curriculum and everyday experience. After the interventions, a second questionnaire was applied, and the data were analyzed using the content analysis methodology proposed by Bardin (2011). The results indicated significant advances in the understanding of the concepts covered, demonstrating the pedagogical potential of non-formal spaces for promoting more meaningful learning.

KEYWORDS: Educational practices; Science teaching; Educational visits; Learning improvement; Content typology.

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Atividades de Educação Ambiental em espaços não formais: fomentando a aprendizagem conceitual de Biologia.

RESUMO

Este estudo investigou como ações educativas de Educação Ambiental, desenvolvidas em Espaços Não Formais de Ensino, podem contribuir para a aprendizagem de conteúdos conceituais por estudantes do Ensino Médio. Para isso, aplicou-se inicialmente um questionário diagnóstico com o objetivo de identificar os conhecimentos prévios dos alunos. Em seguida, foram realizadas visitas didáticas e atividades educativas em dois sítios localizados no município de Ibatiba (ES), com a finalidade de estimular o pensamento crítico e promover a articulação entre os conteúdos escolares e a vivência cotidiana. Após as intervenções, um segundo questionário foi aplicado, e os dados foram analisados por meio da metodologia de análise de conteúdo proposta por Bardin (2011). Os resultados indicaram avanços significativos na compreensão dos conceitos abordados, evidenciando o potencial pedagógico dos espaços não formais para a promoção de aprendizagens mais significativas.

PALAVRAS-CHAVE: Práticas educativas; Ensino de ciências; Visitas didáticas; Melhoria da aprendizagem; Tipologia de conteúdo.

Actividades de Educación Ambiental en Espacios no formales: fomentando el aprendizaje conceptual de Biología

RESUMEN

Este estudio investigó cómo las acciones educativas en Educación Ambiental, desarrolladas en Espacios No Formales de Enseñanza, pueden contribuir a la adquisición de contenidos conceptuales por parte de estudiantes de Educación Secundaria. Para ello, se aplicó inicialmente un cuestionario diagnóstico con el objetivo de identificar los conocimientos previos de los alumnos. Posteriormente, se realizaron visitas didácticas y actividades educativas en dos propiedades rurales ubicadas en el municipio de Ibatiba, Espírito Santo, con el propósito de estimular el pensamiento crítico y promover la conexión entre la teoría escolar y las prácticas cotidianas de los estudiantes. Después de las intervenciones, se aplicó un cuestionario final y los datos fueron analizados mediante la metodología de análisis de contenido propuesta por Bardin (2011). Los

resultados señalaron mejoras significativas en la comprensión de los conceptos científicos, lo que pone de manifiesto el potencial pedagógico de los espacios no formales para fomentar un aprendizaje significativo.
PALABRAS CLAVE: Prácticas educativas. Enseñanza de las ciencias; Visitas didácticas; Mejora del aprendizaje; Tipología de contenido.

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Introduction

Environmental Education emerged in response to growing concerns about the impacts of human actions on the environment and the urgent need to promote sustainability. Following the United Nations Conference on the Human Environment, held in Stockholm in 1972, this field gained international recognition as essential for forming critical and responsible individuals. Since then, it has played a fundamental role in raising societal awareness of ecological issues and in building an environmental consciousness (Carvalho, 2012).

More than simply transmitting knowledge about ecosystems and biodiversity, Environmental Education can be understood from different perspectives. The conservationist approach, of a more traditional nature, emphasizes preservation practices and the rational use of natural resources. The critical perspective, which guides this work, seeks to develop in learners a reflective stance regarding the relationship between human beings and nature, understanding the complexity of socio-environmental issues in articulation with social, economic, and cultural dimensions. When integrated into the school curriculum, this critical approach fosters the construction of conceptual, procedural, and attitudinal content, while simultaneously stimulating student engagement in processes of social transformation (Ribeiro; Cavassan, 2016).

Conceptual content is present in all learning environments, playing a central role in the construction of school knowledge. However, the way this

content is approached directly interferes with its assimilation. A concept taught in a vague manner and without connection to previously acquired knowledge tends to make no sense to the student and, consequently, is quickly forgotten (Zabala, 1998).

For concepts studied in the classroom to be effectively consolidated, it is crucial that they are revisited and applied in different contexts throughout the educational process. This practice contributes to the meaningful appropriation of knowledge and stimulates critical reflection on the reality experienced by the learners, establishing a relationship between school content and their everyday experiences (Pozo, 2000).

However, one of the main obstacles to conceptual learning is the prevalence of pedagogical practices that favor rote memorization over comprehension. Many students limit themselves to memorizing information without truly understanding or contextualizing it. In light of this, assessment must assume a qualitative character, focusing on analyzing the effective understanding of concepts, not just the quantity of correct answers. It falls to the teacher, in this process, to evaluate the degree of understanding that students demonstrate regarding the topics covered (Pozo; Crespo, 2009).

Conceptual content forms the structural basis of school curricula, being present in both traditional pedagogical proposals and more innovative approaches. Its centrality stems from the fact that mastery of concepts is indispensable for the development of procedural content, related to knowing how to do, and attitudinal content, associated with values, attitudes, and behaviors. Thus, the absence or weakness of this knowledge directly compromises learning in the other dimensions (Pozo; Crespo, 2009).

In this scenario, didactic Environmental Education activities carried out in non-formal educational spaces constitute powerful pedagogical strategies, capable of stimulating the active participation of students in the teaching and learning process. By promoting concrete and contextualized

experiences, these environments contribute to learner engagement and favor more meaningful and integrated learning (Mariano, 2020; Reigota, 2017).

The use of non-formal educational spaces, such as museums, parks, science centers, and natural areas, constitutes an approach to favor conceptual learning. These environments allow students to observe, explore, and interact directly with the phenomena being studied, which substantially enriches the educational process. Practical contact with scientific concepts, outside the limits of the traditional classroom, enables the transformation of abstractions into concrete experiences, facilitating the internalization of knowledge (Gomes; Lima, 2021).

Furthermore, non-formal spaces expose students to real and dynamic contexts that stimulate curiosity, intellectual autonomy, and critical thinking (Gohn, 2006). In these environments, students are encouraged to construct knowledge actively and collaboratively, applying learned concepts in practical and contextualized situations. This articulation between theory and practice strengthens the understanding of the content and expands the capacity to mobilize it in different situations, resulting in a more complete and meaningful educational experience (Marandino; Selles; Ferreira, 2009).

Given the above, this study aims to analyze the contributions of didactic Environmental Education activities, developed in non-formal educational spaces, to the promotion of conceptual learning.

2 Metodology

2.1 Ethical Aspects of the Research

This article originates from a master's research project, and its proposal was submitted to and approved by the Research Ethics Committee Involving Human Subjects (*Comitê de Ética em Pesquisa com Seres Humanos*) of the Federal University of Espírito Santo – Alegre Campus (*Universidade Federal do Espírito Santo – Campus Alegre*), *via* the Brazil Platform

(*Plataforma Brasil*) – CAAE: 59791422.4.0000.8151, in accordance with the Formal Opinion (*Parecer Consubstanciado*) No. 5.605.881 from the UFES Alegre Research Ethics Committee (*CEPE UFES Alegre*).

2.2 Research Characterization

The study employs a qualitative methodology. Qualitative research has a transdisciplinary character, encompassing the humanities and social sciences, and investigates local phenomena by interpreting the meanings that people attribute to them. By utilizing multi-method investigative approaches, this perspective facilitates the creation of diverse ways to describe the research process and present the results obtained (Chizzotti, 2003).

2.3 Research Context

The study was conducted in the municipality of Ibatiba, located in the state of Espírito Santo, Brazil. Ibatiba is known for its agricultural potential, standing out as one of the leading producers of Arabica coffee (*Coffea arabica*) in the state, with 99% of its cultivated agricultural area dedicated to coffee production. In addition, there are corn and bean plantations intended for subsistence farming (Incaper, 2020).

2.4 Characterization of the Research Participants

The research was conducted with 59 students enrolled in the second year of high school during the 2022 academic year at a state school located in the municipality of Ibatiba. This school serves students from various regions of the municipality, providing education from Elementary School (9th grade) to regular High School and Youth and Adult Education (EJA). The selection of the second-year classes was based on the guidelines of the Basic Curriculum for State Schools of Espírito Santo (CBEE-ES), specifically within

the context of Natural Sciences and Biology teaching. Within the Integrating Axis of Life, Living Beings, and Interactions, ecology content is addressed, offering a favorable opportunity to promote the association between theory and practice in the students' teaching-learning process.

2.5 Implementation of the Educational Activities

The educational activities were divided into two distinct stages. In the first stage, an initial semi-structured questionnaire (pre-test) was administered to the participating students. The objective of this stage was to gather information on the students' initial knowledge. Based on the information collected, it was possible to plan subsequent pedagogical actions in a more appropriate and contextualized manner, leveraging the students' prior knowledge.

In the second stage, we developed and implemented a didactic sequence involving Biology content, with a focus on Ecology. According to Zabala (2008), a didactic sequence is an organized and structured set of pedagogical activities planned with the objective of promoting the learning of specific content or developing certain skills in students. In this regard, we structured our proposal in stages, as described below, incorporating activities in non-formal educational spaces, the application of questionnaires, and data analysis.

First Stage: Activities Involving Environmental Education in Non-Formal Teaching Spaces

We conducted two educational activities on two rural properties in the municipality of Ibatiba (Figure 1). One property specializes in coffee production using an agroecological system, while the other is dedicated to grape cultivation without the use of agrochemicals.

FIGURE 1 – Educational Activity in Non-Formal Teaching Spaces Conducted in Agricultural Areas of the Municipality

Source: The authors.

For the execution of these activities, we had the support of an Agronomist who led the educational activities at the visited locations.

Second Stage: Learning Assessment Following the Educational Activities

In order to assess student progress following their participation in the educational activities, we administered a second semi-structured questionnaire. The collected data were then analyzed using the content analysis methodology proposed by Bardin (2011). Content analysis is defined as

> "A set of techniques for analyzing communications, aimed at obtaining, through systematic and objective procedures for describing the content of messages, indicators (quantitative or qualitative) that allow the inference of knowledge related to

> the conditions of production and reception (inferred variables) of these messages" (Bardin, 2011, p. 48, our translation).

Therefore, our objective was to analyze and interpret the content of the messages (whether oral, gestural, written, or even silent) expressed by the study participants throughout the research-related activities.

Table 1 presents the codes and categories used during the analysis process of the data from the second student questionnaire.

Table 1 – Codes and Categories from the Students' Second Questionnaire

CODES	CATEGORIES	DESCRIPTION
Conceptual Contents	- Concept of "environmental impact"; - Concept of "environment"; - Concept of "environmental education"; - Detection of local/agricultural environmental impacts; - Learning concepts in non-formal teaching spaces; - Use of Biology knowledge in daily life.	- To verify if there was any improvement in the students' learning related to Biology concepts after the implementation of the didactic sequence. - To perceive the relationship of the practical application of Biology topics after the implementation of the didactic sequence.

Source: The authors.

3 Results and Discussion

3.1 Initial Student Questionnaire

Table 2 analyzes the students' prior conceptual knowledge of subjects related to Biology, specifically Ecology.

Table 2 - Categories, Subcategories, and Recording Units Related to the Code "Students' Prior Knowledge of Conceptual Content"

CATEGORIES	SUBCATEGORIES	RECORDING UNITS
Concept of Biological Control	Don't Know/Little Connection	"I don't know." "Maybe something that can be used to prevent extinction." "In my view, biological control is controlling nature, both for good and for bad, but mostly for good."
	Don't Know/Little Connection	"Something that is somehow being controlled or is under someone's control." "I believe it's the control of beings and the environment for better analysis and preservation."
	Combating Agricultural Pests	"Controlling agricultural pests and disease-carrying insects using their natural enemies." "Control of insects, pests, and others that can harm the agricultural environment."
Concept of "Environmental Education"	Don't Know	"I don't know."
	Preserving the Environment	"Teaching how to care for the environment." "A field of study that aims to teach how to care for the environment, creating solutions not harmful to it."
	Raising People's Awareness	"Raising people's awareness not to pollute rivers, prevent burnings, etc." "An action where people (collectively) come together to build social values and knowledge focused on the environment."
	Don't Know	"I don't know"
	Natural Environment	"Nature, trees, and plants." "Any kind of place that has woods, a river, or even a backyard." "Nature. When talking about the environment, what comes to my mind is water, trees, wind, etc." "The natural part that surrounds us, the air, rivers, plants, and animals."

Source: The authors.

Regarding the concept of "biological control" and based on the students' prior knowledge, there is a knowledge deficit among the students concerning the term. This is noteworthy because the topic has already been covered in previous school grades (Lower Secondary Education and the first year of High School), and its definitions are not highly complex. Since the content has not been fully assimilated by the students, it needs to be revisited and reinforced to ensure they have a solid knowledge base on the subject.

Analyzing the students' responses in more detail, when asked about their understanding of the concept of "biological control," 45% of the students were unable to answer, limiting their response to stating they did not know. Approximately 51% of the students provided answers with little connection to the expected correct response, referring to the term as something related to controlling people or some form of controlling living beings. Only four students answered as expected, relating the term to situations of pest control by other living organisms.

The findings of this work corroborate the results obtained by Faria, Tardin, and Roque (2020). After applying a questionnaire, it was found that only 20% of the participants were knowledgeable about the meaning of the term "biological control." However, this value increased to 70% after practical activities related to the theme were conducted.

The lack of association between the use of living organisms and the control or combat of pests in plants or animals (Parra *et al.*, 2002) indicates that most research participants do not master the knowledge about the definition of "biological control," nor are they able to exemplify biological control with related situations.

The data also show a deficiency in the students' mastery of knowledge related to the term "environmental education." Of the total number of students who answered the questionnaire, about 27.1% were unable to define, let alone relate the term "environmental education" to any situation they experience daily. Approximately 42.3% associated the term with actions to raise awareness for the prevention of environmental problems, mainly those

related to environmental pollution. Only two students (3.3%) linked the term to issues of socio-environmental awareness.

The data we found are similar to those obtained by Lacerda and Oliveira (2013) in a study with high school students in a city in Goiás. However, these results differ from those found by Cavalcante (2018), who analyzed the perception of high school students regarding environmental education and found that 97% of the students enrolled in the second year of high school knew the definition of the term "environmental education." On the other hand, research conducted by Venturieri and Santana (2018) regarding the perception of 50 students about what environmental education is showed that 50% of the students stated that environmental education is about educating and teaching how to care for the environment.

The lack of student knowledge about the term "environmental education" may be linked to how the theme is being addressed in educational institutions, in a manner disconnected from their daily lives or distant from the students' reality, thus discussed in a decontextualized and non-reflective way. In this sense, environmental education is not seen as an essential component of the educational process. Behavioral change will only be possible if sensitization first occurs, through the problematization of adopted actions, so that students can understand that all of us, in all places, have social and environmental responsibilities (Loureiro, 2009).

When students were questioned about the concept of "environment," about 90% (53 students) responded that the term is associated with aspects linked to nature, such as forests, animals, and rivers. About 5% (three students) were unable to explain the meaning of the term, while another 5% included human beings as an integral part of the environment. Our results corroborate those of Repolho *et al.* (2018), who also observed that 42.7% of the students from a school participating in the survey understand the environment as something related to nature, that is, they associate environmental factors with specific elements like rivers and forests.

It is observed that the students tend to view the term "environment" as associated with a single isolated element, such as a river or a tree, without considering the relationships between the components that form it. They do not understand, for example, that a river is composed of various elements, such as water, fish, stones, and algae, which interact and form a complex ecosystem.

In other words, "environment" is a concept that encompasses much more than just isolated elements. It refers to the relationships between living beings (biotic) and the environment (abiotic). This definition also includes human beings, who have a significant influence on the environment and other living beings that share the same space. These influences can be both positive and negative, highlighting human responsibility in the preservation and conservation of the environment (Reigota, 2017; Geraldino, 2014).

Therefore, it is essential to provide students with a more holistic and interconnected understanding of the concept of "environment," encouraging an integrated view of the elements that make up ecosystems and recognizing that sustainability goes beyond the static notion of environmental balance by articulating social, economic, political, and cultural dimensions. In this sense, the collective well-being of humans and non-humans depends not only on ecological preservation but also on the implementation of effective policies for socio-environmental justice that address inequalities and value the interdependence among all life forms.

This perception that we are part of the environment and that our way of living and acting can directly impact other components of the environment is essential for reflecting on our responsibility and taking concrete measures to preserve ecosystem balance. It is through this awareness that we can contribute to a sustainable future for the next generations and maintain biodiversity and environmental health (Geraldino, 2014).

3.2 Second Questionnaire Administered to the Students

All 54 students who participated in the educational activities related to the didactic sequence responded to the second semi-structured questionnaire.

We conducted an analysis of the students' conceptual knowledge in relation to the Biology subject following the completion of the didactic sequence. The codes, categories, subcategories, and recording units used in the analysis process are presented in Table 3.

Table 3 – Categories, Subcategories, and Recording Units Related to the Code "Conceptual Contents" Following the Didactic Sequence Conducted with the Students

CATEGORIES	SUBCATEGORIES	RECORDING UNIT
Concept of "Environment"	Do Not Know	"I don't understand much." "I practically don't understand anything." "I don't know."
	Biotic and Abiotic Factors	"The environment is life, vegetation, animals, microorganisms, soil, rocks, atmosphere, water, and air." "The environment encompasses all living and non-living elements related to life on Earth. It is everything that surrounds us, like water, soil, vegetation, climate, animals, human beings, among others." "They are living and non-living elements, like soil, vegetation, climate, animals, human beings." "It is the set of ecosystems, of biotic and abiotic factors."
	Natural Factors	"Living beings and nature, the environment is both the nature and the living beings around it."

Concept of "Environment"		"Everything found around us, woods, waterfalls, water springs, etc." "In my mind, the environment is everything that is created by nature."
	Human/Nature Interaction	"The place where we, human beings, animals, and plants live." "The fauna and flora together with human life." "The environment is basically the whole place we live in, every living being or plant, like vegetation, microorganisms."
Concept and Importance of "Environmental Education"	Do Not Know	"I don't know."
	Environmental Preservation	"To have an idea of what is harmful or not to the environment." "Environmental education is important for them to become even more aware of the consequences caused by deforestation, etc." "To preserve the environment."
	Environmental Awareness	"To raise awareness about the dangers of mistreating the environment." "To raise awareness and teach the best way to care for the environment." "Environmental education is important to make people aware of preserving the environment."

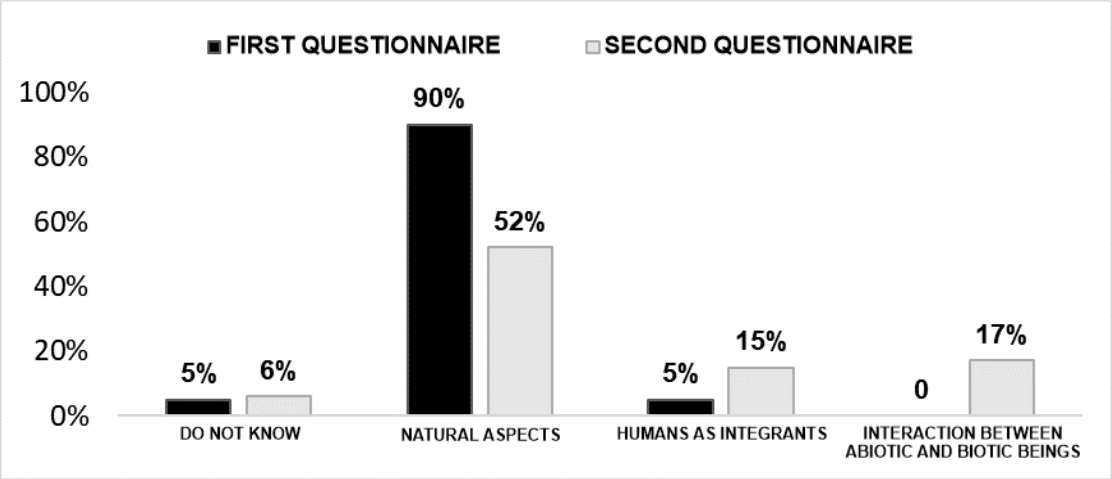
Concept and Importance of "Environmental Education	Socio-environmental Sensitization	"It involves issues of socio-environmental responsibility." "It plays an important role because it makes society aware of environmental problems and how to avoid them." "Environmental education brings society knowledge about ways to conserve the environment, as well as more sustainable ways of living." "Environmental education is extremely important for society, as it enables a new vision of the world based on knowledge of new ways of life." "It is to contribute to the formation of a conscious citizen, able to decide and act in the socio-environmental reality in a way committed to life, to the well-being of each individual and society."
Learning Concepts in Non-Formal Teaching Spaces	Regular	"I wasn't very willing to learn." "Regular, because sometimes it's not very good."
	Good	"Because I managed to see and understand things I didn't understand before." "In my opinion, learning in non-formal spaces is greater because we can see everything being explained, which makes understanding easier." "I became much more interested than if I were in the classroom."

Learning Concepts in Non-Formal Teaching Spaces	Very Good	"It makes the subject more memorable in our minds; if it were just a lesson inside the classroom, like all the others we have, we would easily forget the content." "A lesson in another environment, the memories will be marked for the rest of your life." "Very good, I found the way they showed learning very interesting, teaching us in practice what we cannot see in the classroom." "There I can pay more attention and feel more interested in the subject mentioned that day."

Source: The authors.

Regarding the definition of "environment," the data revealed that the percentage of students who did not know the meaning of the term changed little compared to the first questionnaire, totaling 6% (three students). However, 28 students (52%) related the term to natural factors, a smaller number compared to the first questionnaire (53 students, 90%). Eight students (15%) included in their responses the interaction between humans and nature, which demonstrates an advancement compared to the first questionnaire. The emergence of responses that related both living (biotic) and non-living (abiotic) elements in the definition of the term "environment" was notable, present in 17% of the responses (nine students). These data indicate a broader and more integrated understanding of the environment by the students after carrying out the activities in non-formal teaching spaces. Figure 2 illustrates the comparison between the responses obtained in the initial questionnaire and the subsequent questionnaire.

Figure 2 – Comparison of Responses from the First and Second Questionnaire Regarding the Concept of "Environment"

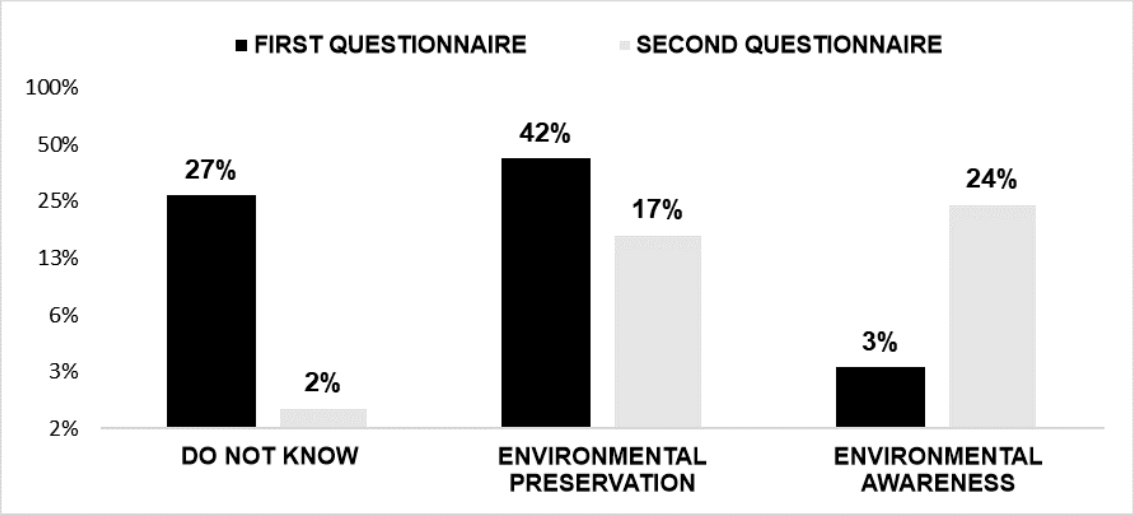


Source: The authors.

When analyzing the notion of "environment," we observed that the responses showed a more detailed and substantial approach, indicating a deeper and more meaningful understanding of the term. The responses involved the interaction of different organisms within a specific region. This observation contrasts with the first questionnaire of the research, where the responses were brief and limited to simple words. In this sense, we observed a conceptual evolution in the learners after completing the didactic sequence on the notion of "environment." However, few responses included human beings as an important part of environmental conservation.

Regarding the concept of "environmental education," it can be observed that most students were able to define it and comment on its importance for society. Figure 3 presents the comparison between the responses obtained in the first and second questionnaires.

Figure 3 – Comparison of Responses from the First and Second Questionnaire Regarding the Concept of "Environmental Education"



Source: The authors.

Based on the presented data, we can conclude that there was an improvement in the students' understanding of the concept of "environmental education." The decrease in the number of students who were unable to define or relate to the topic, coupled with the increase in those who associate environmental education with socio-environmental awareness actions, indicates progress in the process of ecological awareness among these students. This reinforces the importance of environmental education initiatives in schools and the need to carry out educational activities in spaces that bridge school knowledge with the students' real-life experiences.

This adjustment in the students' knowledge regarding the term "environmental preservation" can be interpreted as an advancement in conceptual understanding. The students demonstrated a better grasp of the meaning of this term, reflecting the development of knowledge related to the conceptual contents of environmental education. This progress serves as a positive indicator of the impact of the educational actions and the pedagogical approach adopted.

When asked about their perception of the educational visits and activities carried out in the non-formal teaching spaces, approximately 66.6% of the students rated them as very good, 25.9% as good, and only 7.4% as regular. The majority of students participating in these activities considered them very good. It is important to highlight that student satisfaction with the activities can influence their motivation to learn and their perception of the relevance of the actions developed in these spaces. The results obtained in this study are consistent with those of Araújo Júnior (2020), Pereira (2020), Santos (2016), and Silva (2018), where didactic sequences in non-formal spaces proved to be an effective strategy for enhancing student learning in Biology, especially regarding ecology-related topics.

This study also demonstrates the effectiveness of a contextualized teaching methodology in real socio-environmental situations within the Biology teaching-learning process. This didactic strategy promotes more meaningful and critical learning and allows learners to better understand scientific concepts and their application in daily life. Therefore, it is important for teachers to consider the use of non-formal spaces in their pedagogical practices as a means to enrich learning and promote the holistic development of students.

Marandino, Selles, and Ferreira (2009) state that the use of non-formal spaces during Biology classes, when well planned, can be a valuable tool for the teaching-learning process. In addition to contributing to the understanding of historically constructed concepts, these activities also have the potential to promote learners' social development, facilitating interpersonal interaction, providing opportunities to engage in different contexts, and enabling the exchange of experiences and the collective construction of knowledge.

According to Pozo (2000), the learning of conceptual content can be achieved through the problematization of didactic activities related to themes that hold some significance for the students, topics with which they have prior knowledge, allowing them to more consistently anchor the new information

transmitted by the teacher. Didactic sequences are important tools for providing students with a contextualized way of learning and deconstructing concepts, leading them to question everyday situations and organize and build knowledge in a meaningful and effective way. Pozo and Crespo (2009) also advocate for this approach, emphasizing the importance of constructing knowledge based on students' experiences and their interaction with the environment in which they are situated.

4 Final Considerations

The study's results demonstrate the effectiveness of the contextualized teaching methodology in real socio-environmental situations, promoting more meaningful and critical learning. This approach enabled students to gain a better understanding of scientific concepts and their application in daily life. Therefore, it is essential for teachers to integrate non-formal spaces into their pedagogical practices to enrich learning and promote a more holistic development of students.

The learning of conceptual content is enhanced by the problematization of didactic activities that are meaningful to students, anchoring new information in prior knowledge. Furthermore, the study's data reveal that the use of non-formal teaching spaces has a significant impact on student motivation and engagement. Activities conducted outside the traditional classroom environment spark curiosity and interest, factors that are essential for deep and lasting learning. Direct interaction with the environment and the practical application of acquired knowledge contribute to better retention and understanding of the content, reinforcing the need for diversification of teaching methodologies.

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