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Teaching practices in science education in the early grades: the environmental perspective

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ABSTRACT

This study investigated how teachers in the early grades of Elementary School in the city of Rio Quente, Goiás, Brazil, guide their teaching practices in Science, highlighting the challenges and potentialities of integrating Environmental Education into the school curriculum. This is a qualitative research study that used semi-structured interviews as its data source, conducted individually with teachers from this stage of education. The corpus was analyzed through Discursive Textual Analysis, a methodology that organizes data into analytical categories to produce new understandings. One of the emerging categories from the analysis revealed unanimous recognition by the teachers of the importance of addressing environmental topics in Science classes. The teachers emphasized the need to raise students' awareness of environmental preservation and the promotion of sustainable practices. However, the teaching practices varied in depth and scope, with some being isolated and others more integrated into the curriculum. It is concluded that, although there is an effort to include Environmental Education in school practices, challenges remain to be overcome, especially with regard to the continuity and systematization of these actions. This study contributes to reflections on the importance of teacher training and the development of pedagogical policies that promote the consistent inclusion of Environmental Education in the school curriculum.
KEYWORDS: Environmental Education; Science education; Teaching practices; Early grades of Elementary School.

Práticas pedagógicas em ensino de ciências nos anos iniciais: o viés ambiental

RESUMO

Este trabalho investigou como professoras dos anos iniciais da cidade de Rio Quente - Goiás orientam suas práticas pedagógicas em Ciências, evidenciando desafios e potencialidades na inserção da Educação Ambiental no currículo escolar. Trata-se de uma pesquisa qualitativa que utilizou entrevistas semiestruturadas como fonte de dados, realizadas individualmente com professoras dessa etapa de ensino. O corpus foi analisado por meio da Análise Textual Discursiva, metodologia que organiza os dados em categorias analíticas para produzir novos entendimentos. Uma das categorias emergentes da análise evidenciou reconhecimento unânime, por parte das professoras, acerca da importância de abordar temáticas ambientais nas aulas de Ciências. As docentes ressaltaram a necessidade de sensibilizar os estudantes para preservação do meio ambiente e para a promoção de práticas sustentáveis. No entanto, as práticas pedagógicas apresentaram variações em profundidade e abrangência, com algumas sendo pontuais e outras mais integradas ao currículo. Conclui-se que, embora exista um esforço para incluir a Educação Ambiental nas práticas escolares, ainda há desafios a serem superados, especialmente no que se refere à continuidade e sistematização dessas ações. Este estudo contribui para a reflexão sobre a importância de capacitar professores e desenvolver políticas pedagógicas que promovam a inserção consistente da Educação Ambiental no currículo escolar.
Palavras-chave: Educação Ambiental; Ensino de Ciências; Práticas Pedagógicas; Anos Iniciais.

INTRODUCTION

Guimarães (2004) emphasizes that Environmental Education must be a continuous and permanent process, beginning at the preschool level and extending through all stages of formal and informal education. Thus, Environmental Education plays a vital role in the formation of children in the early grades of Elementary School, as it is during this period that the foundations for the development of sustainable values and attitudes begin to take shape. The *Base Nacional Comum Curricular* (BNCC) [the Brazilian Common Core State Standards] (Ministry of Education, 2018) establishes as one of the objectives of Science teaching in the early grades of Elementary School the development of students' ability to perceive the world around them from a different perspective. In this sense, educational legislation guides the teaching process to enable students to make decisions and take action consciously, grounded in the values of sustainability and the common good.

In this regard, Reigota (2009) states that Environmental Education must go beyond the mere transmission of information and be understood as an educational process that awakens children's critical awareness of their relationship with the environment, enabling them to understand their interdependence with nature and to develop a responsible and ethical view of natural resources:

> The idea of citizenship education that includes attitudinal content must begin in the early grades, through content that involves knowledge and awareness of the environment, in such a way that children recognize themselves as part of this environment and, therefore, develop attitudes of care and affection toward the world in which they live.
>
> Although Environmental Education is a highly complex field, it is important to recognize that citizenship-oriented education and social engagement should be guiding principles at all levels of Basic Education, forming a methodological axis for the development of active and responsible citizens (Oliveira & Caldeira, 2018, p. 5).

Thus, the authors advocate that citizenship education, grounded in attitudinal content, should begin in the early grades of Elementary School through approaches that promote environmental knowledge and perception. Such an approach encourages children to recognize themselves as integral parts of the environment, fostering attitudes of care and emotional connection. Given the complexity of Environmental Education, it is argued that it should be incorporated transversally across all levels of Basic Education, forming a methodological foundation capable of fostering the development of critical, aware, and socially engaged individuals.

In this same regard, Müller and Silva (2023) emphasize that Environmental Education fosters an understanding of the importance of conserving the environment and reinforces the need to establish a balanced relationship between humans and nature. Through this process, sustainable habits and actions are encouraged, shaping citizens who are aware of their role in protecting the planet. The authors also highlight that Science education plays a key role in developing students' understanding of the environment in which they live—a process that should begin as early as preschool and be expanded during the early grades of Elementary School, encouraging the adoption of sustainable actions, such as valuing water and environmental preservation, as well as engaging in concrete practices like proper waste separation.

In the early school years, children are at a developmental stage in which educational experiences have a significant impact on their future perceptions and behaviors. In this sense, Sorrentino (1997) argues that environmental awareness should begin early, fostering an emotional connection between students and the environment. According to the author, this bond is essential for children to feel like an integral part of nature, which, in turn, encourages the adoption of preservation and sustainability practices.

Moreover, Aragão and Dutra (2017) point out that the inclusion of Environmental Education in the curriculum of the early grades not only enriches teaching but also contributes to the formation of conscious citizens committed to sustainability. Addressing environmental issues in Science classes and other subjects—i.e., integrating Environmental Education into the curriculum—is therefore a promising path for preparing children to face both current and future ecological challenges.

Lenhardt (2020) stresses that Environmental Education arises as a response to the environmental crisis and aims to promote an urgent shift in the relationship between society and nature.

Environmental Education, which is essential both to the exercise of full citizenship and to environmental conservation in the pursuit of quality of life, is a key component in reflecting on a more sustainable societal model. The National Environmental Education Policy (Law no. 9.795, April 27, 1999) emphasizes that Environmental Education should begin in the earliest stages of schooling, fostering the development of a critical and ethical awareness of socio-environmental issues. This means that children and young people should be encouraged from an early age to reflect on their relationship with the environment, developing responsible and sustainable attitudes. Furthermore, the Environmental Education approach should be contextualized—that is, connected to local, regional, and global realities—valuing students' daily lives and the environmental issues that affect them. The goal is for students to understand the interrelationship between social, economic, cultural, and environmental aspects, thereby fostering the development of conscious citizens actively engaged in transforming society.

This Environmental Education must also be transformative, awakening in children a sense of responsibility and care for the environment by promoting everyday practices of preservation and sustainability. According to Loureiro (2009), to educate means, first and foremost, to revolutionize—to undergo self-transformation—since Environmental Education must be transformative, educational, cultural, informative, political, formative, and, above all, emancipatory: "To revolutionize means the integral transformation of our being and of the objective conditions of our existence; it is the coincidence of the modification of circumstances with the transformation of the self, in our movement toward becoming a natural being" (p. 82). According to the author, transformative Environmental Education proposes a new way of relating to ourselves, to other species, and to the environment. This perspective seeks to overcome social practices that harm the common good, social justice, and solidarity, and is intrinsically linked to the need for essential ethical changes. These goals not only guide Environmental Education but also contribute to shaping more conscious citizens, committed to building a more just and sustainable society. The path to achieving these goals should be playful and interdisciplinary, aligned with

children's lived experiences so that they can internalize the concepts in meaningful and lasting ways.

Based on these arguments, this study was developed within a Graduate Program in Education and grounded in a qualitative research project conducted in the municipal school system of Rio Quente, in the state of Goiás, Brazil. The municipality, located in a prominent tourist region and home—alongside Caldas Novas—to the largest hydrothermal resort in the world, has an economy predominantly focused on tourism. This local characteristic reinforces the importance of incorporating pedagogical practices[1] that raise children's awareness about the preservation of natural resources and sustainability, especially in communities whose livelihoods depend directly on the environment.

Thus, the aim of this study was to investigate how teachers in the early grades of Elementary School in the city of Rio Quente, Goiás, guide their teaching practices in Science, highlighting the challenges and potentialities of integrating Environmental Education into the school curriculum.

METHODOLOGICAL APPROACH

The corpus of this study was composed of semi-structured interviews conducted with teachers in the early grades of Elementary School. According to Gil (2008), this technique is an effective tool for exploring participants' experiences and opinions, allowing for a detailed and contextualized analysis. Furthermore, data analysis was conducted based on the principles of Discursive Textual Analysis (DTA).

This study thus aims to contribute to academic and practical discussions regarding the integration of Environmental Education into Science teaching. It highlights teachers' perceptions, the pedagogical practices implemented, and the challenges faced throughout this process, offering valuable insights for the development of educational policies and pedagogical strategies focused on incorporating Environmental Education into Basic Education and promoting sustainability.

To achieve the objectives proposed in this research, the involvement of human participants was essential—specifically, teachers working in the early grades of Elementary School in the municipality of Rio Quente, Goiás. Ethical procedures were rigorously observed, and the research was approved by the Research Ethics Committee of the Federal University of Catalão (CEP-UFCAT, acronyms in Portuguese), under Ethics Approval Certificate (CAAE) no. 69184923.1.0000.0164.

This study was developed within the framework of qualitative research, a methodological approach that seeks to explore and understand complex phenomena from a contextual and interpretive perspective. This type of research is particularly useful in fields such as the social sciences, education, health, and anthropology, where the goal is to understand perceptions, behaviors, and social interactions in their natural environment (Bicudo, 2021).

According to Bicudo (2021), qualitative research is grounded in a conception of reality as an organic totality of forces in constant and dynamic movement. Reality

is always in a state of transformation and reveals itself in the very act of being. Bicudo emphasizes that this reality is continuously elusive to researchers who attempt to observe it objectively (Bicudo, 2021).

The study was conducted with teachers[2] from the early grades of the Municipal Public Education System in Rio Quente, a small town in the interior of the state of Goiás, located near the city of Caldas Novas. Together, Rio Quente and Caldas Novas form the largest hydrothermal resort in the world. As a result, the primary economic activity in both municipalities is tourism. In terms of territorial scope, Rio Quente has limited agricultural activity, and its income derives almost entirely from tourism. The municipality's population was estimated at 4,728 inhabitants, according to data from the Brazilian Institute of Geography and Statistics ([IBGE], 2021).

The school where the participating teachers work is the only Elementary School in the city. It offers the following stages of Basic Education: Early Childhood Education – preschool levels for ages 4 and 5; Elementary Education I – 1st to 5th grades; Elementary Education II – 6th to 8th grades; and Youth and Adult Education (EJA, acronym in Portuguese) – 3rd to 6th semesters of Stage II. The school employs approximately 54 teachers, most of whom work within their field of expertise. In 2024, the school served around 623 students, of whom 245 were enrolled in the early grades of Elementary School, which are the focus of this study.

In 2024, the school offered four Early Childhood Education classes, 12 classes in the early grades of Elementary School, eight classes in the final grades of Elementary School, and four *EJA* Stage II classes. Class groupings are defined at the beginning of the school year by the teachers in collaboration with the school's Pedagogical Team.

The data for this research were collected through semi-structured interviews. Interviews are a central tool in qualitative research, offering a direct window into participants' experiences, opinions, and emotions. They allow researchers to gather rich, detailed data that would be difficult to capture through quantitative methods. Interviews can be structured, semi-structured, or unstructured, each offering different degrees of flexibility. Structured interviews follow a predefined set of questions, facilitating comparison across responses; semi-structured interviews strike a balance between consistency and the exploration of emerging topics, allowing the researcher to rephrase a question if it is not adequately addressed; unstructured interviews are more open-ended, enabling deeper exploration of themes as they arise during the conversation (Bicudo, 2021).

In the case of semi-structured interviews, questions may be reformulated if the participant has difficulty understanding them or diverges from the topic under discussion. This dynamic adjustment is essential to ensure the relevance and depth of the responses, allowing the interviewer to gather accurate and meaningful information. The flexibility in question reformulation helps make participants feel more at ease and enhances their understanding of what is being asked, facilitating clearer and more coherent expression of their ideas and experiences. Additionally, redirecting the focus of the interview when necessary helps prevent deviation from the central theme, ensuring cohesion and relevance in the discussion. This process can also reveal new perspectives and insights that might be missed in a more rigid approach. Therefore, the ability to adapt questions and keep the

participant focused is crucial for the effectiveness and depth of the interview (Bicudo, 2021).

The interviews were conducted in person, individually, and lasted approximately one hour. The questions were presented orally, and responses were given in the same format, allowing participants to speak freely within the context of the research and to share their experiences spontaneously (Gil, 2008). All interviews were audio recorded, transcribed, and stored for later analysis.

To ensure participants' anonymity while preserving the individuality and personality observed in their responses, each teacher was assigned the name of her first childhood teacher.

Data collection began with a questionnaire designed to outline the participants' profiles, including information on age group, gender, teaching experience, initial training, continuing education, the school network(s) in which they work, and weekly workload. The results show that the teachers' ages ranged from 35 to 55 years, with teaching experience varying from 5 to 23 years—demonstrating that they are experienced professionals. Most of them work exclusively in Rio Quente (8 teachers, 72%), two also work in Caldas Novas, and one works additionally in Morrinhos. Their weekly workload ranges from 40 hours (8 teachers, 72%) to 60 hours (3 teachers, 28%).

Only one teacher did not hold a degree in Pedagogy, and four out of the eleven teachers held dual majors in their undergraduate training. Only one had not taken any continuing education courses, while the others had completed postgraduate specialization programs. At the time of the interview, one of the teachers was enrolled in a *stricto sensu* graduate program (Master's in Education).

The interview data were analyzed using the principles of DTA, a methodology for qualitative data interpretation. As Moraes and Galiazzi (2016) explain, "in DTA, researchers become aware that their interpretations must necessarily begin within themselves, in the understandings and preconceptions they already bring into the research context (…)" (p. 247). The authors present DTA as a qualitative data and information analysis methodology aimed at producing new understandings of phenomena and discourse (Moraes & Galiazzi, 2016).

DTA is an organized process composed of three stages: unitization, categorization, and communication. Regarding the organization of data analysis through DTA, Silva and Marcelino (2022) highlight the following procedures:

> Selection and/or production of the corpus; unitization of the corpus; organization of initial, intermediate, and final categories based on the approximation of meanings derived from the unitization; and finally, the production of metatexts. Regarding the corpus, it is important to note that its raw material consists of textual productions—both those generated specifically for the research (such as interview transcripts, observation notes, written narratives, annotations, and personal diaries), and pre-existing documents, including reports, various publications such as newspaper and magazine editorials, meeting minutes, legislation, among other types of documents (pp. 117–118).

From this perspective, it becomes clear that the production and selection of the corpus are crucial steps in research, as they determine the database upon which all subsequent analyses will be conducted. The corpus may consist of various types of texts, either produced specifically for the study or already existing. Texts produced for research purposes include interview transcripts, observation records,

written testimonies, annotations, and multiple personal diaries. Pre-existing documents may include reports, publications such as news editorials, meeting minutes, legal documents, among others. The careful selection of the corpus ensures that the research is grounded in relevant and comprehensive data. In this study, the corpus consisted of the interviews conducted.

The data analysis process in this research, based on DTA, began with the unitization phase, characterized by an in-depth and reflective reading of the empirical material—in this case, the interview transcripts from teachers in the early grades of Elementary School in Rio Quente, Goiás, who work in Science education. This initial analytical stage involved intentionally fragmenting the corpus in order to extract units of meaning aligned with the objectives of the investigation (Silva & Marcelino, 2022).

Unitization thus allowed the researcher to reorganize the text based on meaningful elements, enabling new interpretations through deep immersion in the content. Repeated readings helped identify relevant excerpts, which were highlighted in different colors according to their meanings, as part of a pre-categorization process. Some excerpts were multifaceted and were classified under more than one category (Melo, 2023). This initial phase of deconstructing the material laid the foundation for the later reconstruction of data through categorization.

In the context of DTA, unitization engages the researchers directly with the material, deepening their understanding through detailed analysis. Categorization, in turn, groups these units based on similarities, providing a logical and interpretive structure for the analysis. These procedures align with a phenomenological approach, in which the researcher seeks to understand the phenomenon through the participants' subjective experiences, allowing categories to emerge organically and honoring the complexity of qualitative data.

This process culminates in the writing stage, in which the structured categories serve as the foundation for producing analytical metatexts. The final narrative not only presents the findings but also reflects the researcher's interpretive and reflective journey (Moraes & Galiazzi, 2016). As Adams (2020) affirms, categories are the core elements that organize and guide scientific writing, shaping the interpretations that emerge from the analysis.

With regard to categorization methods, a distinction is made between deductive and inductive approaches. While the former begins with pre-established categories, the latter—adopted in this study—constructs categories based on the emergent units identified during the unitization phase (Melo, 2023; Moraes & Galiazzi, 2016). Although this research draws upon prior theoretical frameworks, the categories were developed through comparative analysis of the units of meaning extracted during the textual deconstruction. This article focuses on one of the categories constructed during the analysis: *Teaching practices in Science education: the environmental perspective*.

The DTA conducted in this study led to the emergence of four analytical categories: Initial and continuing teacher education of early grades teachers in Rio Quente – Goiás in the context of Science education; Teaching practices in Science education: What kind of Science education do we have in the early grades in Rio Quente – Goiás?; The importance of Science education for early grade students:

discourse versus practice; and teaching practices in Science education: the environmental perspective — the category explored in this article.

RESULTS AND DISCUSSION

To contextualize the discussion, we begin by presenting information about the teaching methodologies and instructional resources used by the teachers, as reported during the interviews. The data reveal a clear effort by the teachers to diversify their teaching strategies and materials.

The main activities and methodologies[3] described by the teachers in the interviews included: experimentation; investigative activities; demonstrations; field research; guest lectures (e.g., by a nutritionist); forums and debates; case studies; knowledge problematization; knowledge contextualization; adaptation to students' prior knowledge; adaptation to the local context (e.g., natural disasters); and hands-on and differentiated lessons. The primary instructional resources[4] mentioned included: textbooks; various types of texts (newspapers, magazines, clippings, internet sources, and other books).

These activities demonstrate a broad methodological diversity, with a focus on practices ranging from investigative and problem-based approaches to strategies that promote dialogue and contextualization.

Table 1 presents the organization of the main teaching activities/methodologies and instructional resources used by Science teachers in the early grades of Elementary School in Rio Quente – Goiás, as reported in the interviews and according to their frequency of use.

Table 1

Frequency of use (Citations in interviews)

Activity	Frequency of citation
Experimentation	9
Investigative activities	7
Forums and debates	6
Guest lectures with specialists	6
Knowledge problematization	5
Case studies	5
Field research	5
Demonstrations	4
Knowledge contextualization	2
Adaptation to prior knowledge	1
Adaptation to the local context	1
Hands-on and differentiated lessons	1

Source: Authors (2024).

The most frequently mentioned practices—such as experimentation, investigation, and debates—indicate a trend toward methodological diversification in Science teaching. However, alignment with a critical perspective in Environmental Education is only achieved when these activities are contextualized within the local reality, promote collective reflection, problematize the relationship between society and nature, and encourage active student participation. Practices implemented in a purely technical or isolated manner—such as demonstrations or traditional lectures—tend to reinforce a conservationist approach, focusing solely on individual behaviors or fragmented content.

Analyzing teaching practices based on teachers' accounts, though valuable, does not allow for definitive conclusions regarding whether these actions align with a critical or a conservationist orientation in the field of Environmental Education. Therefore, it is essential to consider that the intent behind a given practice does not always translate into its actual pedagogical implementation. Classifying such practices requires direct observation, analysis of teaching materials, listening to students' perspectives, and an understanding of the broader pedagogical project in which the practice is embedded. As Loureiro (2009) argues, critical Environmental Education demands the articulation between theory and practice—an articulation that can only be assessed in its concrete enactment, not merely in its description.

Thus, the analysis of teaching practices cannot be reduced to a simple classification based on keywords or isolated actions. Understanding whether a practice is critical or conservationist in nature requires an interpretative, contextualized, and triangulated approach involving multiple data sources and levels of analysis—an approach that was not possible within the scope of this study.

Nevertheless, the analysis of the interviews revealed unanimous agreement among the teachers on the relevance of addressing environmental topics in Science classes. Their responses reflect a concern with contextualizing Science teaching in light of contemporary socio-environmental challenges, indicating efforts to integrate Environmental Education meaningfully into the early grades of the Elementary School curriculum.

Environmental Education plays a fundamental role in children's development, particularly in the early grades of Elementary School, by introducing concepts and practices aimed at environmental preservation and sustainability. At this crucial stage of education, children are developing their perceptions of the world and beginning to understand the impact of human actions on the environment. For this reason, Science teaching should go beyond the transmission of academic content to also address environmental issues in an integrated and contextualized manner, helping children to make sense of the world and to recognize their responsibilities for its sustainability.

In this regard, the teachers echo the view of Reigota (2009), who argues that Environmental Education should help students understand their interdependence with the environment, realize that they are part of nature and not separate from it, and develop a responsible, ethical, and critical view of nature and society. Of course, based solely on the activities described, it is not possible to assess whether the teachers' conceptions are fully aligned with the practice of critical

Environmental Education. However, our analysis was based on their testimonies, which showed concern for fostering critical thinking among their students.

The integration of pedagogical practices aimed at sustainability not only enriches the school curriculum but also contributes to the formation of conscious and responsible citizens. Environmental Education helps children understand the importance of preserving natural resources, the impact of pollution, and the need to adopt sustainable practices in their daily lives. Furthermore, by addressing topics such as recycling, water conservation, and ecosystem protection, teachers can foster a critical and proactive mindset in children, encouraging them to actively engage in solving environmental problems.

Aragão and Dutra (2017), Baumgarten et al. (2017), Fragoso and Nascimento (2018) discuss the importance of introducing Environmental Education at this stage of schooling, as it fosters the development of children who are more responsible toward the world. In this sense, it is worth highlighting that the teachers interviewed described a strong interconnection between the Science content taught in the early grades and environmental concerns. The teachers shared a common understanding that Science education plays a key role in raising awareness and fostering environmental consciousness among their students, as well as in helping them recognize the importance of protecting the environment.

According to the teachers, raising environmental awareness among children in the early grades is a fundamental strategy in Science education, as it aims to awaken in them the understanding that they are part of nature and, therefore, share responsibility for its preservation. For these educators, Science teaching must go beyond the transmission of specific content; it should also stimulate critical thinking and reflection on the relationship between humans and the environment. In this sense, they emphasize the need to sensitize children to nature, showing them that they are an integral part of it—an idea aligned with Reigota's (2009) argument that Environmental Education in schools should not be limited to the transmission of information, but should function as a knowledge-building process that enables students to understand their place in the world and their interrelationship with the environment.

Reigota (2009) contends that Science teaching in the early grades plays a crucial role in the development of ecological awareness, in which children learn to view nature as a part of themselves rather than something separate or distant. The author uses the term "ecological awareness" to refer to a process of critical understanding of the relationship between individuals and the environment—one that goes beyond the mere adoption of environmentally correct behaviors. For the author, Environmental Education should enable students to recognize their belonging to nature and, from that perspective, understand the complexity of the social, economic, and political relationships that shape environmental problems. In this sense, the formation of ecological awareness, according to Reigota (2009), is not limited to the acquisition of information or the reproduction of normative attitudes; rather, it involves fostering a critical reading of the world and developing individuals capable of ethically, empathetically, and actively intervening in reality. Thus, the author situates the notion of ecological awareness within a political and contextualized framework, aligned with the principles of Critical Environmental Education, which understands the environment as a sociocultural and historically situated construct.

Sorrentino (1997), one of the leading researchers in the field of Environmental Education, argues that Environmental Education must begin with the sensitization of children, helping them to perceive themselves as part of nature rather than treating it as something external. He proposes that, rather than focusing solely on shaping the ecological citizen, the initial goal should be to awaken children's curiosity and sense of belonging to the environment, creating an emotional connection with the natural world. According to him, this initial sensitization lays the foundation for children to develop lifelong attitudes of care and environmental preservation.

The analysis of the interviews reveals that the teachers are engaged in a variety of pedagogical practices related to the environment and Environmental Education. These practices seek to integrate Science education with the goal of fostering sustainability, addressing environmental themes that help children develop a critical understanding of the world and inform their decision-making based on sustainability and the common good. However, the depth and scope of these practices vary, reflecting different levels of implementation of a consistent Environmental Education approach.

Some teachers, such as Aparecida and Vania, mentioned specific events and activities, such as Environment Week and Science Fairs, that address environmental issues in a more occasional way. While these initiatives are valuable, they tend to be episodic and may not provide ongoing integration with the school curriculum. Aparecida also described how the school organizes events like Environment Week and recycling drives, which involve isolated activities and participation in external events. Vania emphasized the importance of preserving the environment for students' futures but did not detail any continuous, day-to-day practices within the school setting.

> *Excerpt 1 – For example, during Environment Week, we have a whole week with various activities and programs. They organize lectures, and we attend and participate along with the students. We also have the Science Fair, which is a big event here at the school and is open to the entire community. The children get very excited because they will present their work to their parents and friends. I really enjoy the Science Fair and the other events as well* (Aparecida).

> *Excerpt 2 – Here at school, we have projects such as the Science Fair, lectures with professionals from the fields of nutrition and health, Environment Week, and the recycling project. In fact, right now we are collecting recycling materials, and we are working with the students to encourage them to bring materials from home so we can teach them how to sort them into the appropriate containers for each type of material* (Aparecida).

> *Excerpt 3 – Regarding environmental preservation, mainly because this concerns their future—if they do not preserve the environment now, they themselves will suffer the consequences later* (Vania).

The excerpts featuring statements from teachers Aparecida and Vania highlight the importance of practical initiatives and school events in raising students' environmental awareness. Aparecida emphasizes the relevance of projects such as the Science Fair and Environment Week, which engage not only the children but also the wider community. These events foster an environment of active and collaborative learning, where students have the opportunity to share their knowledge and experiences with their families and friends. This approach not only stimulates student enthusiasm but also strengthens the school's connection

with the community, promoting a culture of lifelong learning and social engagement while advancing scientific literacy and Environmental Education.

Vania, in turn, underscores the urgency of environmental preservation, warning that students' actions today will directly affect their own future. This concern reflects the need to cultivate conscious and responsible citizens who understand the importance of caring for the environment from an early age. Taken together, the teachers' statements suggest that Environmental Education should be a priority in the school curriculum, integrating theory with practice and preparing students to confront the environmental challenges they will face in the future. In conclusion, by implementing meaningful activities connected to students' everyday lives, schools can play a crucial role in shaping a generation that is more aware of and committed to sustainability and environmental preservation.

In this regard, Sorrentino (1997) emphasizes that educational activities conducted outside the classroom and in direct connection with the environment are fundamental to individual development, as they help foster a sense of community and enable individuals to recognize their responsibility toward the world they inhabit. However, achieving this goal presents a challenge in the current context, where society is largely driven by a capitalist mode of production that promotes consumption and prioritizes profit over sustainability. From this perspective, environmental problems should not be viewed as the sole responsibility of individuals but must also be attributed to large corporations that exploit natural resources excessively to meet the demands of capital. Therefore, discussions of Environmental Education in schools must address these structural issues, emphasizing collective responsibility and offering a critical perspective on a development model that unsustainably exploits the environment.

Dias (2004) contributes to this perspective by arguing that it is the role of Environmental Education to broaden both individual and collective perceptions of society so that both individuals and groups internalize the fundamental concepts of this field in a conscious manner and thus recognize the need to take action to promote change—actions that should not be confined to the classroom. Based on the author's reflections, it is evident that Environmental Education has significant potential to contribute to the development of critical students while fostering pedagogical practices capable of promoting the emancipation of individuals, enabling them to become agents of social transformation. Clearly, this potential depends on how Environmental Education is implemented and whether its approach is oriented toward transformative Environmental Education.

We therefore believe that Transformative Environmental Education takes place through practical experiences, outreach activities, and community-based projects in which students are encouraged to develop a sense of responsibility and commitment to natural resource preservation and social justice. This transformation aims not only to inform, but also to empower individuals to become change agents in their communities by adopting behaviors that contribute to a more sustainable and equitable future—while respecting diversity. This perspective aligns with Loureiro (2003), who asserts that to speak of Transformative Environmental Education is to affirm education as a social praxis that contributes to building a society grounded in new civilizational and societal paradigms—ones that differ from the current model—where the sustainability of life and ecological ethics lie at the core.

In this regard, teachers such as Divina and Marta reported that they strive for a more continuous and contextualized integration of environmental issues into Science education. Divina explained that she organizes visits to places such as the local landfill and the municipal water treatment plant and invites guest speakers on topics such as recycling, aiming to connect students with environmental realities in a practical and transformative way. Marta, in turn, described working with recycled materials and conducting decomposition and waste-sorting projects during the Science Fair, suggesting a more integrated and hands-on approach to Environmental Education.

> *Excerpt 4 – Sometimes I take the students to visit the square next to the school. We've also been to the landfill and the municipal water and sewage treatment plant, but these visits depend a lot on the topic we're covering and whether we can arrange transportation. It's not always easy—you have to submit a formal request to get transportation and also ask for help from the coordinators to accompany us on the visit. (…). I invited a colleague with more knowledge about the environment to speak about the importance of recycling and how we should take care of our river and forests. (…). It's very important because it helps them understand things and teaches them how to take care of our world* (Divina).

Divina's statements highlight the importance of off-campus visits and practical engagement in Science education, particularly on topics related to the environment. By mentioning field trips to locations such as the town square, the landfill, and the municipal water and sewage treatment plant, Divina emphasizes that these experiences offer contextualized learning opportunities, enabling students to observe and reflect on environmental concepts in a practical way. However, she also points to the challenges of organizing such activities, including difficulties in securing transportation and the need for support from school coordinators—factors that may hinder the regular implementation of these experiences.

Additionally, the initiative to invite a colleague with expertise in environmental issues to address the importance of recycling and natural resource conservation exemplifies how collaboration and knowledge exchange are essential for enriching students' learning experiences. This approach not only broadens students' understanding of environmental issues but also actively engages them in discussing and solving problems related to their surroundings.

Thus, Divina's account underscores the importance of integrating practical education with theoretical knowledge, creating a more comprehensive and conscious learning experience for students regarding the impact of their actions on the world. This integration of theory and practice—combined with overcoming logistical limitations—can significantly contribute to fostering more responsible and engaged citizens with regard to environmental preservation.

Divina demonstrates an integrated approach by providing practical experiences and field visits that connect students with real-world environmental issues. By involving specialists and organizing off-campus activities, she reinforces Environmental Education in a contextualized and continuous manner.

Loureiro (2019) argues that this approach is essential for fostering critical thinking in Environmental Education, recognizing that such relationships are forged through social actions. The author lists several of these actions: promoting and understanding socio-environmental problems by viewing the environment as a network of interrelationships (between the natural and social worlds);

contributing through fairer, more sustainable, and more compassionate actions toward life and nature; fostering ecological attitudes that are sensitive to environmental issues; utilizing education to propose solutions or mitigate problems through teaching and learning; promoting daily school practices that involve inquiry and learning situations aimed at conflict/problem resolution to better connect school with society; building processes of meaningful learning; and guiding educators as mediators of socio-educational relationships so that they can foster innovative processes of social learning (Loureiro, 2019).

Therefore, in order to be implemented with students, transformative education should:

> Methodologically be carried out by articulating formal and non-formal educational spaces; by bringing the school closer to the community it serves; by integrating curricular and extracurricular activities into a cohesive plan; by building the political-pedagogical project collectively and democratically; and by linking cognitive activities to efforts that improve the objective living conditions of students and the broader community (Loureiro, 2004, pp. 72–73).

Loureiro's (2004) excerpt highlights the importance of an integrated and articulated educational approach—one that transcends the boundaries of formal educational spaces to also include non-formal spaces and community engagement. This vision expands the traditional concept of schooling, suggesting that education should be a continuous and interconnected process that takes place both inside and outside the classroom. This vision seems to align with the practices described by the teachers in this study—through visits, lived experiences, and events such as the Science Fair and Environment Week.

The articulation between formal and non-formal educational spaces is essential for creating a richer and more diverse learning environment. Non-formal spaces—such as extracurricular activities and community projects—offer additional opportunities for students to engage with knowledge in practical and contextualized ways. This type of integration allows students to see the relevance of what they are learning within a broader and more dynamic context, connecting curricular content with real and meaningful experiences.

Bringing the school closer to the community is a crucial factor in promoting transformative Environmental Education. When the school integrates with the community it serves, it can reflect local needs and realities, making the educational process more relevant and responsive. Furthermore, this interaction fosters a sense of belonging and shared responsibility between the school and the community, creating an environment of mutual support that benefits both students and community members.

The integrated planning of curricular and extracurricular activities is another important dimension of the approach proposed by Loureiro (2019). When activities are cohesively and strategically planned, there is a greater likelihood that educational objectives will be achieved more effectively. This integration fosters a holistic approach to education, in which students have the opportunity to apply and expand upon what they learn in the classroom through practical and enriching experiences. Some of the teachers' statements reflect a concern with providing students with such practical experiences:

> *Excerpt 5 – Well, for example, we worked on this in the 'JEPP'[5] program and in the Science Fair, with projects on materials and recycled toys. We were studying waste, decomposition, and waste sorting. And here at the school, there is also a project about waste separation. (…). How will that content make a difference in their lives, or what benefits could it bring—whether short-term or long-term—for the environment or even for the economy or the municipality?* (Marta).

Marta illustrates this ongoing integration by engaging students in practical projects related to waste and recycling, while also encouraging reflection on the relevance of these topics for students' lives and the environment. Her approach seeks to connect Science content with students' everyday realities, fostering deeper and more contextualized understanding. These excerpts demonstrate how such practices aim to contribute to a more effective and integrated Environmental Education within Science teaching.

In turn, the connection between Environmental Education and student awareness is evident in several accounts. Joana and Regina discuss the importance of fostering ecological awareness and preparing students for future environmental challenges. In this regard, Joana mentions the need to explore environmental issues more deeply so that students can better understand climate changes and contribute to making the world a better place. Regina complements this perspective by emphasizing the importance of going beyond the prescribed curriculum to also address practical actions, such as saving water and raising awareness about the importance of consuming treated water:

> *Excerpt 6 – About the environment—I think there should be more opportunities to work on this, so that the kids can understand the changes happening in the world and what they can do to improve things, because it is they who will live in that world. We are already seeing that a lot is happening with the climate, for example* (Joana).

> *Excerpt 7 – Ecological awareness, for example—we are currently covering the topic of water. The material only talks about the importance of water and about water particles, but we can go further. We can talk about how to save water, the importance of drinking only treated water, and the water cycle. So, we are able to think outside the box and raise the kids' awareness* (Regina).

The excerpts from Joana and Regina reflect a shared concern regarding the need for a broader and more effective approach to teaching environmental issues, particularly among young students. Joana emphasizes that, in order for students to understand the climate transformations affecting the world, it is crucial to implement a more comprehensive form of education—one that goes beyond what is strictly defined in the curriculum. This vision is essential, as today's students are the generation that will face the consequences of environmental changes and must therefore be equipped with the knowledge and skills needed to foster positive change.

Regina complements this perspective by underscoring the importance of developing students' ecological awareness through practical and applicable topics, such as water conservation and the water cycle. She suggests that instead of limiting learning to theoretical content, educators should connect scientific concepts with concrete actions that students can adopt in their daily lives. This active approach not only makes learning more meaningful but also empowers students to become change agents within their communities—reflecting an

educational model that fosters not only knowledge, but also action and environmental responsibility.

Both excerpts highlight the importance of a dynamic and contextualized curriculum that fosters a critical and practical understanding of environmental issues. By engaging students in meaningful discussions and hands-on activities, educators can help cultivate a more conscious and responsible generation—one prepared to face future ecological challenges, as discussed by Ferreira et al. (2023). The development of ecological awareness, according to Reigota (2009), is not limited to the acquisition of information or the reproduction of normative attitudes; rather, it involves fostering a critical reading of the world and developing individuals capable of ethically, empathetically, and actively intervening in reality. In this sense, Reigota (2009) situates the concept of ecological awareness within a political and contextualized framework aligned with the principles of Critical Environmental Education, which views the environment as a sociocultural and historically situated construct.

In our view, the reflections shared by the teachers point toward this concern with building sustainable values and attitudes—fostering a critical awareness and a sense of belonging that support social transformation and active citizenship. Based on our analysis of the interviews, we interpret the teachers' vision of Environmental Education as one oriented to the development of individuals who are aware of their interdependence with nature and capable of contributing to the construction of a more just and environmentally balanced society.

The use of textbooks and complementary materials to address recycling and environmental protection was a recurring theme in the interviews. Aparecida, for example, mentioned how textbooks cover the topic of recycling and how this is complemented by school projects. Divina also highlighted the use of books to teach about the importance of caring for the planet, although this represents a more traditional and less dynamic approach.

> *Excerpt 8 – Fair, lectures with professionals in the fields of nutrition and health, Environment Week, and the recycling project. In fact, we are currently running a recycling collection program. We are working with the students, so that they bring recyclable materials from home, and we teach them how to sort them into the appropriate containers for each type of material. So, the school is running this recycling collection while also teaching the importance of recycling, and the money raised is used to purchase classroom materials. (…). The textbooks also cover recycling, so this project makes it even stronger for us to work on this topic. We are always doing activities and experiments related to it* (Aparecida)
>
> *Excerpt 9 – It's very important because it helps them understand things and teaches them how to take care of our world. (…). Their textbooks include things that help them become good people who care for the planet* (Divina).

The excerpts from Aparecida and Divina highlight concrete initiatives that the school is implementing to promote Environmental Education and raise students' awareness of sustainability. In Excerpt 8, Aparecida mentions projects such as the Science Fair, lectures, and the recycling collection program, showing how these activities are not only integrated into the curriculum but also actively engage students in practices aimed at environmental preservation. The emphasis on student participation—bringing recyclable materials from home and learning how to sort them—strengthens their practical understanding of the importance of

recycling, demonstrating how everyday actions can contribute to a positive environmental impact.

In Excerpt 9, Divina complements this perspective by emphasizing that Environmental Education, when incorporated into textbook content, helps foster conscious and responsible citizens. By connecting learning with sustainable practices and the protection of the planet, educators are not only building theoretical knowledge but also cultivating values and behaviors that encourage care for the environment. This approach is essential for preparing students not only to understand scientific concepts but also to become active agents in building a more sustainable future.

Both excerpts underscore the importance of education that goes beyond theory, engaging students in practical experiences that teach them to value and care for the world around them. These initiatives not only enrich the teaching and learning process but also help shape a generation that is more environmentally aware and engaged.

Thus, although the reported practices vary in depth and frequency, all of the teachers recognize the importance of integrating Environmental Education into Science teaching. The diversity of practices suggests a general awareness of the need to prepare students to become environmentally responsible citizens, though the implementation of these practices could be further strengthened. For more effective sustainability education, it would be beneficial to promote the continuous integration of environmental issues into the curriculum, provide teachers with adequate resources, and encourage practices that go beyond one-off activities—engaging students in long-term projects and community-based initiatives.

Loureiro (2009) supports this perspective shared by the teachers by affirming that the development of critical thinking should begin early, and that children are capable of understanding, through direct and meaningful experiences, the interdependent relationships between humans and the environment. He reinforces the idea that teaching should foster curiosity and reflection, allowing children to discover for themselves the impacts of their actions on the natural world.

The analysis of the teachers' statements reveals that both the school and the educators are committed to fostering the development of conscious and responsible citizens by implementing a variety of environmentally oriented activities—activities that go beyond isolated actions and contribute to a cross-curricular approach to Environmental Education. The teachers emphasize the importance of integrating these projects into everyday school life, providing meaningful experiences that allow students to understand and engage with the relationship between scientific knowledge and its practical implications in their daily lives.

Organizing events such as Science Fairs, hosting lectures by professionals, and implementing recycling projects demonstrates a continuous effort on the part of both the educational institution and the teachers to promote Environmental Education. These activities are not merely informative; they engage students in concrete actions, encouraging critical reflection on environmental issues and promoting sustainable practices. By working in a continuous and integrated manner, the school not only teaches the importance of environmental

preservation but also empowers students to become agents of change who are aware of the transformations taking place in the world around them.

Therefore, ensuring the continuity of these initiatives within the school is essential to fostering strong environmental awareness among students, helping them become citizens who not only understand the science behind environmental phenomena but are also willing to take action toward building a more sustainable future. This ongoing approach to Environmental Education represents a crucial step in preparing a generation that cares for the planet and actively seeks solutions to the environmental challenges we face.

Based on the analysis of the interviews with teachers from the early grades of the Rio Quente municipal school system, it is clear that there is unanimous support for integrating environmental topics into Science classes. The teachers express concern about fostering ecological awareness in children, aligning with the perspective of Critical Environmental Education, as they recognize the importance of contextualizing instruction with contemporary environmental challenges. Activities such as selective waste collection, technical visits, lectures by specialists, and recycling projects are mentioned as pedagogical strategies aimed at raising students' awareness of relevant and current environmental issues.

However, while the teachers' discourse reflects a pedagogical intent consistent with a transformative conception of Environmental Education—particularly in terms of fostering values, sustainable attitudes, and a sense of belonging to the environment—many of the actual practices remain occasional and disconnected from a broader and more continuous pedagogical project. Events such as Environment Week and the Science Fair, although valuable, do not necessarily become systematic and integrated practices throughout the school year. This characteristic suggests only a partial alignment with the principles of Critical Environmental Education, which, according to Loureiro (2009), requires the articulation of theory and practice, the critical examination of the structural causes of the socio-environmental crisis, and the formation of critical and emancipated individuals.

Another point to highlight is that although some teachers do incorporate more contextualized initiatives—such as visits to public spaces related to waste and water treatment—most practices still lack a more politicized and interdisciplinary approach, both of which are central aspects of Critical Environmental Education. Issues such as the questioning of social inequalities, the critique of the hegemonic development model, and the relationship between the environment and social justice are rarely mentioned in the teachers' statements, revealing a challenge that must be addressed in order to consolidate a truly critical and transformative approach.

Thus, it can be said that the teaching practices analyzed show significant progress in the integration of Environmental Education into the early grades of Elementary School; however, they still fluctuate between an awareness-raising approach and isolated actions, falling short—at least in part—of the political and formative intentionality that characterizes Critical Environmental Education. For this perspective to be fully realized, it is essential to invest in ongoing teacher professional development, integrated curriculum planning, and the strengthening of schools' Political-Pedagogical Projects, so that environmental actions evolve

from isolated efforts into a sustained school culture committed to sustainability, environmental justice, and the emancipation of individuals.

FINAL CONSIDERATIONS

This study revealed that teachers in the early grades of the Municipal School System of Rio Quente, Goiás, are increasingly valuing environmental topics within the context of Science teaching. The interviews revealed a diverse set of teaching practices that include school projects, fairs, guest lectures, technical visits, and activities involving recyclable materials—indicating an effort to contextualize Science teaching and make it more relevant to students' realities.

Although the initiatives described contribute to raising environmental awareness and fostering values oriented toward sustainability, most of these actions are still characterized by fragmentation and a lack of systematic integration into the school curriculum. The predominance of one-off activities and isolated events limits the educational potential of Environmental Education, distancing it from the principles of a critical approach—which calls for the articulation of theory and practice, analysis of the structural causes of the socio-environmental crisis, and the promotion of individual and collective emancipation.

Therefore, it is concluded that, despite the progress observed, the consolidation of a critical and transformative Environmental Education in the early grades of Elementary School depends on overcoming isolated practices, collectively building a continuous pedagogical project, and providing teacher training that supports this perspective. It is essential that the school functions as a space for reflection and action, strengthening its commitment to sustainability and environmental justice in order to contribute effectively to the formation of critical, ethical individuals capable of actively participating in the transformation of socio-environmental reality.

In this regard, the teachers' interpretations and pedagogical practices converge around the idea that Science education should serve as a vehicle for social and environmental transformation, preparing students to become agents of change within their communities.

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NOTES

1. Throughout this article, the term “teaching practice” is used based on a critical and transformative perspective, as outlined by Franco (2016). From this standpoint, teaching practice is conceived as a continuous praxis, grounded in an intentional and reflective posture by teachers regarding their actions, their social impact, and the transformative possibilities generated within the educational process itself. According to the author, it refers to “critical instances of educational practices, a perspective of collective transformation of the meanings and purposes of learning” (p. 543). It thus differs from conventional educational practice, which is often limited to delivering curricular content and responding to internal institutional demands, distancing itself from students’ lived experiences and broader social needs. Teaching practice, in this sense, is characterized by the teacher’s systematic and critical engagement, committed to overcoming social inequalities and building an education focused on the emancipation of individuals. Through this approach, a stance of resistance to the logic of merely programmatic education is affirmed, reinforcing the transformative role of teaching.

2. Although all participants in this study identified themselves as women, the term teacher is used throughout the text in a gender-neutral way, as is customary in English.

3. Teaching methodology, as described by the teachers, encompasses activities that guide the learning process, involving both the tools and actions employed as well as the understanding of the roles of teachers and students in this process. Among the methodologies mentioned are field lessons, experimental procedures, group debates, lectures, and the application of knowledge to everyday life, among others.

4. Based on the teachers’ statements, we understand that instructional resources refer to materials or tools that facilitate learning and can be used to implement a lesson or support broader instructional planning. Instructional resources may be digital or non-digital and can include tangible objects that students can manipulate. Examples of instructional resources include chalk, blackboards, questionnaires, exercises, books, newspapers, magazines, videos, computers, projectors, and more.

5. The ‘JEPP’ program (*Jovens Empreendedores Primeiros Passos* – Young Entrepreneurs First Steps) is an entrepreneurial education program developed by SEBRAE (Brazilian Micro and Small Business Support Service) aimed at fostering entrepreneurial skills and competencies in Elementary School students, from 1st to 9th grade of Elementary School.

REFERENCES

Adams, F. W. (2020). A percepção de professores de ciências frente aos desafios no processo de ensino e aprendizagem de alunos público alvo da educação especial. *ACTIO*, Curitiba, v. 5, n. 3, p. 1-23, set./dez. DOI: 10.3895/actio.v5n3.11519.

Aragão, P. G. de V., Dutra, H. V. G. (2017). Caminhos para a educação ambiental através da extensão e da interdisciplinaridade: a experiência do projeto tema em foco. *Ambiente e Educação* - Revista de Educação Ambiental, v. 22, n. 1, p. 275-292. DOI: https://doi.org/10.14295/ambeduc.v22i1.6494.

Baumgarten, M. G. Z., Pereira, A. L., Souza Rodrigues, H. R., Veloso, C., Dias, G. S., Lima, K. (2018). "Vamos conversar sobre a água da Ilha dos Marinheiros?": um mini -curso de educação ambiental para estudantes do ensino fundamental de uma comunidade com problemas de água potável (Rio Grande/RS). *Ambiente & Educação*: Revista de Educação Ambiental, [S. l.], v. 22, n. 2, p. 262–282. DOI: https://doi.org/10.14295/ambeduc.v22i2.6828.

Bicudo, M. A. V. (2021). A lógica da pesquisa qualitativa e os modos de procedimentos nela fundados. *Revista Pesquisa Qualitativa*, [S. l.], v. 9, n. 22, p. 540 -552. DOI: https://doi.org/10.33361/RPQ.2021.v.9.n.22.507.

Brasil (2018). Ministério da Educação. Estabelece a *Base Nacional Comum Curricular*, Brasília, DF. https://basenacionalcomum.mec.gov.br/abase/.

Brasil (1999). Lei nº 9.795, de 27 de abril de 1999. Dispõe sobre a educação ambiental, institui a *Política Nacional de Educação Ambiental* e dá outras providências. Diário Oficial da União, seção 1, p. 1.

Dias, G. F. (2004). *Educação ambiental, princípios e práticas*. São Paulo: Gaia.

Ferreira, M. H., Silveira, D. P. da; Lorenzetti, L. (2023). A Educação Ambiental no "Novo Ensino Médio": uma análise nos livros didáticos da área de Ciências da Natureza e suas Tecnologias. *Revista Sergipana de Educação Ambiental*, [S. l.], v. 10, p. 1–19. DOI: https://doi.org/10.47401/revisea.v10.19675;

Franco, M. A. S. (2016). Prática pedagógica e docência: um olhar a partir da epistemologia do conceito. *Revista Brasileira de Estudos Pedagógicos*, v. 97, n. 247, 14 dez. DOI: https://doi.org/10.1590/S2176-6681/288236353.

Fragoso, E. & Nascimento, E. C. M. (2018). A Educação Ambiental no Ensino e na Prática Escolar da Escola Estadual Cândido Mariano - Aquidauana/MS. *Ambiente & Educação*: Revista de Educação Ambiental, [S. l.], v. 23, n. 1, p. 161-184. DOI: https://doi.org/10.14295/ambeduc.v23i1.6988.

Gil, A. C. (2008). *Como elaborar projetos de pesquisa*. 4. ed. São Paulo: Atlas.

Guimarães, M. (2004) *A formação de educadores ambientais*. Campinas: Papirus.

Lenhardt, T. B. de O. (2020) *Fundamentos da Educação Ambiental*. 2. ed. Indaial: UNIASSELVI.

Loureiro, C. F. B. (2019). Questões ontológicas e metodológicas da Educação Ambiental crítica no capitalismo Contemporâneo. *Rev. Eletrônica Mestr. Educ. Ambient*. Rio Grande, v. 36, n. 1, p. 79-95, jan./abr. https://periodicos.furg.br/remea/article/view/10885.

Loureiro, C. F. B. (2009). *Trajetória e fundamentos da educação ambiental.* 3ªed. SP: Cortez.

Loureiro, C. F. B. (2004). Educação ambiental transformadora. In P. P. Layrargues (Org.), *Identidades da educação ambiental brasileira* (pp. 65 84). Brasília: Ministério do Meio Ambiente.

Loureiro, C. F. B. (2003). Premissas teóricas para uma educação ambiental transformadora. *Ambiente & Educação*. Rio Grande, v. 8, p. 37-54. https://seer.furg.br/ambeduc/article/view/897.

Melo, R. J. de. (2023). As Percepções Sobre A Formação por Alternância de Egressos da Licenciatura em Educação do Campo no Estado de Goiás. (Dissertação de Mestrado em Educação), Programa de Pós-graduação em Educação, da Faculdade de Educação da Universidade Federal de Catalão, Catalão.

Moraes, R. & Galiazzi, M. C. (2016). *Análise Textual Discursiva*. 3. ed. Ijuí: Unijuí.

Müller, T., & Silva, M. C. da. (2023). Educação Ambiental e Sustentabilidade Ambiental nos Anos Iniciais do Ensino Fundamental. *Ambiente & Educação*: Revista De Educação Ambiental, 28(1), 1–29. https://doi.org/10.14295/ambeduc.v28i1.15199.

Oliveira, T. B. & Caldeira, A. M. A. (2018). A aprendizagem baseada em problema (ABP) para o ensino da educação ambiental na formação de professores de ciências. *Revista Eletrônica da Educação*, v. 1, n. 1, p. 1 - 17. http://portal.fundacaojau.edu.br:8077/journal/index.php/revistasanteriores/article/view/267/270.

Reigota, M. *O que é Educação Ambiental*. São Paulo: Brasiliense, 2009.

Silva, A. R. da & Marcelino, V. (2022). A Análise Discursiva enquanto um cenário viável para as pesquisas qualitativas na área de Educação. *Revista Intersaberes*, [S. l.], v. 17, n. 40, p. 114 -130, 2022. DOI: https://doi.org/10.22169/revint.v17i40.2277.

Sorrentino, M. (1997). Vinte anos de Tbilisi, cinco da Rio 92: a Educação Ambiental no Brasil. *Debates Socioambientais*, São Paulo, v. 2, n. 7, p. 3-5.

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