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ENVIRONMENTAL EDUCATION AS A FORMATIVE AXIS IN DISTANCE TEACHER TRAINING: A STUDY WITH PEDAGOGY STUDENTS FROM UFVJM UAB

A EDUCAÇÃO AMBIENTAL COMO EIXO FORMATIVO NA FORMAÇÃO DOCENTE A DISTÂNCIA: UM ESTUDO COM ESTUDANTES DE PEDAGOGIA DA UFVJM UAB

LA EDUCACIÓN AMBIENTAL COMO EJE FORMATIVO EN LA FORMACIÓN DOCENTE A DISTANCIA: UN ESTUDIO CON ESTUDIANTES DE PEDAGOGÍA DE LA UFVJM UAB

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ABSTRACT: Distance Education (EaD), developed within the UAB System (Decree No. 5,800/2006), is strategic for democratizing higher education and reducing inequalities in Brazil. This study analyzed the role of Environmental Education (EE) in teacher training within the distance-learning Pedagogy program at UFVJM. The exploratory and descriptive research, with a qualitative approach, involved 419 eighth-semester students across 14 support centers. Questionnaires with open and closed-ended questions were applied to collect qualitative and quantitative data. Data analysis followed three phases: pre-analysis, material exploration, and results processing with interpretation. Findings show that although students recognize EE as an essential component, structural and pedagogical limitations persist, such as reduced workload, limited bibliography, and few practical activities. The challenges do not stem from the distance-learning modality itself but from gaps in technological infrastructure, insufficient tutor training, and the absence of practical projects and alumni follow-up, which hinder the development of a critical and transformative EE.

KEYWORDS: UAB. Distance Learning. Environment. Teacher Training.

RESUMO: A Educação a Distância (EaD), desenvolvida no âmbito do Sistema UAB (Decreto nº 5.800/2006), é estratégica para democratizar o ensino superior e reduzir desigualdades no Brasil. Este estudo analisou o papel da Educação Ambiental (EA) na formação docente do curso de Pedagogia a distância da UFVJM. A pesquisa, exploratória e descritiva, com abordagem qualitativa, envolveu 419 estudantes do 8º período, distribuídos em 14 polos. Aplicaram-se questionários com perguntas abertas e fechadas para obter dados qualitativos e quantitativos. A análise seguiu três fases: pré-análise, exploração do material e tratamento dos resultados. Os achados revelam que, embora os estudantes reconheçam a EA como eixo essencial, persistem limitações estruturais e pedagógicas, como carga horária reduzida, bibliografia restrita e poucas atividades práticas. Os desafios não decorrem da modalidade EaD, mas de lacunas na infraestrutura tecnológica, formação insuficiente de tutores e ausência de projetos práticos e acompanhamento de egressos, dificultando uma EA crítica e transformadora.

PALAVRAS-CHAVE: UAB. EaD. Meio ambiente. Formação docente.

RESUMEN: La Educación a Distancia (EaD), desarrollada en el ámbito del Sistema UAB (Decreto n.º 5.800/2006), es estratégica para democratizar la educación superior y reducir desigualdades en Brasil. Este estudio analizó el papel de la Educación Ambiental (EA) en la formación docente del curso de Pedagogía a distancia de la UFVJM. La investigación, exploratoria y descriptiva, con enfoque cualitativo, involucró a 419 estudiantes del octavo período, distribuidos en 14 polos. Se aplicaron cuestionarios con preguntas abiertas y cerradas para obtener datos cualitativos y cuantitativos. El análisis se realizó en tres fases: preanálisis, exploración del material y tratamiento de los resultados. Los hallazgos muestran que, aunque los estudiantes reconocen la EA como eje esencial, persisten limitaciones estructurales y pedagógicas, como carga horaria reducida, bibliografía restringida y pocas actividades prácticas. Los desafíos no derivan de la modalidad EaD, sino de deficiencias en infraestructura tecnológica, formación de tutores y ausencia de proyectos prácticos y seguimiento de egresados, lo que dificulta una EA crítica y transformadora.

KEYWORDS: UAB. Educación a Distancia. Medio Ambiente. Formación del Profesorado.

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INTRODUCTION

Distance Education (DE) has emerged as an essential modality for democratizing access to higher education in Brazil. Within this context, the Open University of Brazil (UAB) Program plays a strategic role by connecting public higher education institutions to serve populations that have historically lacked access to university studies. In doing so, it seeks to reduce asymmetries and expand high-quality education to regions outside major urban centers. The UAB Program¹ (Capes, 2025) aims to support individuals from diverse socioeconomic backgrounds in overcoming geographic and time-related barriers through the use of information and communication technologies, thereby promoting inclusive and accessible education. As stated by Fava (2014, p. 202), by using “information and communication technologies, [it has the potential to overcome] obstacles of time and space, making knowledge accessible, available, and attainable at any time, in any place.”

The Pedagogy degree offered through UAB stands out as one of the most widely available programs. In 2019, enrollments in distance Pedagogy programs exceeded those in on-site programs in Brazil, reinforcing the relevance of DE in broadening access to higher education. This trend intersects with the fact that the state of Minas Gerais hosts the largest number of UAB distance learning centers—58 in total—and that the Federal University of the Jequitinhonha and Mucuri Valleys (UFVJM) is the primary partner institution in most of them, positioning it as the focal institution for this study.

Since 2011, UFVJM, through the Directorate of Open and Distance Education (DEAD), has established itself as a reference in DE offerings, maintaining 14 Pedagogy learning centers across Minas Gerais (UFVJM, 2018). The institution holds strategic relevance for serving historically vulnerable regions, particularly the Jequitinhonha and Mucuri Valleys.

The Jequitinhonha Valley, located in northeastern Minas Gerais, is marked by stark contrasts between socioeconomic vulnerability and rich cultural heritage. Comprising 55 municipalities and inhabited by quilombola, Indigenous, and traditional communities, the region preserves cultural expressions such as ceramics, embroidery, weaving, music, and oral literature. With an estimated population of 25,474 inhabitants and a density of 7.3 inhabitants per square kilometer (IBGE, 2025), the territory faces significant challenges in accessing in-person education, making DE an essential strategy for democratizing higher education and strengthening teacher training aligned with local realities.

The region also presents relevant environmental characteristics. The Jequitinhonha Valley is defined by the river that gives it its name and by rich ecosystems requiring sustainable

1 The UAB System has been operating for nearly two decades throughout the country, with 1,050 centers and courses offered by 151 higher education institutions. There are more than 170,000 students enrolled. Available at: <https://www.gov.br/capes/pt-br/assuntos/noticias/com-179-mil-matriculados-uab-completa-19-anos>. Accessed on: July 12, 2025.

practices for the conservation and responsible use of natural resources. In parallel, the Mucuri Valley (Fernandes, 2013)², shaped by the Mucuri River, comprises key cities such as Nanuque—known for precious stones—and Teófilo Otoni, noted for livestock and agriculture. Covering approximately 20,080 km², the region had an estimated population of 370,000 inhabitants according to the IBGE (2010) (Fernandes, 2013).

The relevance of this research lies in the expansion of DE in Pedagogy within the UAB System and in the need to understand how Environmental Education (EE), legally defined as a cross-cutting axis, has been effectively incorporated into the Pedagogy program at UFVJM. Investigating students' perceptions is essential for assessing the quality of the training offered. The study seeks to fill existing gaps, produce an updated diagnosis of the presence of EE in distance Pedagogy programs, and identify pathways to strengthen a critical, context-driven, and environmentally responsible teacher education.

MATERIALS AND METHODS

The investigation was supported by a bibliographic review of specialized literature and the legislative framework related to EE, complemented by documentary research using content analysis techniques (Sampaio & Lycarício, 2021). This technique, based on Bardin (2011), enables a systematic and critical examination of textual data and is structured into three main stages.

In the stage of data treatment and interpretation, the analysis went beyond synthesizing categories by generating inferences capable of clarifying the research problem. The methodology, inspired by Bardin (2011), was applied concretely to the empirical material to understand how EE is—or is not—embedded in the training processes mediated by UAB. The questionnaires, composed of open and closed questions, yielded qualitative and quantitative data, broadening the understanding of the phenomenon by integrating numerical indicators and participants' subjective perceptions. Prior to data collection, Institutional Consent was obtained from the UAB/UFVJM Program, along with Ethics Committee approval under protocol CAAE nº 77793424.0.0000.5383. The questionnaires were sent to 419 Pedagogy DE students (192 senior students and 227 newcomers), and only responses from participants who provided proper authorization were considered, in accordance with ethical and legal requirements.

2 A mesoregion located in eastern Minas Gerais comprising 23 municipalities in two microregions: Teófilo Otoni (part of the Vale do Mucuri mesoregion, divided into 13 municipalities: a) Ataléia; b) Catuji; c) Franciscópolis; d) Frei Gaspar; e) Itaipé; f) Ladainha; g) Malacacheta; h) Novo Oriente de Minas; i) Ouro Verde de Minas; j) Pavão; k) Poté; l) Setubinha; m) Teófilo Otoni) and Nanuque (belonging to the Vale do Mucuri mesoregion, divided into 10 municipalities: a) Águas Formosas; b) Bertópolis; c) Carlos Chagas; d) Crisólita; e) Fronteira dos Vales; f) Machacalis; g) Nanuque; h) Santa Helena de Minas; i) Serra dos Aimorés; j) Umbaratiba (Fernandes, 2013).

The data collection scenario revealed low participation rates, especially among students and teacher-trainers. Possible contributing factors include workload, lack of awareness of the survey, limited motivation, or difficulty accessing digital tools. Nonetheless, the data obtained—though limited in quantity—offered substantive input for qualitative reflections, enabling the identification of trends, gaps, and suggestions aligned with the study's objectives.

THEORETICAL FRAMEWORK

EE must be integrated into both in-person and distance learning, as it represents a cross-cutting and indispensable dimension of teacher education. Scholars such as Reigota (2009), Lopes and Loureiro (2022), and Layrargues (2012) emphasize that EE is not a single, unified concept; rather, multiple approaches coexist and compete, requiring conceptual clarity and critical commitment in pedagogical practice. Within the Open University of Brazil (UAB), legislation—particularly Law nº 9.795/1999 (Brasil, 1999)—is expected to ensure that EE is incorporated in an integrated, continuous, and emancipatory manner.

The development of EE stems from an international movement that began in the 1960s, marked by milestones such as *Silent Spring* (Carson, 1962), the Stockholm Conference (1972), the Tbilisi Conference (1977), and national policies such as the National Environmental Policy (Brazil, 1981). The 1992 Rio Conference broadened the discussion by introducing Agenda 21 and reinforcing the concept of sustainability. Subsequent documents—including the National Environmental Education Policy (Brasil, 1999) and its regulatory decree (Brasil, 2002)—established EE as a mandatory component at all educational levels and modalities. International and national frameworks, such as the Earth Charter (2000), Johannesburg (2002), Rio+20 (2012), the Paris Agreement (2015), as well as the LDB, PCNs, DCNs, and the BNCC, reaffirmed the centrality of socio-environmental issues, albeit with varying degrees of depth.

The UAB is a public system created to expand access to higher education, with a primary focus on training basic education teachers.

In the case of UFVJM, examining the role of the UAB requires consideration of the National Education Guidelines and Framework Law (LDBEN No. 9,394/1996), which mandates higher education degrees for all Basic Education teachers. In response to regional demands and the need to expand teacher training into underserved areas, UFVJM established the Directorate of Distance Education (DEAD) in 2011. The Directorate currently operates in 42 municipalities in northern Minas Gerais, offering undergraduate degrees, specialization programs, and continuing education through the UAB/EaD system. Among these programs, the Bachelor's Degree in Pedagogy stands out, being offered across five mesoregions of the state, reflecting an institutional policy committed to expanding access and improving education quality in the region (UFVJM, 2022).

Brief Notes on the New Decree No. 12,456 of May 19, 2025

Decree No. 12,456/2025 (Brasil, 2025a) establishes the New Distance Education Policy, prohibiting fully online programs and imposing stricter requirements for infrastructure, evaluation, and course provision. The reform responds to the rapid expansion of distance education—an increase of 232% between 2018 and 2023—and to low performance in external assessments such as the ENADE. Under the new rule, all programs must include in-person or synchronous activities: distance education degrees must assign at least 20% of their workload to in-person activities; blended courses may use up to 50% distance education; and on-campus programs must ensure at least 70% of activities take place in person. Fully online formats are prohibited for Medicine, Law, Dentistry, Nursing, and Psychology, and the offer is restricted in other health-related fields and teaching degrees. The decree also reinforces infrastructure requirements for support centers, differentiates the roles of mediators and tutors, mandates in-person assessments, and sets a limit of 70 students per instructor in live classes. Institutions have up to two years to comply, and students already enrolled maintain the right to complete their program under the original structure. In public debate, the National Health Council acknowledges the value of digital technologies but criticizes unrestricted expansion of distance learning for exacerbating inequalities (Brasil, 2025a).

RESULTS AND DISCUSSIONS

The UAB is responsible for organizing distance education programs in partnership with public universities and federal institutes, negotiating physical infrastructure and human resources with municipal entities.

Discussing the UAB at UFVJM means considering the LDBEN (Brasil, 1996), which requires all Basic Education teachers to hold a higher education degree. Accordingly, as part of its expansion strategy, UFVJM created the DEAD in 2011, which now operates in 42 municipalities in northern Minas Gerais, offering undergraduate, specialization, and continuing education programs through the UAB/EaD system. The Pedagogy degree program, offered across five mesoregions of the state, stands out as a central initiative. This teacher-training policy demonstrates a commitment to broadening educational opportunities and improving education quality in the region (UFVJM, 2011).

As part of the investigation into the implementation of EE in the Pedagogy EaD/UAB/UFVJM program, questionnaires were administered to students in the academic community.

Thus, although the partial response rate limits statistical representativeness—especially regarding the student population—it does not invalidate the analysis. The results should

be interpreted as indicative, highlighting trends, demands, and weaknesses that warrant deeper examination in future studies.

Profile and Perceptions of Environmental Education

Sociodemographic data from students in the Pedagogy EaD/UAB/UFVJM program show that 89.7% are women, confirming the predominance of women in teacher education. Regarding age, 38.2% fall between 31 and 40 years old, and 36.8% between 20 and 30 years old, indicating a predominantly adult profile, with a significant presence of young adults and individuals seeking professional retraining.

In terms of self-declared race/color, 63.2% identify as mixed-race (pardo), 20.6% as white, and 13.2% as Black. This means that the majority—76.4%—are Black (Black and mixed-race). This reinforces the role of the UAB as a public policy that reaches, above all, women and Black populations, demonstrating its contribution to expanding racial and gender inclusion in higher education.

The participating students are distributed across the centers of Buritizeiro, Brasília de Minas, Francisco Sá, São João da Ponte, Cristália, Capelinha, Itamarandiba, and Minas Novas.

Regarding professional expectations, most students express interest in both teaching and working in other areas of Pedagogy—around 70% indicate such expectations. As for family composition, most live in households with two (31%) or three people (30%), and only 11% live alone.

The analysis of student distribution across learning centers shows significant variation, with Cristália concentrating nearly 30% of students, followed by Itamarandiba (about 22%) and Brasília de Minas (approximately 15%). The remaining centers—Francisco Sá, Buritizeiro, São João da Ponte, Minas Novas, and Capelinha—show lower representation, ranging from 5% to 10%. This suggests a specific regional concentration of enrollment, potentially associated with the local availability of higher education or the infrastructure of each center.

Regarding previous experience with distance undergraduate education, most students (more than 60 out of 69) did not declare or provided unclear answers. Only a small portion reported being enrolled in their first distance degree, while an even smaller group indicated having completed another program, such as History or Production Engineering. These findings suggest that the potential of distance education in the region remains underexplored.

The analysis of the collected data reveals key insights into the profile and perceptions of students enrolled in the Pedagogy program offered through the EaD/UAB/UFVJM system. Regarding motivations for pursuing distance education, professional fulfillment is the most frequently cited factor, accounting for more than 30% of responses. Other relevant motivations

include the flexibility of the distance learning format, personal fulfillment, and the need to obtain a higher education degree.

Concerning the preferred location for accessing the Virtual Learning Environment (VLE), most students reported studying primarily at home. The low number of respondents who use their workplace or other locations as study environments underscores the centrality of the home setting in the context of distance education. The data indicate that the main positive aspects of the Pedagogy EaD/UAB/UFVJM program are concentrated in the VLE, mentioned by 76.5% of respondents, followed by the support provided by distance tutors (58.8%) and the performance of the program coordination team (57.4%). Other valued elements include instructional materials, on-site tutors, and—less frequently—the infrastructure of learning centers and study groups. Although less commonly mentioned, aspects such as autonomy and a sense of support also emerged, reflecting institutional and pedagogical backing.

When asked about Environmental Education (EE), the central focus of this study, the thematic categorization of student responses enabled a clearer and more systematic understanding of their perceptions of EE within their training. The main themes identified include the importance of EE in fostering critical thinking and student awareness, as well as its role in shaping citizens committed to environmental conservation and preservation.

Even among students who have not yet completed the EE course, the topic is valued, indicating widespread recognition of its relevance. In this sense, the categorization of responses highlights the diversity of perspectives while reinforcing the strategic role of EE in training pedagogues committed to social and environmental transformation (Table 1).

Table 1

Importance of Environmental Education for teacher training and the professional practice of pedagogues

1. Importance of Environmental Education for Teacher Education
<p>"It is of paramount importance for understanding the topic and for shaping pedagogical work" (E1).</p> <p>"Environmental Education is essential both for teacher education and for pedagogical practice, as it promotes critical and informed reflection on environmental issues" (E11).</p> <p>"It is important because we are preparing ourselves to educate thoughtful and critical individuals in any context or situation" (E12).</p> <p>"Environmental Education is fundamental in teacher education, as it strengthens citizenship and respect for diversity [...]" (E28).</p> <p>"In my view, to be trained as a teacher, it is necessary to be aware of the importance of this field of education [...]" (E42).</p> <p>"It is of utmost importance that we understand the relevance of Environmental Education so we can pass this knowledge on to our future students" (E43).</p> <p>"For teacher education, it represents another important body of knowledge [...]" (E19).</p>

2. Awareness and Critical Thinking

"Raising students' awareness" (E9).

"It is essential that we develop critical thinking about this topic" (E10).

"It helps develop ecological and civic awareness" (E46).

"Environmental awareness" (E30).

"It encourages us to reflect on our daily practices and raises our awareness of the need to care for the environment [...]" (E4).

"It helps us view the world from a more sustainable perspective" (E8).

"To raise awareness about the rational use of natural resources" (E33).

"It is important for building awareness" (E20).

"More awareness. More knowledge to be shared" (E41).

"It will help us raise awareness among our future students" (E38).

3. Citizenship, Social Responsibility, and Transformative Action

"It contributes to the formation of critical and engaged citizens" (E22).

"Teaching people to live in a better society by understanding their role in consumption and in the conservation of the environment" (E35).

"The mission of the pedagogue is to encourage students to develop their critical thinking [...]" (E49).

"To help educate citizens who are aware of the need to preserve the environment in which they live" (E48).

"Environmental Education is essential for teacher education because it enables educators to become agents of change in their school communities [...]" (E7).

4. Interdisciplinarity and Pedagogical Practices

"Environmental Education allows educators to work with interdisciplinary content in a contextualized way, involving topics such as health, ethics, citizenship, conscious consumption, science, and culture" (E15).

"It provides a broader perspective and guidance on how to work with environmental themes in an integrated way across different subjects" (E44).

"It is very important because it becomes easier to teach the content in a more playful manner" (E45).

"To teach students to care for the environment and convey the importance of doing so" (E3).

"To teach students to protect the environment from pollution" (E27).

"It contributes to recognizing the importance of designing lessons that raise students' awareness [...]" (E47).

5. Personal Development and Knowledge

"We acquire more knowledge" (E29).

"It adds background and knowledge on the topics for better preparation" (E34).

"Very positive for our training" (E23).

"It is very important to have the knowledge necessary to better pass it on to our students" (E39).

"Extremely important" (E36).

"Very important" (E17, E18).

"Enrichment and awareness regarding the environment" (E52).

6. Values, Ethics, and the Relationship with Nature

"The importance of contributing to the care of ourselves and the environment" (E5).

"It is important for shaping students' understanding of this topic and of its impacts on their lives and on society" (E24).

"Environmental education is important because it concerns learning, and all learning in the classroom is essential" (E21).

"Environmental Education is important for teacher education because it creates teaching methods that promote a more informed citizenship [...]" (E14).

"It makes us aware of and up to date on the need for preventive and corrective methods, as well as strategies to avoid many disasters [...]" (E16).

7. Critical and In-Depth Perspectives (Broad and Reflective)

"Environmental Education allows us to rethink the role of the teacher and social practices [...]" (E37).

"In my view, Environmental Education is fundamental for teacher education and for the work of the pedagogue [...]" (E32).

"Environmental Education is an essential process that aims to raise awareness and empower individuals for environmental preservation [...]" (E50).

"It contributes to the formation of teachers who mediate and engage with students on environmental issues [...]" (E53).

Note. Prepared by the authors based on research data (2025).

Most students recognize the existence of one or more courses addressing EE within the program, with particular emphasis on the course Education, Society, and Environment – EADMAT072. However, a considerable portion of participants reported not knowing or preferred not to answer, which may indicate the need for clearer curricular communication or a more visible approach to EE throughout the program.

When asked whether the Pedagogy EaD/UAB/UFVJM program offered any course dedicated to EE, the data show a positive perception of the discipline's contribution, with more than 70% responding affirmatively. At the same time, the results reveal a gap in experience among students who have not yet taken the course component, which is expected given the different stages of progression within the program.

Although the discipline is widely recognized as relevant, respondents who selected "Yes" were directed to the subsequent question regarding the course's workload. A point of attention emerges: signs of dissatisfaction with the number of hours allocated to the topic, suggesting the need to expand EE coverage within the curriculum. Such expansion may occur through deepening the content of the course itself or through strengthened complementary strategies, such as extracurricular activities, integrative projects, and interdisciplinary pedagogical practices.

The high rate of responses such as "Prefer not to declare" regarding the workload may indicate uncertainty about making evaluative judgments or a lack of clarity about the assessment parameters of their own training.

The course *Principles and Methods of Natural Sciences II* is recognized by many as an opportunity to integrate EE content into teacher education, though perceptions vary. The significant number of “Yes” responses indicates that the discipline is valued by part of the student body. However, the considerable volume of “Prefer not to declare” or “I have not taken it yet” responses points to possible unfamiliarity or limited visibility of EE within the curriculum.

Participants who responded affirmatively were directed to the subsequent question about the course’s workload. Most students (45.6%) acknowledge that the course contributes to their learning about EE, but a significant portion does not perceive this relationship (22.1%) or preferred not to express an opinion (32.4%). This may indicate that the workload and approach to EE need to be clearer and more accessible to students. Overall, the vast majority of students recognize the discipline as relevant for EE training, with 47.1% evaluating both its content and its workload positively.

However, a significant contingent of 23.5% considers the workload insufficient, revealing a critical point for pedagogical review: the need to deepen the approach to EE within the curriculum, whether by expanding the workload or by offering complementary projects, integrative activities, or interdisciplinary practices. Additionally, 20.6% of respondents were unable to assess the course because they had not yet taken it, which underscores the importance of considering students’ stage of progression when interpreting these data.

Regarding the EE theme and whether the Pedagogy EaD/UAB/UFVJM program helped create or strengthen environmental awareness, the data reveal a predominantly positive trend. This suggests that the program has contributed to the internalization of values and practices related to EE, even considering the nature of distance education. The presence of blank responses or refusals to answer also indicates the need to deepen the qualitative understanding of how this awareness is constructed and perceived in the context of teaching practice.

An open-ended question was presented to the student group: *What was your perception of Environmental Education before entering the Pedagogy EaD/UFVJM program? If you prefer not to answer this question, please write “Prefer not to declare”*. The students’ statements regarding their perceptions of EE before joining the Pedagogy EaD/UAB/UFVJM program reveal a wide range of understandings, expectations, and previous experiences. Many reports indicate that there was already some prior environmental awareness, generally focused on practical actions such as nature preservation, recycling, and sustainable daily habits.

On the other hand, some students express a broader perspective, linking EE to citizenship, social engagement, and the construction of a more just and sustainable society. Expressions of surprise about the transversal nature of the topic within the curriculum are also common, as well as acknowledgment that the program expanded and deepened their initial perceptions.

Below are some of these statements:

The course promoted a shallow discussion of the topic, without significant depth (E1).

I was already aware of the severity of the environmental situation caused by human actions; the course simply added to my knowledge (E2).

The environment did not matter much to me, perhaps because I live in an area with abundant vegetation. But I realized that, even so, it is essential to know how to coexist properly with the environment to prevent its degradation, regardless of where we are (E3).

My view was similar to what was presented in the course, but I held a more closed mindset about the topic (E4).

Caring for the environment is everyone's responsibility. We must teach this from an early age so children grow up with this awareness (E5).

Before entering the Pedagogy EaD/UFVJM program, I saw Environmental Education as an approach focused on raising awareness about sustainability and preservation. I believed it helped change behaviors by encouraging practices such as recycling and resource conservation. Today, I understand that it goes further, encompassing cultural, social, and economic aspects, and that it should be integrated into all educational practices (E6).

I have always understood the importance of preserving nature (E7).

I graduated in Geography, which gave me some background on the topic. However, I still feel insecure about addressing Environmental Education in the teaching context and recognize that I need to deepen my knowledge (E8).

I believe that Environmental Education contributes to building a more conscious and environmentally responsible society (E9).

I had already been exposed to a broader approach to Environmental Education, oriented toward a sustainable society. In Brazil, I notice that this more critical concept is often confused with an education focused solely on recycling (E10).

I already had some prior knowledge about the topic (E11).

My expectation was that we would study environmental preservation practices (E12).

I have always believed in the importance of caring for the environment (E13).

I did not imagine that the topic could be addressed in so many different courses (E14).

I was already aware of the importance of environmental preservation, but the studies deepened and reinforced this perception (E15).

Although I already knew a lot about the subject, the program was essential for deepening my knowledge in a pedagogical way (E16).

I have always considered Environmental Education an important topic to be studied (E17).

I see Environmental Education as a way to reflect on human attitudes toward the environment, promoting information, awareness, and the search for collective solutions, transforming the individual into an active agent in the community (E18).

My view was limited to caring for and preserving nature (E19).

Some statements also reveal a degree of insecurity, unclear understanding, or even a lack of prior knowledge about the topic before entering the program. These varied accounts highlight not only the diversity of students' perceptions but also the program's transformative potential in fostering a critical, reflective, and interdisciplinary approach to EE.

A considerable number of students chose not to answer the question, simply writing *Prefer not to declare*.

In another open-ended question, students were asked: *In your assessment, does the Pedagogy EaD/UFVJM program help you, as a future educator, to foster the development or expansion of environmental awareness among your students?* Most responses reflect a positive perception of the program's formative capacity in this regard. Many students recognize that the courses offered, by addressing environmental issues in a transversal and interdisciplinary manner, provide theoretical and methodological foundations for implementing pedagogical practices focused on sustainability and critical awareness. Some students report transformative experiences, stating that the program broadened their own perspectives on the environment and inspired them to develop educational projects using this approach.

Below are representative excerpts from these perceptions:

It was important to show the pathways and possibilities (E1).

Yes, because it encourages us to take better care of the environment and our own well-being. It also enables us to reflect on consumerism and on our daily actions (E2).

Yes, partially (E3).

Certainly. I believe we are in constant formation and learning (E4).

Yes. Throughout the training period, the program offers courses on the subject, which help me, as a future educator, develop activities that promote students' awareness regarding care and respect for the environment (E5).

A foundation, but a shallow one, on the topic (E6).

Yes, absolutely (E7).

Without a doubt (E8).

These courses are essential to our training (E9).

To some extent, but nothing very new (E10).

Expanding students' knowledge of environmental awareness for nature protection (E11).

Yes, the Pedagogy EaD/UFVJM program can significantly contribute to enabling future educators to foster the development and expansion of environmental awareness in their students (E12).

Through an interdisciplinary approach, the program provides theoretical and practical knowledge on the importance of environmental education, equipping students to integrate these themes into the school context (E13).

The curriculum may include discussions on sustainability, socio-environmental issues, and innovative pedagogical practices that encourage students to reflect on their relationship with the environment (E14).

Additionally, by employing active methodologies and technological resources, as is common in distance education, future educators can develop creative strategies to engage students in activities that promote environmental awareness (E15).

Finally, ongoing training and the exchange of experiences with other educators and professionals in the field also enrich teaching practice, enabling educators to become agents of change in their communities. This results in an education that is more critical, aware, and committed to sustainability (E16).

Other statements emphasize the value of active methodologies, socio-environmental debates, and the articulation between theory and practice as enriching elements of teacher training. To a lesser extent, some students point to limitations in the depth of the topic or to experiences they have not yet had because they are in the early stages of their studies. These variations indicate that, although the program generally contributes to fostering environmental awareness among future educators, there remains room to expand dialogue, integrate more specific content, and strengthen the practical dimension of EE in teacher education.

One statement stood out for its argumentative richness and clarity in articulating ideas, offering a comprehensive assessment of the role of the Pedagogy EaD/UAB/UFVJM program in training future educators in EE. The response highlights not only the presence of specific courses on the topic but also the way in which content is integrated transversally into the curriculum.

The statement follows:

Yes, in my assessment, the Pedagogy Distance Education Program (EaD/UFVJM) contributes to my ability, as a future educator, to foster the development or expansion of environmental awareness among my students. The program offers courses and content that address the importance of environmental education, promoting a deeper understanding of how to integrate this theme transversally into the school curriculum. It also encourages critical reflection on socio-environmental issues and provides pedagogical methods to approach the topic with students of different age groups. In addition, it suggests methods that integrate theory and practice, supporting the

creation of educational projects that stimulate students' interest in sustainability and environmental preservation. Altogether, these aspects make me feel more prepared to engage with and inspire students in building a more robust and participatory environmental consciousness (E31).

This testimony highlights the encouragement of critical thinking, the provision of pedagogical methods suitable for different age groups, and, above all, the articulation between theory and practice, which is identified as essential for developing educational projects focused on sustainability. It reflects a mature and committed perception that demonstrates not only recognition of the role of academic training but also a personal commitment to transforming reality through critical and participatory environmental education. A consensus is observed across participants' responses: most classified environmental education (EE) as very important, while a smaller portion considered it important. Notably, none of the responses indicated that the topic is irrelevant, revealing an almost unanimous appreciation of EE within teacher education.

When asked to evaluate the statement "*Knowing official pedagogical documents (PPC, BNCC, PCN, DCN, PNEA)*³ contributes to new environmental conceptions regarding teaching theory and practice," most participants agreed. A significant share, 77.9%, fully agreed, while another 10.3% partially agreed, totaling 88.2% positive responses. This result reflects a strong perception that familiarity with EE regulatory frameworks is essential for enriching teaching practice and broadening the understanding of education's role in building a more sustainable society. Neutral or distant responses were less frequent: 5.9% *reported having no opinion*, 4.4% *preferred not to declare*, and 1.5% *partially disagreed*. These figures indicate that resistance or lack of knowledge regarding the importance of these documents is isolated among participants.

Similarly, when asked about the relevance of documents such as Agenda 21, ECO-92, and other international frameworks, responses followed the same trend. Again, 77.9% *fully agreed*, and 10.3% *partially agreed*, repeating the 88.2% rate of favorable responses. This consistency reinforces the value attributed to official documents as foundational elements in teacher education for EE. Once again, neutral or distant responses were minimal: 5.9% *reported having no opinion*, 4.4% *preferred not to declare*, and 1.5% *partially disagreed*. The small number of such responses suggests that resistance or unfamiliarity regarding the role of these documents in environmental teaching practice is highly limited among respondents. Therefore, the data highlight the need to incorporate these documents systematically into initial and continuing teacher education, aiming to promote more critical, well-grounded pedagogical practices aligned with EE principles.

3 PPC = Course Pedagogical Project; BNCC = National Common Core Curriculum; PCN = National Curriculum Parameters; DCN = National Curriculum Guidelines; PNEA = National Environmental Education Policy.

The small number of such responses suggests that resistance to, or lack of knowledge about, the role of official documents in environmental pedagogical practice is highly limited among the respondents. Thus, the data reinforce the need to incorporate these documents into both initial and continuing teacher education, with the aim of promoting a more critical, well-grounded pedagogical practice aligned with the principles of EE.

The responses indicate that most participants completely disagreed with the statement that the distance-learning Pedagogy program does not enhance work with EE. This result suggests that, for the majority of respondents, distance education does not constitute a barrier to the inclusion of environmental themes; instead, it may function as a space that strengthens transversality and interdisciplinarity, in line with the National Curriculum Guidelines for Environmental Education (CNE/CP Resolution No. 2/2012). It is noteworthy that a considerable portion of respondents acknowledged existing limitations, highlighting that EE requires pedagogical practices that extend beyond the virtual environment, such as field trips and territorial investigation activities—dimensions that are not fully feasible in distance-learning formats⁴. This tension echoes Oliveira's (2019) observation that the Open University of Brazil (UAB) operates simultaneously as a public policy and a government program, subject to budgetary constraints and structural limitations that may undermine pedagogical effectiveness.

In this context, although distance education is recognized as a tool for democratizing access to higher education (Mill, 2016; Hernandez, 2017), the data also reveal that its effectiveness in enhancing EE depends directly on how technological resources are pedagogically integrated.

Categorization of Students' Open-Ended Responses

The categorization of students' statements, summarized in Table 2, followed the steps of content analysis below:

- *Floating reading*: All responses were read in full to obtain a general understanding of the content;
- *Preliminary coding*: Keywords, recurring expressions, and relevant inferences that indicated shared meanings were identified;
- *Semantic grouping*: Responses were grouped based on convergent meanings, resulting in thematic categories;
- *Review and naming of seven (7) categories*: Categories were descriptively named to reflect the semantic content of the grouped responses.

4 Interpretation by the researcher based on the data collected.

Table 2*Categories based on students' responses*

Categories	Inclusion Criteria
Awareness and Sensitization	Focus on environmental perception, the awakening of ecological awareness, care for the environment, and everyday practices.
Critical and Reflective Formation	Emphasis on developing critical thinking, socio-environmental analysis, and shifts in teaching practice.
Curricular Integration and Interdisciplinarity	Statements that reference the integration of EE with different subjects or with coordinated pedagogical approaches.
Development of Sustainable Projects and Practices	Direct involvement in projects, school practices, and environmental pedagogical activities.
Citizenship Formation and Social Responsibility	Attribution of EE to the formation of ethical, critical, and socially responsible individuals.
Ongoing Training and Professional Development	Statements that highlight EE as a tool for continuing education, professional updating, and transformation.
Knowledge and Learning	Emphasis on acquiring knowledge, information, and content related to the environment.

Note. Author's elaboration based on the research data (2025).

Responses that did not fit clearly into any of the categories above—such as statements indicating no desire to respond or expressions of indecision—were placed in the category *Other Responses*. The data presented in Tables 3 and 4 enabled both quantitative analyses (frequency by category) and qualitative analyses (discourse examination by thematic axis). Content analysis also allows for subsequent reanalysis or refinement as new interpretive hypotheses emerge throughout the research process.

Table 3*Importance of Environmental Education (EE) for teacher education and for pedagogical practice (Single Responses)**

Participants	Responses
Category: Awareness and Sensitization	
E1	It makes us reflect on our daily practices and raises our awareness about caring for the environment; by caring for the environment, we care for others and for our own well-being.
E2	The importance of contributing to self-care and environmental care.
E3	Helps us see the world in a more sustainable way.
E4	Awareness raising among students.
E5	It raises our awareness and updates us on the need for preventive and corrective methods, as well as ways to avoid many disasters through small actions.

E6	It is important for shaping students' character; they need to learn from an early age the importance of nature.
E7	To instruct and raise students' awareness of the topic.
E8	Environmental awareness.
E9	Raising awareness about the rational use of natural resources.
E10	Helps develop ecological and civic awareness.
E11	Helps form conscious citizens who can preserve the environment in which they live.
Category: Critical and Reflective Formation	
E12	It is essential that we develop critical thinking regarding this topic.
E13	Environmental Education is fundamental both for teacher education and for pedagogical practice because it promotes critical and conscious reflection on environmental issues.
E14	It is important because we are preparing to educate individuals who think critically and reflectively in any context.
E15	Environmental Education is fundamental for teacher training, as it develops critical awareness of socio-environmental issues and promotes responsible and sustainable attitudes. For pedagogical practice, it is essential to shape transformative education capable of forming students who understand their role in environmental preservation and social justice.
E16	Environmental education enables a reassessment of the teacher's role and social practices, fostering a deeper understanding of the environment and the teacher's responsibility in addressing problems. It seeks to cultivate critical and reflective thinking in response to the patterns of degradation that humans have adopted throughout modern history. Human thought has been conditioned by its own logic, often disregarding factors essential to the continuity of natural cycles and, consequently, to the persistence of life. Recognizing that we are merely one natural phenomenon among others within a broader ecological cycle is crucial. Sustaining human life requires preserving nature in all its richness and biodiversity. Humans are part of nature; when they destroy it, they also destroy themselves. A shift is therefore needed in this entrenched, destructive mindset.
E17	Essential for the critical and active formation of educators.
E18	The role of the pedagogue is to encourage students to enhance their critical thinking, which is directly connected to Environmental Education, a theme of high relevance today, given the climate challenges that will intensify over the coming decades.
Category: Curricular Integration and Interdisciplinarity	
E19	Environmental Education allows interdisciplinary work through contextualized content involving themes such as health, ethics, citizenship, conscious consumption, science, and culture.
E20	Provides a broader view and guidance on how to work environmental themes in an integrated way with other subjects.
E21	Enables teachers in training to understand changes occurring in educational practices.

Category: Development of Projects and Sustainable Practices	
E22	Environmental Education is important for teacher training because it fosters teaching methods that promote informed citizenship. By addressing environmental issues and introducing project-based approaches, students become more engaged, and schools generate positive social impact. It is important to remember that teachers play a key role in helping students implement measures that protect the environment and improve social conditions in their communities.
E23	For teacher education, it provides an important framework, as strengthened awareness allows the development of pedagogical practices that encourage students to care for the environment as an extension of their home.
E24	Contributes to recognizing the importance of teaching practices that raise student awareness and encourage behaviors that preserve the natural environment.
Category: Citizenship Formation and Social Responsibility	
E25	Contributes to the formation of critical and engaged citizens.
E26	It is important for shaping students' understanding of the topic and its impacts on their lives and on society.
E27	It is essential, as we will be educating new generations with the awareness needed to preserve the environment and living beings.
E28	It is extremely important because it is a current and relevant theme; knowledge of it enhances pedagogical practice.
E29	Teaching students to prevent environmental pollution.
E30	Teaching individuals to live in a better society by understanding their role in consumption and environmental conservation.
Category: Continuing Education and Professional Development	
E31	Environmental Education is essential for teacher training because it equips educators to act as agents of change in their school communities. By integrating these principles into their pedagogical practice, they not only educate students about critical environmental issues but also inspire a new generation committed to protecting the planet.
E32	Environmental Education is also associated with the development of active and engaged citizenship. Educators who promote it help students develop a sense of social and environmental responsibility, preparing them to act as conscious and committed citizens.
E33	Environmental Education encourages educators to stay updated on contemporary socio-environmental issues, fostering continuous professional development—an essential requirement in a constantly changing world.
Category: Knowledge and Learning	
E34	Studying the environment is fundamental for learning about Environmental Education.
E35	We acquire more knowledge.
E36	Contributes to the acquisition of new knowledge.
E37	Adds knowledge and supports better preparation.

E38	Provides enrichment and awareness about the environment.
Category: Other Responses	
E39	I prefer not to answer.
E40	I do not know yet, as I have not taken the course.
E41	I prefer not to declare.
E42	I have not taken this course, but I believe it plays an important role in teacher education.
E43	I cannot comment yet because I have not reached this course.

*The original spelling of the participants was preserved.

Note. Prepared by the authors based on the research data (2025).

Table 4

Participants were asked to write a sentence summarizing their understanding of Environmental Education. If they did not wish to respond, they were instructed to write only: "I do not wish to state" (Single Responses)*

Participants	Responses
E1	I do not wish to state.
E2	It is very important for all humanity.
E3	Environmental education should be taught from early childhood education through the full development of the child, given its importance to society.
E4	Environmental education is essential for forming conscious citizens.
E5	I do not wish to state.
E6	Environmental education is fundamental for raising awareness about the importance of the environment.
E7	Prevention is the path to changing the current environmental scenario.
E8	Environmental Education is the key to shaping conscious and engaged citizens capable of acting in favor of sustainability and the preservation of our planet.
E9	I do not wish to state.
E10	Environmental education is an important tool for forming conscious and responsible citizens.
E11	Environmental education is an awareness that our planet is in danger; what are we doing, and what legacy are we leaving for future generations?
E12	Environmental Education is an essential formative process that raises awareness, sensitizes, and mobilizes individuals toward building a more just, sustainable society committed to the planet's future.
E13	Environmental education is a transformative tool that combines knowledge and practice, creating strong communities committed to sustainable development and well-being.
E14	Caring today will prevent disasters tomorrow.
E15	I do not wish to state.
E16	The environment in which you live says a lot about you.

E17	The environment is life; it is an extension of our home. Therefore, I must care for and preserve it for myself and for others.
E18	I do not wish to state.
E19	Environmental education is essential.
E20	Environmental education provides individuals with an understanding of the importance of preserving life through their habitat and actions within it.
E21	Care to live better.
E22	Environmental education: concerned with the environment in which we live.
E23	Environmental awareness is nature's protection.
E24	Environmental Education is an essential process that transforms knowledge and awareness of socio-environmental relations, enabling individuals to act critically and responsibly toward sustainability and collective well-being.
E25	Environmental preservation ensures the future of new generations.
E26	Talking about Environmental Education is necessary for human existence. Without environmental resources, there is no life.
E27	Environmental Education is a transformative process that seeks to raise awareness among individuals and communities about the importance of environmental preservation, promoting responsible and sustainable attitudes to ensure a balance between human development and nature conservation.
E28	I really appreciate Antônio Bispo dos Santos (Nego Bispo), and his teachings came to mind while responding to this survey. I believe they synthesize the idea well: "People in the city need to accumulate. Accumulate money, accumulate things. They are disconnected from nature; they do not feel like nature. Cities are colonial structures. Not all city dwellers are colonial peoples, but the city is a colonial territory." (A Terra dá, A Terra quer, p. 10).
E29	The world needs awareness.
E30	Environmental education, to me, is awakening each person's consciousness and responsibility to care for the planet, ensuring a fairer and more sustainable future for all.
E31	I do not wish to state.
E32	People must be made aware of the environment, as this is essential for the continuity of the human species on the planet.
E33	Environmental Education is an essential process of critical and conscious formation that enables individuals to recognize their interdependence with the environment and to act responsibly toward building a sustainable future.
E34	Environmental education contributes to changes in thinking, attitudes, and awareness.
E35	Environmental education is fundamental to building a better world.
E36	Rich is the one who knows how to have enough.
E37	In my view, environmental education contributes to the preservation of the planet and to conscious, balanced consumption, teaching through various forms of recycling and basic life-preservation practices.
E38	FUTURE
E39	Environmental education is essential for citizenship formation.

E40	Environmental awareness and education are knowledge that must be transmitted and practiced.
E41	I have nothing to say, as I have not reached this course yet.
E42	The conservation of the environment must be a continuous action, as the planet is at its limit and is calling for help. SOS to the common good continues.
E43	Every individual must acquire environmental education to prevent possible future disasters.
E44	We need to take care of our planet, because nothing is infinite, so that future generations have a place to live.
E45	Education is the starting point for awareness.
E46	Nature is crying for help.
E47	Caring for the environment is caring for life.
E48	Essential for a future full of environmental challenges.
E49	Environmental Education is fundamental for shaping critical and responsible citizens capable of preserving the environment and building a sustainable future.
E50	Environmental education is very important for environmental awareness and preservation.
E51	Preservation enriches the world.

*Original participant wording was maintained.

Note. Prepared by the author based on research data (2025).

Analysis of Systematized Responses Students

The qualitative and quantitative analysis of the systematized responses revealed a complex and engaged profile of students enrolled in the Pedagogy EaD/UAB/UFVJM program regarding the topic of EE. The responses predominantly demonstrate an expanded understanding of EE—not merely as school content, but as a transversal formative axis linked to citizenship development, critical pedagogy, and socio-environmental commitment.

The categorization of responses highlighted recurring themes such as *awareness*, *critical formation*, *civic responsibility*, and *transformative pedagogical practice*, indicating a solid appropriation of EE as formative content. Conceptual gaps and some *epistemological insecurity* were also noted, underscoring the need to strengthen EE as a transversal axis in teacher education.

The data reflect a *heterogeneous group undergoing critical maturation*, whose perceptions of EE range from common environmentalist notions to more reflective approaches. This landscape reveals the program's transformative *potential while highlighting ongoing pedagogical challenges* to fully consolidating EE within initial teacher training. The *word cloud* generated from student responses provides a visual synthesis of the most frequent concepts, emphasizing the centrality of ideas such as *awareness*, *citizenship*, and *sustainability* (Figure 1).

real living conditions. This normative change may thus reinforce structural inequalities and negatively impact democratization of access, increasing dropout among socially, economically, and territorially vulnerable populations.

Despite these limitations, the study contributes to identifying possible pathways, exposing weaknesses, and highlighting potentialities in the linkage between EE and teacher training in distance education. It is hoped that these findings will support institutional decision-making, strengthen training policies, and stimulate further research on the subject, broadening the possibilities for critical, socially situated environmental education committed to building more just and sustainable futures.

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