

TRAINING IN ENVIRONMENTAL EDUCATION AND CLIMATE EMERGENCY:  
THEORETICAL-METHODOLOGICAL CONTRIBUTIONS

*FORMAÇÃO EM EDUCAÇÃO AMBIENTAL E EMERGÊNCIA CLIMÁTICA:  
CONTRIBUIÇÕES TEÓRICO-METODOLÓGICAS*

*FORMACIÓN EN EDUCACIÓN AMBIENTAL Y EMERGENCIA CLIMÁTICA:  
CONTRIBUCIONES TEÓRICO-METODOLÓGICAS*



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**ABSTRACT:** This research is about the initial results of a research project funded by the National Council for Scientific and Technological Development (CNPq) and the Araucária Foundation. The purpose of this manuscript is to present a reflection on the alternatives found by a training course in Environmental Education and Climate Emergency in an effort to overcome some of the weaknesses identified in the approach to the Climate Emergency. It also presents the developments of this course as possibilities for the advancement of the field of Environmental Education in Brazil. Epistemologically, the course was based on a critical and complex perspective. It received 871 registrations from 24 Brazilian states, as well as participants from other countries. We believe that this research made efforts to give voice to alternatives that can contribute to the commitment of society in the face of the Climate Emergency. The knowledge produced and shared can inspire other movements for the materialization of an eco-social transition, which is fundamental for the present.

**KEYWORDS:** Complexity. Environmental Educators. Methodology. Climate Change. Project.

**RESUMO:** Esta pesquisa versa sobre os resultados iniciais de um projeto de pesquisa financiado pelo CNPq e pela Fundação Araucária. O objetivo deste manuscrito é apresentar uma reflexão sobre as alternativas encontradas por um curso de formação em Educação Ambiental e Emergência Climática ao buscar superar algumas fragilidades apontadas quanto a abordagem da Emergência Climática. Apresenta, também, os desdobramentos do referido curso como possibilidades para a avanço do campo da Educação Ambiental no Brasil. Epistemologicamente, o curso se apoiou em uma perspectiva crítica e complexa. Recebeu 871 inscrições de 24 estados brasileiros, além de participantes de outros países. Consideramos que esta pesquisa empreendeu esforços para dar voz a alternativas que possam contribuir com o engajamento da sociedade no enfrentamento da Emergência Climática. Os conhecimentos produzidos e compartilhados poderão inspirar outros movimentos para a materialização de uma transição ecossocial, fundamental para o momento contemporâneo.

**PALAVRAS-CHAVE:** Complexidade. Educadores Ambientais. Metodologia. Mudanças Climáticas.

**RESUMEN:** Esta investigación trata sobre los resultados iniciales de un proyecto de investigación financiado por el CNPq y la Fundación Araucária. El objetivo de este manuscrito es presentar una reflexión sobre las alternativas encontradas por un curso de formación en Educación Ambiental y Emergencia Climática al buscar superar algunas fragilidades señaladas en cuanto al abordaje de la Emergencia Climática. Presenta, también, los desdoblamientos del referido curso como posibilidades para el avance del campo de la Educación Ambiental en Brasil. Epistemológicamente, el curso se apoyó en una perspectiva crítica y compleja. Recibió 871 inscripciones de 24 estados brasileños, además de participantes de otros países. Consideramos que esta investigación emprendió esfuerzos para dar voz a alternativas que puedan contribuir con el compromiso de la sociedad en el enfrentamiento de la Emergencia Climática. Los conocimientos producidos y compartidos podrán inspirar otros movimientos para la materialización de una transición ecosocial, fundamental para el tiempo.

**PALABRAS CLAVE:** Cambio climático. Complejidad. Educadores Ambientales. Metodología. Proyecto.

## Introduction

This research deals with the research project “Environmental Education and Climate Crisis: a complex approach to teaching” financed by the Universal notice of the National Council for Scientific and Technological Development (CNPq) and by the Araucária Foundation (FA). Specifically, it refers to the intervention research part of the aforementioned project and which took place in the form of a course, that is, it included both the training of the participating subjects and served as an important instrument for collecting information.

It is important to mention that this study also has the support of the Municipal Environmental Council of Guarapuava (Paraná state). The investigation is proposed by the research group Environmental Education Center of the State University of the Center-West (NEA-UNICENTRO), and as partners, the Interinstitutional Network for Research in Environmental Education of Paraná (RIPEA-PR), which is made up of the following research groups: LEPEC-UENP, GEPEACS-UFPR, SEMINARE-UEM, GEPEACOM-PUC-PR, GEPAFD-CN-UTFPR, GEPEC-UEPG and NUPECAMP-TUIUTI-PR, REA-PR and REASUL, PPGEN-UNICENTRO and PPGEN- UENP.

Faced with all the socio-environmental problems that abound in world society, NEA-UNICENTRO understands based on Artaxo (2020), González-Gaudiano, Gutiérrez-Pérez and Meira-Carrea (2020), Ripple *et al.* (2021), United Nations (UN) and the Intergovernmental Panel on Climate Change (IPCC), that the Climate Emergency context is one of the greatest threats to contemporary humanity, both due to its severity and its scope. Thus, thinking about this scenario implies considering the phenomenon of climate change in its scientific, social and political dimensions, in terms of its causes, impacts and consequences.

In this context, the state of the art constructed by the IPCC (2021), in its sixth report, points out that anthropogenic interference in the Earth's climate is overwhelming and, most likely, the planet will exceed the average increase in temperature of 1.5°C predicted in the Paris Agreement in the coming decades, if quick and effective measures are not adopted by countries. Notably, extreme climate risks and impacts will be intensified, especially for groups considered historically more vulnerable to socio-environmental injustices - so well problematized by Environmental Education in its critical, emancipatory and transformative perspective over the last few decades (Maia, 2015; Loureiro, 2018).

In this sense, we could consider that humanity finds itself in an unprecedented state of Global Climate Emergency, as pointed out by the United Nations (UN). In other words, a scenario that increasingly requires the inclusion of the problem of climate change at the center

of political, academic, educational and social discussions, with a view to responding to problems with a certain degree of urgency, seeking to stop possible damage at levels of human suffering and reduce impacts on the planet (Pardellas-Santiago; Meira-Cartea, 2020).

However, despite all the seriousness that the topic imposes, authors such as Barros and Pinheiro (2013), Meira-Cartea and Arto-Blanco (2014), Iared (2017), Mesquita *et al.* (2019) and Pardellas-Santiago and Meira-Cartea (2020), point out some weaknesses in relation to the Climate Emergency approach that make it difficult to understand the genesis, impacts and alternative responses to the problem in a contextualized way. Among the weaknesses highlighted, we highlight four that are essential for (re)thinking the practices of environmental educators in their dimensions of action:

- (I) the emphasis on the scientific dimension to the detriment of political and economic dimensions, as well as their social consequences;
- (II) the population's misconceptions about this issue;
- (III) the perception of the community in general that climate change is a topic far from their reality and that, therefore, it affects them very little and there is not much that can be done about it at the individual level;
- (IV) the lack of knowledge about the complexity surrounding the topic and the sense of urgency for mitigating actions in the most varied areas.

In this sense, the need for effective training for environmental educators stands out, enabling reflection on concepts, methodologies, and even scientific knowledge, understanding the importance of choices that give characteristics to environmental educational work. Faria and Guimarães (2021) highlight the praxis of environmental educators from a critical and emancipatory perspective, which goes beyond the predominant conservative vision and practice, as fundamental to building a more sustainable relationship with the planet.

When reflecting on Environmental Education and its paths, we understand the urgency of a new training perspective, which encompasses alternative and effective ways of thinking, acting and feeling, capable of providing a basis for a pedagogical process aimed at the transdisciplinary construction of knowledge as a path to reflection on socio-environmental issues (Saheb; Rodrigues, 2023, p. 4, our translation).

Based on this understanding, the objective of this manuscript is to present a reflection on the alternatives found by a training course in Environmental Education and Climate

Emergency entitled “Environmental Education and Climate Crisis: alternatives for the ecosocial transition” within the scope of NEA-UNICENTRO actions, when seeking to overcome the weaknesses highlighted by research in Environmental Education and Climate Emergency (Barros; Pinheiro, 2013; Meira-Cartea; Arto-Blanco, 2014; Iared, 2017; Mesquita *et al.*, 2019; Pardellas-Santiago; Meira-Cartea, 2020). The aim is also to present the developments of the aforementioned course as possibilities for advancing the field of Environmental Education in Brazil in terms of approaching the topic, especially because research relating these two themes is still incipient in the country (Moser; Eichenberger, 2022).

First of all, we clarify that this text does not intend to present a ready-made recipe for how the theoretical-methodological conduct of Environmental Education work should be carried out in the context of the Climate Emergency. The reflections presented here are just some of the countless possibilities for acting on the problem through the educational process.

With this in mind, we organized this text seeking to clarify the contributions of the research-intervention stage of the larger project from which this study is based. Firstly, we make brief theoretical and methodological considerations regarding the training course. In the second moment, we present the reflections that were raised through the alternatives found by the course to overcome the weaknesses highlighted by research in Environmental Education and Climate Emergency. In the third moment, we identify some of the main developments arising from the planning and implementation of this important training process.

### **The training course: theoretical and methodological considerations**

The course was based on a critical and complex perspective of Environmental Education (Antônio; Kataoka; Neumann, 2019), as we believe that the problem in question demands the perception of the multiple dimensions that permeate the topic (scientific, political, social, individual, etc.), which contribute to a contextualized understanding of the phenomenon and, thus, have better conditions to stimulate action aimed at transformation. The course was inspired by the words of Morin (1999, p. 188) when the author states that “[...] it is at the same time about changing your life and transforming the world, revolutionizing the individual and uniting humanity”.

In this sense, this text adopts a qualitative research approach when analyzing the information produced by course participants (Minayo, 2014). Furthermore, we highlight that the aforementioned training process is understood in this text as a strategy for training

participants and, at the same time, a tool for collecting information. This investigation was submitted to the Human Research Ethics Committee of UNICENTRO and approved by opinion no. 5,675,133.

We highlight that the wide publicity for registration in the course was a determining factor in reaching the largest audience and, to this end, it had as direct supporters the Rede Paranaense de Educação Ambiental (REA-PR) and the Rede Sul Brasileira de Educação Ambiental (REA-SUL). Indirectly, it had the support of the Brazilian Environmental Education Network (RBEA).

The course was organized in a 100% free and 100% online format, in synchronous and asynchronous formats, offered through the NEA – UNICENTRO YouTube channel (<https://www.youtube.com/channel/UCxWftqmho42hQWuLdKnsBtA>) and supported by resources such as *Google Meet*, *Google Classroom* and *WhatsApp* for interaction with debaters and course participants.

*Google Meet* was the platform used to bring together the debaters and mediators of each of the meetings. The *YouTube platform* contributed to the transmission of the *live* streams, having the advantage of being reviewed at any time by the participants. Interactions, questions and trends regarding participants' misunderstandings or demands were monitored by the support team, and later addressed in subsequent lives, mainly in the podcast space, or even in the *Classroom*. Videos, articles from the debaters and weekly activities for participants were posted on *Google Classroom*. Participants posted their activities on this same platform and received *feedback* from the support team, made up of project researchers and academics. *WhatsApp* contributed to communicating general notices and relaxed interactions between participants.

The course was structured into three modules: **Module I:** Training; **Module II:** Intervention; and **Module III:** Socialization. Table 1 presents the objectives and period of completion of each of the three modules.

**Table 1 - Organization of training course modules**

<b>Modules</b>	<b>Goals</b>	<b>Period</b>
<b>Module 1</b>	The IA Module aimed to rescue the epistemological, theoretical and methodological principles of Environmental Education	Held weekly during four meetings in March 2022
	Module IB sought to present theoretical and practical subsidies in relation to the Global Climate Emergency.	Held weekly during four meetings in April 2022
<b>Module II</b>	Module II aimed to develop a pedagogical intervention proposal by the participants aimed at mitigating and/or adapting the Climate Emergency in the context of these individuals' lives.	Held during the months of May to September 2022
<b>Module III</b>	Module III aimed to socialize the experiences of the intervention and, to this end, was carried out in the city of Guarapuava (PR) in the form of a hybrid event (remote and in-person), prioritizing the participation of those interested in the themes covered during the course.	Held on November 28th and 29th, 2022

Source: Own preparation

Next, we discuss how the course sought to overcome the weaknesses presented previously, mapped in academic research in the field of Environmental Education regarding the approach to the Climate Emergency. Therefore, this manuscript focuses on explaining and describing important aspects that outlined the epistemological path that underpinned the methodological construction of training.

### **Reflections on the alternatives found by the course to overcome the weaknesses highlighted by research in Environmental Education and Climate Emergency**

To outline the issues at hand in this article, we organized this topic into four sub-items according to the weaknesses identified in the literature regarding the approach to the Climate Emergency context in educational and environmental processes.

*I- The emphasis on the scientific dimension to the detriment of its political and economic dimensions, as well as its social consequences*

Regarding the predominance of scientific approaches in relation to the Climate Emergency, Module I sought not to restrict itself to the scientific dimension linked to the topic, but to integrate the political, social and individual dimensions. Thus, we sought to highlight that the course's perspective on the Climate Emergency was that of Environmental Education, as we understand that this field has a consolidated trajectory in Brazil, which conceives the environment in its complexity, more specifically, it adopts a socio-environmental conception of the environment.

From this perspective, of the eight meetings in module I, four of them were dedicated to the field of Environmental Education. The emphasis on the educational dimension aimed to add the social dimension, as well as the political and individual dimensions to the problem. It is noteworthy that such characteristics of Environmental Education mentioned characterize the field in Brazil, showing great adherence to what has been pointed out more recently as desirable approaches when it comes to Climate Emergency, as presented by González-Gaudio, Meira-Cartea and Gutiérrez-Pérez (2020). It is worth noting that Environmental Education in our country does not have the same characteristics as in other parts of the world, where we can see a tendency towards the creation of “Education for Climate Change”.

Another aspect to be highlighted when it comes to the scientific dimension is that there are different conceptions of the authors when mentioning this dimension. One of them is based on metrics, therefore predominantly linked to Natural Sciences. The course in question, as expected, brought this dimension to the speeches of debaters such as Dr. Paulo Artaxo (USP), Dr. Luciano Farinha (UNICENTRO) and Dr. Maria Manuela Morais (UNIVERSIDADE DE ÉVORA), who discussed the data published by the IPCC related to the state of the art on the phenomenon, the contribution of forests to carbon assimilation and the interaction between the Climate Emergency and the water crisis in Europe's rivers, respectively. We highlight, however, that the course was not restricted to the perspective of Natural Sciences, but promoted a dialogue between Natural and Human Sciences, thus covering educational, social and political dimensions. The perspective of Human Sciences occurred at different moments of the course, sometimes through the foundations of Environmental Education, sometimes by focusing on specificities related to agroecology, spirituality, public policies and vulnerable communities, through the contribution of important researchers in the field, among them we highlight: Dr. Jorge Maia (UENP), Dr. Mauro Guimarães (UFRRJ), Dr. Antônio Fernando Guerra (REEDUCARE/REA-SUL), Dr. Marcos Sorrentino (UFBA), Dr. Pedro Jacobi (USP), Dr. Pablo



Ángel Meira Cartea (UNIVERSITY OF SANTIAGO DE COMPOSTELA), Dr. Maria Manuela Morais (UNIVERSITY OF ÉVORA), Dr. Paulo Artaxo (USP).

## *II – The population's misconceptions about this issue*

In relation to the erroneous information that has prevailed in the population's representations on the topic, Module IB emphasized specific aspects of climate science, a moment in which it was possible to clarify many of the erroneous aspects that have been pointed out in the literature, such as directly linking climate change the hole in the ozone layer and acid rain. However, research has shown that the Climate Emergency does not restrict the scientific dimension, and that this dimension has prevailed to the detriment of the others. In this sense, special attention was needed with this dimension. Furthermore, the current context of *Fake News* and even controversies surrounding the topic stands out, which deserve to be problematized in educational spaces.

Faced with these concerns, educators who discuss the insertion of controversies about the Climate Emergency in the classroom should be concerned about the fact that two main types of controversies coexist, according to Junges and Massoni (2018): scientific and manufactured ones. In the first case, these are controversies that, in order to be problematized, must resort to the knowledge of climate science, that is, it is the researchers in this field who have the necessary expertise to deal with doubts and outline more assertive paths. Scientists from the Humanities and Social Sciences can also contribute, especially with regard to impacts and alternatives to face the problem. In the second case, these are controversies produced by skeptical or climate-denying groups (Mendonça, 2021), which serve the interests of specific sectors that benefit from economic activities with a large contribution from greenhouse gas emissions.

In other words, when working with the topic from the perspective of controversies, environmental educators need to be concerned with an approach in line with the history of climate science and clearly present which controversies are viable to be addressed during their educational action. On the contrary, they will be incurring errors, misunderstandings and empty debates, which have already been refuted by science (Junges; Massoni, 2018).

*III - The perception of the community in general that climate change is a topic far from their reality and that, therefore, it affects them very little and there is not much to be done about it at the individual level*

Regarding the weaknesses related to the lack of perception that the topic is close to everyone's daily life, the course sought to reach as many people as possible and, to this end, strategies were created to facilitate participation. In addition to interaction on YouTube *chat* and *Google Classroom*, a *Podcast* was provided at the end of each meeting. This was a very interesting strategy for correlating what the debaters discussed and the doubts, anxieties and difficulty in correlating the depth of the discussions and the daily lives of the participants. Many of the speeches in the *Podcast* prioritized individual feasible examples of mitigating the climate emergency, such as: food, consumerism, transport, urban green areas, among others.

Furthermore, the written intervention proposal delivered at the end of Module IB and developed during Module II also played an important role in bringing the problem closer to the participants' daily lives, as they had to identify the problem in their life contexts and plan an intervention capable of responding to local problems without losing sight of the global dimension.

We emphasize that the preparatory discussions for Module II-Intervention took place mainly in the *Podcast*, which sought to problematize the daily lives of the participants, relating it to the speeches of the invited debaters. One of the highlights of this discussion on the *Podcast* happened when five course participants were invited to talk about their ideas for proposals for intervention. So, this invitation encouraged participants to reflect on the data and theories presented in Module I, as well as the relationship with their reality, and more, the understanding that they could, in a certain way, intervene in it.

*IV - Lack of knowledge about the complexity surrounding the topic and the sense of urgency for mitigating actions in the most varied areas*

Another aspect highlighted refers to the sense of urgency and gravity in relation to the Climate Emergency, which requires actions aimed at changes, whether individual or collective, related to transformations in lifestyle, eating habits, transportation, consumption or in more organized collective actions such as within the scope of public policies. Aimed at this intention, Module II-Intervention sought to address this need. To this end, participants were invited to

carry out an intervention proposal in their personal or collective life, supported by the theoretical and methodological foundations assimilated during Module I, as already mentioned.

It is worth highlighting that the intervention proposal was based on Paulo Freire's praxis, that is, on the relationship between theory and practice. Thus, while understanding the urgency of change and, therefore, action, the course excelled in supporting practice based on a theoretical foundation consistent in its first module.

### **Course developments: contributions to the field of environmental education**

We highlight that in addition to the weaknesses presented, other challenges emerged that were, in a way, covered in Module III - Socialization of the course. One of them refers to *the fragility related to the lack of materials that systematize the possibilities of approaching the topic and serve as subsidies for future actions*.

Furthermore, we can say that the intervention research (course) had a wide scope, having led not only to the discussion of the problem with quality and depth, based on climate science and social and educational dimensions, but also stimulated individual action and collective approach to confronting the problem.

The course received 871 registrations from 24 states in Brazil, in addition to participants from eight countries such as Spain, Mozambique, Mexico, Peru, Colombia, Paraguay, Uruguay and Argentina. However, in August 2023, the eight course meetings made available on the *YouTube channel* of the UNICENTRO Environmental Education and Ecology Laboratory had 7,987 views, demonstrating that the proposed training process had a greater reach, that is, it reached more interested parties, in addition to those who participated synchronously and asynchronously during the performance period.

To socialize the intervention proposals planned and developed during Module II, an international event entitled: International Meeting on Environmental Education and Climate Emergency: from reflection to action took place in a hybrid format. Therefore, the socialization of the participants' intervention experiences were organized in the form of proceedings, in digital format (<https://evento.unicentro.br/anais/criseclimatica>). This event took place on November 28th and 29th, 2022 and received 497 registrations. Although the main objective was to complete the intervention research (course), participation was also open to the general community. At this event, 73 simple summaries were presented, organized into themed rooms *via Google Meet*.

The course also included the organization of two books. The first entitled: *The field of Environmental Education in Brazil: reflections and alternatives in the context of the Global Climate Emergency*, organized the presentations of the debaters who participated in the training of the participants and listed the theoretical, epistemological and methodological bases of the field of Environmental Education and Climate Emergency. The second, called *Climate Emergency: Reflections and Environmental Education practices* prioritized the experiences of participants in the intervention planned, developed and presented during the international event.

Simple abstracts presented at the International Meeting were also selected so that they could form a thematic dossier on Climate Emergency in the Electronic Journal of the Master's in Environmental Education (REMEA), which, upon prior consultation, approved the organization of the dossier (<https://periodicos.furg.br/remea/submission/wizard?sectionId=304>).

It should be noted that the course was completed in 2022, but the research project financed by CNPq and Fundação Araucária from which this training process derived is still ongoing until 2024. Therefore, in this manuscript, the course training was treated as a methodological alternative to address the weaknesses highlighted by research in the field of Environmental Education and, in this sense, we believe that as described, to a certain extent it presented the potential to contribute to this desire initially raised, as well as to foster other important challenges for the field of Environmental Education and Climate Emergency and which can be considered in future research.

It is worth considering that the course is part of a broader research, and in it it is considered as an instrument for intervention research, since the interactions of the participants in the YouTube chats, in the Google Classroom walls, in the execution and socialization of the proposed activities, provided valuable information that will be analyzed in the future by the researchers and partners of NEA-UNICENTRO and may generate important productions aimed at strengthening the Environmental education in dialogue with the climate emergency in the country.

## Final remarks

As mentioned, the article is an excerpt from broader research, in which we focus here on the intervention research part (training course). The attention of this manuscript was directed to reflection on the course and its main results, aiming to overcome weaknesses identified as gaps in the approach to the Climate Emergency in educational spaces.

We consider that the great contribution of this text is to take diagnostic research on the topic a step further, but without neglecting its results. Therefore, this study made efforts to bring to fruition some alternatives in relation to the weaknesses highlighted in the literature, mainly pedagogical alternatives that can contribute to the engagement of communities aimed at adopting alternatives that enhance the ecosocial transition, as argued by Taibo (2019).

The different meetings of the course, distributed between Modules I, II and III, managed to articulate the multiple dimensions of the Climate Emergency. In these modules and, primarily, in Module I, misconceptions were strongly debated. The perception of the community in general that climate change is a topic far from their reality had greater emphasis in Module II, in which participants were challenged to think about actions in their contexts.

We understand that it is urgent to face the weaknesses created by the aforementioned intervention, and that the experience described here is one of the alternatives among many that can still be constructed. We also highlight that the construction of this alternative was only possible due to the mobilization of different actors, researchers, technicians, students, partners and, mainly, financial support. In addition to the participants who got involved across the country and even outside Brazil, we consider that these will be multipliers of everything that was built together during this period of approximately nine months of intervention.

The experience also materialized in productions, both with regard to theoretical/methodological subsidies on Environmental Education and the Climate Emergency, as well as possible alternatives for mitigating and/or adapting the causes and consequences of the problem. The knowledge produced and shared in the form of annals of events, books and a dossier could inspire other movements towards the materialization of an ecosocial transition, fundamental for the contemporary world.

We understand the training of educators as a *continuous development* (André, 2010) and, for this reason, as a possible weakness, we could consider that the intervention period may not have been sufficient to fully promote the training of critical and reflective educators in the face of the context of climate emergency. Furthermore, at the time we developed the training process, the population's perception was still incipient in relation to the occurrence of climate change

and their context of life. Currently, it is clear that the consequences of this phenomenon have become more frequent and intense for the Brazilian population, something that has been strengthened by the greater incidence of the subject in the mass media.

Therefore, as a prospect for future research, we understand that it is a fundamental aspect to know how society has related the climate emergency to its context of life, as well as its willingness to implement changes to face the problem through mitigation and adaptation measures that were explored during the course.

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