

Monograph: Environmental education, culture of sustainability and climate emergency

Introduction

The climate emergency is one of the main exponents of the socio-environmental crises that we have suffered since the Industrial Revolution. Such emergency place us before a new era characterized as the *anthropocene* or *capitalocene*, whose scientific evidence includes the exponential increase in the levels of greenhouse gas emissions from the fifties of the last century to the present. Faced with this exceptional situation, the culture of sustainability is offered as an essential piece for the achievement of environmentally sustainable human development, in interaction with a wide and diversified range of social, ethical, territorial and technological elements to which educational research should pay priority attention.

When we launched the call for this monograph about a year ago, we began by highlighting that the European Parliament had declared a climate emergency in November 2019 and that the Spanish Government did the same on January 21, 2020. In both cases, the objective was to achieve climate neutrality by 2050, affirming the need to align all public policies, and not only those most directly related to the energy transition and adaptation to climate change, with the objectives of the 2015 Paris Agreement.

In this perspective, all international guidelines consider that education, in all its manifestations, should play a key role in two ways. Firstly, to ensure that the seriousness and potential threat of the climate crisis is socially internalised in order to generate the necessary involvement and civic consensus to promote more ambitious mitigation and adaptation policies. And, secondly, as a cultural strategy to promote profound changes in lifestyles that significantly reduce the environmental impact they generate, in addition to facilitating the transition towards more sustainable and just ways of life, socially and environmentally.

In line with these objectives (and given the evident gap between the knowledge generated in the last five decades on the biophysical dimensions of climate change and the knowledge generated on its social and cultural dimensions), this monograph was conceived as an opportunity to modestly contribute to promoting and disseminating basic and applied educational research aimed at enhancing responses to the climate crisis from school education and the community education.

Between the announcement of this monograph and its final publication, the manifestations of the advance and potential threat of the climate crisis have multiplied. The year 2024 has been declared by the European Union and the World Meteorological Organization as the warmest year since records began. In addition, the threshold of +1.5 °C increase in average atmospheric temperature compared to the pre-industrial period has been exceeded. A milestone that climate simulation models from five years ago predicted would not be reached until the 2030s, confirming the suspicion that these models are calibrated downward. The recent phenomenon of extreme rainfall in the Spanish

Mediterranean, the devastating fires in many regions of the planet or the prolonged drought in others, are increasingly pressing reminders of the risks and dangers to which the climate crisis exposes us.

This situation, in which everything indicates that climate change will decisively condition human evolution during this century and, if not remedied, during the next millennium, forces us to do everything possible to accelerate the social and cultural changes necessary with two priority objectives: to significantly reduce greenhouse gas emissions, on the one hand, and to minimize human vulnerabilities to the impacts, many already inevitable, of climate destabilization, on the other. Given the urgency of this situation, the relatively secondary role that the climate crisis occupies in educational research agendas is surprising, as well as the evident disconnection, especially in the most developed countries, between climate policies (when they exist and are ambitious) and educational policies.

With the intention of alleviating this deficit, the set of articles that make up this monograph are fully aligned with the priority lines of the European Union's (EU) Horizon Europe framework programme for research and innovation (R+i) for the period 2021-2027. This programme revolves around three key pillars: research excellence, global challenges and innovative Europe. In the second one, "Global challenges and European industrial competitiveness", the central axis marks the cluster of thematic priorities that will cover the scientific agenda in the next seven years. Among others, there are several aspects particularly relevant to contemporary educational research, to which continuous efforts should be devoted in this period: health; culture, creativity and inclusive society; climate, energy and mobility; food, bioeconomy, natural resources, agriculture and the environment. Although if you think carefully the climate collapse articulates with all of them.

We warned when we convened this monograph that another relevant dimension for focusing educational responses to the climate crisis is the temporal one. In this regard, the UN's Intergovernmental Panel on Climate Change (IPCC) highlights in its latest reports the urgent need to leverage education, information and community approaches in order to accelerate social and cultural changes that will allow any chance of achieving the goals set in 2015, in the Paris Agreement, to limit the increase in the planet's average temperature to 1.5 °C or, as a lesser evil, to 2 °C by the end of this century. Objectives of limitation, especially the first, which now seem a chimera and whose feasibility is in the face of an evolution of global geopolitics chained to a perverse paradox: on the one hand, climate sciences are increasingly alarming and restrictive in diagnosing the seriousness of the problem and the anthropic factors that cause it, but, on the other, skeptical or climate change denial policies are expanding and gaining more and more echo in the spheres of political and economic power. Climate education and, in general, environmental education focused on the construction of fairer and more sustainable societies, suffer from this situation.

In correspondence with this reality, the monograph presented here brings together eight articles that combine research and pedagogical reflection. Together, they offer theoretical, methodological and empirical clues that aim to inspire and guide educational responses that are increasingly congruent with the magnitude of the climate crisis, with the structural nature of the social changes necessary to face it and with the urgent need to address these changes from an educational perspective to minimize the worst social and environmental scenarios of a hostile climate, whose evidences are already part of our present. The concepts *urgency* and *emergency* are a common denominator of all of them, the result of the shared conviction that it is necessary to place the climate crisis at the centre of educational research and action agendas.

The monograph begins and concludes with two panoramic articles that illustrate the breadth of approaches and the magnitude of the problems that climate education studies have focused on. Thus, they point out some of the most notable patterns, the most explored

topics and showing trends in the contemporary research agenda. The first, signed by Harumi Takano, Alicia Castillo and Pablo Meira, presents us with a critical review of the educational potential of the theory of social representations applied to climate change, marking challenges for future inquiry in the exploration of some less attended areas together with a cartography of the impact of Moscovici's theory and its explanatory potential. In the last article, Marta Segade, Antonio García, Ana Rodríguez and Júlio Conde provide us with a complete characterization of educational research on climate change in the era of climate emergency (2017-2024).

The remaining six articles delve into some of the most current lines of research. Leticia Velasco, Juan Jesús Martín and Juan Carlos Tójar analyse the assessment of participatory competences in the design of educational itineraries, taking climate change as a reference in training plans in higher education. José Antonio Caride, José Gutiérrez and Pablo Meira provide an exploratory look focused on the value of time and its implications for pedagogical research, environmental policies and climate narratives predominant in educational agendas and international reference documents with the greatest impact. Susana Sastre, Cristine Zanarotti and Marvin Josué Izaguirres provide a sample of pedagogical initiatives to promote school education for sustainability and climate action, focusing their analysis on the Community of Madrid and offering proposals for continuous improvement of these initiatives, programs and resources. M.^a Rosario Mendoza and Belén Sáenz Rico analyse the reconstruction of the identity of compulsory secondary education teachers in the different dimensions of curricular sustainability. Sara Serrate, Judit Alonso, Carmen Patino and José Manuel Muñoz review the discourses of the nature deficit in the face of the overuse of technology in childhood, from a correlational methodological approach, paying special attention to the gender dimension and analysing its influence on the sustainable identity construction of childhood. Finally, M.^a de Fátima Poza, Susana Ripoll and M.^a Teresa Pozo address the place of vocational training as a context little explored in the field of climate education. They provide guidelines to give greater prominence to this educational level in the agendas on the climate emergency, considering its outstanding value in the different professional families that connect the world of work to training areas closely linked to reality scenarios.

Taken together, the eight articles that make up the monograph provide a broad and integrative panoramic perspective on some of the trends in contemporary research in the field, identifying a representative range of relevant responses that allow the topic to be placed in a research agenda that is barely emerging, although dynamic and fertile. The evidence shown in these articles shows that their answers do not exhaust the multiple questions initially collected in the call for contributions, being rather crossed foci of *thematic flashes* that mark the path on which we must continue to build solutions to educate in a rigorous and well-founded way until they become lines of educational inquiry that will be progressively shaped over time. To the extent that contributions are increased and consolidated as stable lines of research, sufficient critical mass will be available to face the challenges of the climate emergency and the socio-ecological transition.

In light of the findings presented in the different articles and the conditions of persistence with which climate alterations manifest themselves, we can affirm that much remains to be done in the scenario of contemporary climate education. That educational options are not conclusive and require sustaining the strategic effort from an evidence-based practice. That more practical research is needed to provide sound results on the effectiveness and efficiency of interventions, resources and programmes. Consistent evaluation proposals focused on the different levels of the education system are required, which explore the demands and training needs of teachers in training and in practice and that are complemented by alliances and with the multiple socio-educational agents and agencies that operate both outside and in collaboration with the field of social education.

However, this is not enough. Integrative review studies are also necessary to show progress and build rigorous theoretical-conceptual frameworks, which help guide intervention

decisions, validate educational work methodologies, illuminate climate curricular policies and provide convincing ideas to overcome obstacles, resistance and unnecessary delays to which to take changes. The studies presented open a necessary space to continue exploring different territories and contexts, either with replication research based on some of the instruments already validated, or with proposals of greater profusion and intensity, which urgently need to be reinforced and responsibly addressed by scientific journals in the educational field. That is why we do not want to conclude this presentation without thanking the editorial board of the Spanish Journal of Pedagogy for the trust placed in it, hoping that, with these and other future contributions on climate education, the journal will honour its identity motto of promoting an “education interested in the society in which it develops”.

Pablo Ángel Meira-Carteá

Universidad de Santiago de Compostela

 <https://orcid.org/0000-0003-0194-7477>

José Gutiérrez-Pérez

Universidad de Granada

 <https://orcid.org/0000-0003-4211-9694>

Edgar J. González-Gaudio

Universidad Veracruzana de México

 <https://orcid.org/0000-0002-2161-2917>