

**YOUNG PEOPLE AND CLIMATE ACTION: EDUCATIONAL APPROACHES
PROMOTING THE COLLECTIVE DIMENSION OF YOUTH PARTICIPATION IN
CLIMATE ADAPTATION IN THEIR COMMUNITIES**

***JOVENS E AÇÃO CLIMÁTICA: ABORDAGENS EDUCATIVAS PROMOTORAS DA
DIMENSÃO COLETIVA DA PARTICIPAÇÃO JUVENIL NA ADAPTAÇÃO CLIMÁTICA
DAS SUAS COMUNIDADES***

***JUVENTUD Y ACCIÓN CLIMÁTICA: ENFOQUES EDUCATIVOS QUE PROMUEVEN
LA DIMENSIÓN COLECTIVA DE LA PARTICIPACIÓN DE LOS JÓVENES EN LA
ADAPTACIÓN CLIMÁTICA DE SUS COMUNIDADES***



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ABSTRACT: The article results from the development of a climate education project with high school students from 3 public schools in Portugal. Participatory methodologies were used to involve young people in identifying local climate problems and developing collective climate actions with their communities. The article aims to discuss the importance of these spaces in schools, so that young people can develop participation skills, debating climate solutions. The community climate profile and collaborative climate labs approaches are presented, the implementation of which was monitored using a mixed methodology in which observation notes were crossed with data from pre-test and post-test questionnaires (190 in the experimental group and 112 in the control group). The results point to the importance of collective actions between young people and the importance of peers in more sustained climate action, namely by improving young people's perceived self-efficacy. Implications are discussed as to how the participation and involvement of young people in participatory methodologies for climate action can strengthen collective agency, enhance decision-making, and promote more active environmental citizenship.

KEYWORDS: Education for environmental citizenship. Young people. Youth climate action. Participatory methodologies.

RESUMO: O artigo resulta do desenvolvimento de um projeto de educação climática com alunos do ensino médio de 3 escolas públicas em Portugal. Utilizaram-se metodologias participativas para envolver jovens na identificação de problemas climáticos locais e no desenvolvimento de ações climáticas coletivas com as suas comunidades. O artigo pretende discutir a importância destes espaços nas escolas, para que jovens possam desenvolver capacidades de participação, debatendo soluções climáticas. Apresentam-se as abordagens de perfil comunitário climático e laboratórios colaborativos climáticos, cuja implementação foi monitorizada por uma metodologia mista onde se cruzaram notas de observação com dados de questionários pré-teste e pós-teste (190 em grupo experimental e 112 em grupo de controle). Os resultados apontam para a importância das ações coletivas entre jovens e da importância dos pares numa ação climática mais sustentada, designadamente pela melhoria da autoeficácia percebida dos/as jovens. Discutem-se implicações sobre como a participação e o envolvimento de jovens em metodologias participativas para a ação climática podem reforçar a agência coletiva, ser potenciadores de tomadas de decisão e promover uma cidadania ambiental mais ativa.

PALAVRAS-CHAVE: Educação para a cidadania ambiental. Jovens. Ação climática juvenil. Metodologias participativas.

RESUMEN: *El artículo es el resultado del desarrollo de un proyecto de educación climática con estudiantes de secundaria de 3 escuelas públicas de Portugal. Se utilizaron metodologías participativas para involucrar a los jóvenes en la identificación de problemas climáticos locales y en el desarrollo de acciones climáticas colectivas con sus comunidades. El artículo pretende discutir la importancia de estos espacios en las escuelas, para que los jóvenes puedan desarrollar habilidades de participación, debatiendo soluciones climáticas. Se presentan los enfoques de elaboración de perfiles de comunidades climáticas y laboratorios colaborativos sobre el clima, cuya aplicación se supervisó mediante una metodología mixta en la que los datos de las notas de observación se cruzaron con los datos de los cuestionarios previos y posteriores (190 en el grupo experimental y 112 en el grupo de control). Los resultados apuntan a la importancia de las acciones colectivas entre los jóvenes y a la importancia de los iguales, no sólo en la adopción de comportamientos sostenibles, sino también en una acción climática más sostenida, concretamente mediante la mejora de la autoeficacia percibida por los jóvenes. Se discuten las implicaciones de cómo la participación y el compromiso de los jóvenes en metodologías participativas para la acción climática pueden reforzar la agencia colectiva, mejorar la toma de decisiones y promover una ciudadanía medioambiental más activa.*

PALABRAS CLAVE: *Educación para la ciudadanía medioambiental. Los jóvenes. Acción juvenil por el clima. Metodologías participativas.*

Introduction

This article presents a set of educational approaches to environmental citizenship and climate action that put young people in dialogue with different actors in their communities and discusses the potential of these approaches in involving young people in climate problems in their territories as a lever for climate activism. It is based on the assumption that climate education included in education for environmental citizenship (Reis, 2021) can assume a transformative nature (i) by involving young people in participatory processes of exploring climate problems in their territories, (ii) in conjunction with actors political, social, economic and activist representatives of their local communities and, (iii) generating dialogues to identify and implement actionable climate solutions.

We live daily with news about the effects of accelerated climate change and a systemic crisis of multiple and interdependent dimensions (Vilches; Gil-Pérez, 2015). However, the actions and changes that this planetary emergency demands (Club of Rome, 2019) contrast with the slowness of sociopolitical mobilization for the necessary responses, many of which are reflected in international sustainability agendas (UNGA, 2015). And, although the recognition of the climate crisis is increasingly consensual and conveyed with concern by the academic community and the media (Saheb; Rodrigues, 2023), citizen and political mobilization does not

seem to keep up with the impact of climate change and the urgent need to take action. Such a paradox of inaction (Fagan, 2023) has been explained by both structural and psychological barriers (Gifford, 2011). Furthermore, Fagan (2023) tells us about an excessive focus on a security rationality associated with the abundant production and control of information and evidence, which he proposes to be replaced by an increased focus on transformative social relations that enhance effective collective actions. Vilches and Gil-Pérez (2015) claim that one of the biggest obstacles to citizen involvement in the transition to sustainability, including in the field of education, is based on the prevalence of the idea of being an objective for the future, calling for environmental education that is reorient towards changes in the ways we relate to each other and to nature.

At the center of debates around education for climate action are, increasingly, children and young people, either because they are expected to be the generation that suffers most and will suffer from the consequences of this systemic crisis, or because it is deposited in an entire generation the hope and weight of responsibility for change for a sustainable future. However, children and young people are rarely involved in debates to formulate climate policies, which constitutes yet another factor of intergenerational injustice (Rios; Neilson; Menezes, 2021; Ursin *et al.*, 2021). Additionally, the profusion of information and news about disasters, combined with the slowness or insufficiency of the necessary responses, has generated contrasting phenomena in this generation. On the one hand, a certain alienation arises in the face of the climate crisis to the detriment of more appealing interests and more immediate concerns (Corner *et al.*, 2015). On the other hand, feelings of eco-anxiety, climate anxiety, stress and despair intensify (Corner *et al.*, 2015; Pihkala, 2020).

Among the strategies to deal with these negative feelings is the growing adherence of young people to collective climate activism movements and actions, who see their field of social influence expanded by visibility in the media in general and on social networks in particular. In joining a social collective for a common cause, young people find support to develop the ability to deal with uncertainty and environmental threats, finding a positive meaning in getting involved in pro-environmental and climate actions and measures, in what Ojala (2016) called “constructive hope”. In short, the study presented here assumes that educational approaches to promoting environmental and climate citizenship need to integrate logics of involving young people in intergenerational and intersectoral dialogues that enhance their active participation in climate policies and actions, promoting constructive hope in the expectation of creating sustainable societies with renewed relationships between all inhabitants of the Planet.

Education for environmental citizenship in the Portuguese school context

Environmental education gained expression in Portugal at the end of the 20th century, based more on environmental policies than on educational policies, with some public programs on the part of NGOs promoting environmental education in schools (Freitas, 2006). However, the international conferences that culminated in the Earth Charter and Agenda 21, approved in 2000, as well as the proclamation of the Decade of Education for Sustainable Development (2005-2014) by UNESCO, resulted in a progressive orientation of environmental education towards an education for sustainable development, where issues of citizenship and participation were gaining more and more space. Additionally, the recognition that youth activism from school enhances the connections between the school and the communities where students and their families live (Reis, 2021), has, more recently, taken schools and research educational institutions to reinforce an orientation of education towards environmental citizenship.

On the other hand, education for environmental citizenship also gains greater expression in the curricular guidelines of the Portuguese educational system through the National Strategy for Education for Citizenship (GTEC, 2017), and the fact that Environmental Education constitutes a domain of approach mandatory at all levels of education and transversally, longitudinally and in coordination with social partners (Pedroso, 2018). The development of educational approaches in schools for citizenship in this domain is currently guided by the Environmental Education Framework for Sustainability for Pre-School Education, Basic Education and Secondary Education (Pedroso, 2018), where issues of ethics and citizenship, and climate change, emerge as structuring themes in the problematization of the global environmental crisis in a school context. In this sense, an expansion has been noted in the development of school education projects for environmental citizenship (Marques; Faria; Menezes, 2018; Reis; Tinoca, 2018; Pinheiro *et al.*, 2023) where students/ are actively involved in collective actions on environmental and social problems and recognized as agents of change in their communities (CNE, 2019). However, there is still a tendency in Portugal to overvalue ecological issues to the detriment of civic issues (Schmidt; Guerra, 2013) and a certain depoliticization of the discussion of environmental problems (CNE, 2019), which justifies the proposal of projects that appeal to collective and sociopolitical actions of children and young people from school.

This article argues that mobilizing young people for participatory actions, involving them in concrete actions, can be a means of fostering hope and youth mobilization. Starting from local problems, in which students from public schools were involved in surveying the

problems of their regions, this approach recognized the agency and environmental citizenship of young people.

Educational approaches for collective and participatory climate action among young people: proposals from the ClimActiC project

ClimActiC project was developed with 23 teachers and 480 young people from classes from the 7th to the 12th years of schooling⁴ from 9 public schools in different regions of the North of Portugal, in collaboration with a team from the University of Porto. In this project, educational approaches with a community profile (Menezes; Ferreira, 2014) and collaborative climate laboratories (Pinheiro *et al.*, 2023; Malafaia *et al.*, 2023) were implemented in an articulated manner. The community profile approach, now coined as climate community profile (Pinheiro *et al.*, 2023) is a pedagogical approach inspired by community intervention strategies (Hawtin; Percy-Smith, 2007) and previously adapted for work with young people in schools (Menezes; Ferreira, 2014; Marques; Faria; Menezes, 2018). In this approach, students, with the support of their teachers, began by exploring and identifying local climate problems in their communities through pedagogical activities. Subsequently, in order to draw up the Community Climate Profile, they collected data through surveys or interviews, and also through the collection of documents and photos, to incorporate the community's knowledge in deepening the identified problems and in the search for resources and strategies to resolve them. In conjunction with this approach, Collaborative Climate Laboratories (CiCli-Labs) sessions were then organized in schools, which consisted of discussion sessions on the identified problems where students engaged in debates with actors from different sectors of the local and regional community, more precisely, representatives of local political bodies, including municipalities and inter-municipal communities⁵, representatives of economic sector entities, representatives of associations or activist movements and scientists.

These debates were promoted through a set of activities to stimulate interaction and argumentation between young people and community actors in making decisions relevant to the community management of the community's adaptation to problems caused by climate change and mitigation of the causes of these changes and were inspired by: i) UNICEF UK (2019); ii) Ribeiro (2019); Monteiro (2017); iii) Monroe *et al.* (2017); Muccione *et al.* (2019);

⁴ Corresponding to Cycle II of Elementary Education and High School in Brazil.

⁵ Intermunicipal Communities are associations of municipalities that coordinate and articulate the action of local authorities in certain territories, with specific competencies in the field of economic, social and environmental development (Law no. 75/2013, of 12 September).

iv) Lotz-Sisitka *et al.* (2006); Roche *et al.* (2020). Thus, the device i) “climate problem tree” consists of identifying and relating, in the visual representation of a tree, causes and effects of the defined climate problem; This is followed by device ii) “social climate cartography” where the local geographic distribution of the effects of the climate problem is identified with a visual cartographic representation. Then, in device iii), the “cloud of solutions” is created through a dialogue to identify actionable solutions to mitigate the climate problem. And finally, in phase iv) the “*speed climate dating*” which consists of a set of *pitch sessions* of 3-5 minutes where each representative of the local or regional community presents, alternately, to different small groups of 2 to 3 young people, the possible contributions of the entity they represent to put into practice the actionable climate solution.

CiCli-Labs’ sessions that took place in schools participating in the project lasted approximately 90 minutes per session, and in the 2022/2023 school year, 12 sessions were held, involving around 250 young people and 58 representatives of local and regional entities. As the CiCli-Labs’ activities developed, observation notes were prepared by team researchers who collaborated in organizing and observing the sessions.

Methodology

Project monitoring followed a mixed approach (Creswell, 2009), with the triangulation of quantitative data collected through a survey of student participants and qualitative data from observation notes on project activities and interviews with teachers and actors participating in CiCliLabs.

This article aims to discuss the potential of educational approaches that integrate participatory methodologies in involving young people in designing solutions to climate problems in their territories, namely by developing their sense of self-efficacy in climate action when they assume a central role in triggering collective actions. The creation of participation spaces in schools in which young people play a central role in debating actionable climate solutions for their territories, not only reinforces the work of schools in terms of citizenship education but can promote the development of agency of young people in decision-making on climate issues in which they are not always involved.

To respond to these objectives, data collected in the second year of the project was mobilized, namely through the participation of students attending high school (between the 10th

and 12th years of schooling)⁶ at 3 public schools. The selection of these 3 public schools is due to the sense of self-efficacy, which has been shown to be a powerful predictor of behavior in several areas of young people's lives (Bandura, 1997, 2005), including civic participation (Solhaug, 2006; Hope, 2016; Manganelli; Lucidi; Alivernini, 2015). Qualitative data appears in order to enrich the debate, from the perspective of argumentation and decision-making, developed by young people.

Data collection and analysis

The qualitative data results from the preparation of 5 participant observation notes, which were carried out throughout the CiCli-Labs' sessions, held in the three schools that focused on the interventions and speeches of the different participants, and considered, in a more attentive way, the involvement, argumentation and decision-making of young people.

The observation notes were subject to a content analysis (Bardin, 2011), in which we used the Nvivo ® program. It began with a floating reading, later moving on to categorization following a combination of deductive and inductive categories updated based on an analysis previously carried out on data from the first academic year of the project (Malafaia *et al.*, 2023). In this article we carry out a systematization and interpretative analysis of the references coded in the subcategory "Suggestions to increase youth climate action" that emerged under the category "Formal and non-formal education in climate action – limitations and contributions". It is intended that this content analysis reflects the senses and meanings interpreted, through the participation of young people and local actors in CiCli-Labs.

Quantitative data results from the online administration of a questionnaire survey with the main objective of understanding what students think and feel about climate change, how they participate in these matters, and how these dispositions changed after participation. In the project. A quasi-experimental design was followed, that is, the questionnaire survey was administered to the intervention and control groups, ensuring the following methodological options: i) the control groups that responded belonged to the schools participating in the project, and, the criterion was that they belonged to the same study cycle as the intervention group; ii) responded in the same time frame, that is, before the start of the intervention (January 2023) and at the end (June 2023); iii) at least one control group class per school was ensured; iv) the groups that responded (intervention and control) were the same, thus ensuring that the responses

⁶ Corresponding to Brazilian High School.

between the pre- and post-test involve the same students. The questionnaire included several scales on cognitive, attitudinal and behavioral dimensions, among which stand out questions on self-assessment of knowledge about climate change, indicators of climate anxiety, attribution of responsibilities for climate action, civic and political involvement and participation (Solhaug, 2006; Hope, 2016; Manganelli; Lucidi; Alivernini, 2015), particularly on climate issues, and self-efficacy (Bandura, 1997, 2005) in participating in climate action. We highlight in this article the dimension of the sense of self-efficacy, whose relevance in pro-environmental behavior has been accentuated (Yoong *et al.*, 2018). The sense of self-efficacy considers the extent to which respondents feel confident in their ability to understand and position themselves on certain issues and was assessed using three items, two of them focused on climate and environmental issues ('I know more about changes climate change than most people my age' and 'when environmental problems are being discussed, I usually have something to say') and a third focused on the ability to influence what happens in the city itself ('I think I can influence the that happens in my city'). The data were processed using the IBM SPSS Statistics v27 program. In order to analyze the effect of participation in the ClimActiC project, a multivariate analysis of covariance (MANCOVA) was carried out, using gender as a covariate, time and group (intervention vs. control) as independent variables.

Participants in the study

Regarding the qualitative study, table 1 summarizes the participants in the CiCli-Labs sessions for each school, in the 2022/2023 academic year.

Table 1 – Participants in CiCli-Labs in 3 Schools

School	Years of schooling	Number of sessions	Number of young students participating	Representatives of participating local and regional entities	Intermunicipal Community
A	10th and 11th year	1	43	4 (political and economic agents; scientists)	CIM Douro
B	11th and 12th year	1	39	7 (2 political agents and 2 economic agents; 1 NGO/activist representative; 1 scientist and 1 CIM representative)	CIM Cávado
C	12th year	3	35	(2 political agents and 1 economic agent; 2 representatives of NGOs /activists; 1	CIM Ave

				scientist and 2 representatives of the CIM)	
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Source: Prepared by the authors

Regarding the quantitative study, the sample consists of 302 young people, of which 190 participated in the ClimActiC project and 112 constituted the control group. The data includes 157 respondents in the pre-test and 145 in the post-test, with the administration of the questionnaires taking place in the 2022/23 academic year. The majority of participants identify themselves as girls (n=191, 64%), with ages ranging between 12 and 21 years old, with the vast majority falling between 15 and 17 years old (n =241, 81%).

Table 2 – Sample composition in the pre- and post-test

		time		Total
		preT	postT	
Please respond if you are participating in the ClimActiC project	No	54	58	112
	Yes	103	87	190
Total		157	145	302

Source: Written by the authors, using IBM SPSS v27

Presentation and Discussion of Results

The speeches in the CiCliLabs sessions (qualitative study)

The qualitative study that we bring to this article aims to highlight the importance of creating spaces to promote education for citizenship, with regard to climate change, in a school context, and how these spaces can encourage the development of collective actions that are consequently triggering decision-making by young people. Thus, the subcategory “suggestions to increase youth climate action” stands out, which is mentioned in 9 references, out of 5 observation notes, out of a total of 12.

The data we discuss below comes from participant observation notes, which allowed, throughout the debates and activities of CiCli-Labs, to understand the positioning of young people for possible decision-making, together with local *stakeholders*. Thus, at School A, the debate in which young people got involved to reach an actionable climate solution focused on the proposal of: “small *workshops* and training on water management”, aimed at “people who do not have the best resources and knowledge” (observation note from school A). Furthermore, the young people intended to mobilize themselves to travel to the nearest locations, and go to small producers, raising awareness of them for a *workshop*.

Another way to increase actionable solutions highlighted by young people consisted of proposing a “petition and a march” with the aim of being able to implement: “solar panels [that] are cheaper. And another idea was for solar panels to be mandatory in the construction of new houses.” (F. in the observation note from school B).

To this end, the young participants of this school stated the importance of the municipality creating a support office, “with technicians [...] to be able to help develop the applications, because as we don't know, our support could not be very helpful either. We don't have this information” (D. in the observation note from school B). The debate expands between this initiative with the support of the municipality and the petition initiative serving to support the implementation of solar panels, in the construction of new buildings, at national level, leading to the Assembly of the Republic.

This positioning of young people raises relevant questions for us regarding their level of participation and involvement, as active and participatory citizens, who through their knowledge, skills and attitudes are able to be an integral part of the solution through their capacity for initiative, which as we can understand In this excerpt, it also represents a process to be built with young people, in schools. Reis (2021) addresses youth activism as a crucial element for Education for Environmental Citizenship, highlighting that the participation of young people should not only be understood as an individual right, but assuming active citizenship “in their communities, sharing roles and responsibilities” (Reis, 2021, p. 1, our translation).

Finally, another way of increasing an actionable solution for young people consisted of a proposal to implement an automatic irrigation system, in the public gardens of the municipality of Escola C, to save water. During the CiCli-Labs' debate, young people understood that contributions to the implementation of this actionable solution would include:

“contribute with information, existing projects, costs and advantages in automatic irrigation systems. They also have important information about the amount of water” (R.).

“I think it is in terms of giving us information, what they do, what they can help us do, in terms of clarifying information” (M. in the 3rd observation note from school C), this in relation to Community support Intercity in the region.

What do the different actionable solutions have in common to combat local climate problems, previously identified by young people? The way in which they managed to get involved in participatory actions, contributing to debate and problem solving (Ojala, 2015). And yet, the way in which young people mobilize to create proposals for actionable climate

solutions in their territories, and, therefore, it seems relevant to us to debate changing behavior through “experience”, that is, group activities demonstrate are fundamental in promoting sustainable environmental behavior, more than information campaigns or the media themselves, as a vehicle of information (Corner *et al.*, 2015).

Corroborating what we discussed previously, it is clear that spaces for dialogue between young people and adults can effectively promote the arguments of young people and their positions regarding the need to make decisions, with regard to the creation and implementation of actionable solutions, relating to climate change.

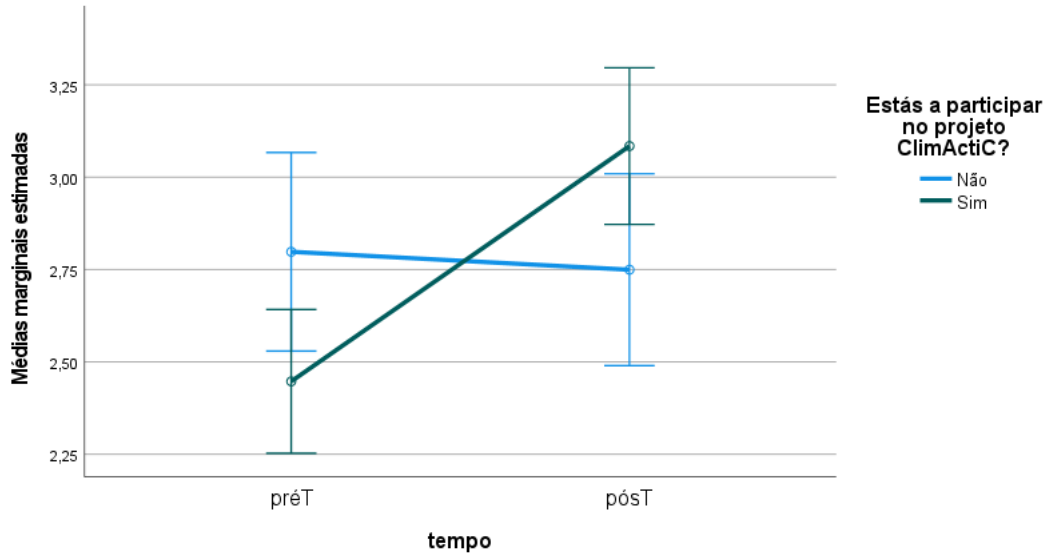
On the one hand, the literature points out that when learning about environmental problems, feelings of concern, impotence and loss of hope are generated, where young people seem to believe that the world could end due to climate change (Ojala, 2012). On the other hand, our argument in this article, and attributing relevance to this position, focuses on how participatory actions with young people can facilitate learning processes about climate change, creating opportunities for active citizenship (Blanchet-Cohen, 2008; Chawla; Flanders Cushing, 2007). It is urgent to realize that young people need to experience, through school, “opportunities for intra and interpersonal development” (Reis, 2021, p. 2, our translation), together with educational approaches to environmental citizenship so that they can trigger feelings of responsibility for their communities and environment.

Changes in the sense of self-efficacy of young participants (quantitative study)

Our objective was to test the interaction between time and participation in the project, exploring the extent to which changes occurred over time and whether this pattern of change was different depending on participation in the intervention. Multivariate tests show that there is a significant interaction [Wilks' $\lambda = 0.97$ $Z(3, 295) = 3.06$ $p = .02$], with tests of between-subject effects revealing significant differences in two items [$Z(1, 297) \geq 4.56$ $p \leq 0.05$] – it should be noted that the difference is more substantial in the item relating to self-efficacy on climate issues (Figure 1) and only residual in the item relating to influence over what happens in the city (Figure 2). However, these results suggest the effectiveness of the project in transforming self-perceptions about competence in the face of climate change and the ability to influence issues in the life of their city, which is relevant, especially if we take into account the low magnitude of these self-perceptions in the pre-test and in the control group.

Figure 1 – Self-efficacy on climate issues

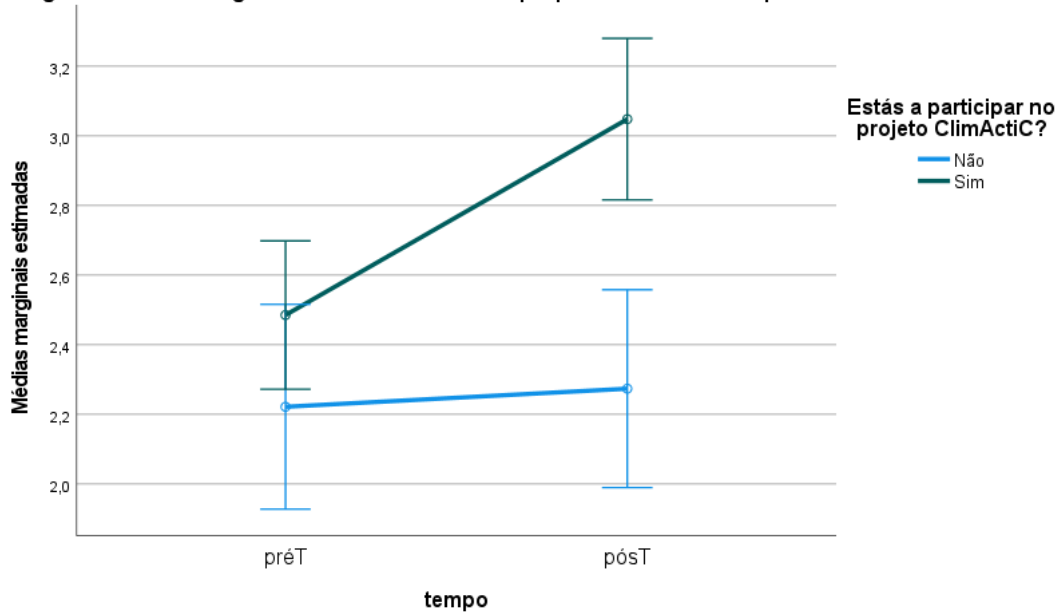
Figura 1. Médias Marginais Estimadas de "Sei mais sobre alterações climáticas do que a maioria das pessoas da minha idade".



Source: Prepared by the authors, using the IBM SPSS v27 Program

Figure 2 – Influence on what happens in the city

Figura 2. Médias Marginais Estimadas "Eu acho que posso influenciar o que acontece na minha cidade".



Source: Prepared by the authors, using the IBM SPSS v27 Program

According to the arguments of the qualitative data, the quantitative data presented here allow us to corroborate what appears to be a positive indicator of the participation and involvement of young people in their learning processes, about climate change, as a guiding

principle for the practice of active citizenship. With the quantitative data in fig. 1, it is understood that young people participating in the ClimActiC Project consider themselves to have more knowledge about climate change, compared to young people who did not participate, in the post-test. The data in fig. 2, where young people participating in the project see an increased perception of the influence they can have on what happens in their cities. These data allow, above all, to corroborate that the involvement of young people in these learning and debate processes enhances their decision-making capacity, and can trigger educational practices for environmental citizenship, responsible in their communities, as well as in the indicate the qualitative data presented in this article.

Final remarks

This article allows us to reflect on the importance of young people experiencing, from school, citizen participation in collective actions that result from processes of debate and negotiation with political and economic agents, activists, researchers and other actors in their communities.

The educational approaches proposed to promote the participation of young people in climate action, and framed in the field of education for environmental citizenship in schools, by requiring collaboration and negotiation with community members, focused more explicitly on the sphere of public policy with proposals such as, for example, the petition in the Cávado region to create conditions for citizens to have access to solar panels at more affordable prices.

Additionally, we highlight the way in which these young people got involved in actions with a more collective organizational dimension and community intervention, thus countering the usual tendency to focus on pro-environmental behaviors of individualized and depoliticized responsibility. In fact, we believe that this dimension of collective and participatory action evidenced in the proposed actionable solutions will have contributed to the positive results in terms of self-efficacy obtained with the participating students. By immediately seeing that their ideas are in fact “heard” and welcomed within the community, in addition to being materialized in concrete actions and expanded beyond the walls of their schools, students feel a greater effectiveness of the opportunities created to engage in processes of sharing and debating ideas (Solhaug, 2006; Manganelli; Lucidi; Alivernini, 2015). And since the sense of self-efficacy is a preponderant factor in determining the continued involvement in pro-environmental behaviors and attitudes (Yoong *et al.*, 2018), the opportunity for these young people to get involved, from

school, in climate action with a community dimension and politicized in the public sphere, will contribute to the sustainability of their participation in future climate actions, in addition to contributing to their individual development as participatory citizens in other spheres of action. We also believe that these dimensions of change point to a transformative potential of the educational approaches presented, in the sense of reinforcing feelings of “constructive hope” (Ojala, 2016) through involvement in collective climate action, and mitigating feelings of misinformation, impotence, ecoanxiety, climate anxiety and stress that have been associated with a certain alienation from climate issues.

REFERENCES

BANDURA, A. **Self-efficacy**: The exercise of control. New York: W. H. Freeman, 1997.

BANDURA, A. Adolescent Development from an Agentic Perspective. *In*: URDAN, T.; PAJARES, F. (ed.). **Self-Efficacy Beliefs of Adolescents**. United States of America: Information Age Publishing, 2005.

BARDIN, L. **Análise de Conteúdo**. Lisboa: Edições 70, 2011.

BLANCHET-COHEN, N. Taking a stance: child agency across the dimension of early adolescents' environmental involvement. **Environmental Education Research**, [S. l.], v. 14, n. 3, p. 257-272, 2008.

CHAWLA, L.; FLANDERS CUSHING, D. Education for strategic environmental behaviour. **Environmental Education Research**, [S. l.], v. 4, p. 437-452, 2007.

CLUB OF ROME. **Planetary emergency plan**. 2019. Available at <https://www.clubofrome.org/impact-hubs/climate-emergency/>. Access: 15 June 2020.

CONSELHO NACIONAL DE EDUCAÇÃO (CNE). **Recomendação sobre Educação Ambiental, de 26 de novembro de 2019**. Lisboa, 2019. Available at: https://www.cnedu.pt/content/noticias/CNE/Recomendacao_Educacao_Ambiental.pdf. Access: 15 June 2020.

CORNER, A.; ROBERTS, O.; CHIARI, S.; VÖLLER, S.; MAYRHUBER, E.S.; MANDL, S.; MONSON, K. How do young people engage with climate change? The role of knowledge, values, message framing, and trusted communicators. **WIREs Climate Change**, [S. l.], v. 6, p. 523-534, 2015. DOI: 10.1002/wcc.353.

CRESWELL, J. W. **Research Design: Qualitative, Quantitative, and Mixed Methods Approaches**. 3. ed. Thousand Oaks, CA: Sage Publications, 2009.

FAGAN, M. The Paradox of Anthropocene Inaction: Knowledge Production, Mobilization, and the Securitization of Social Relations. **International Political Sociology**, [S. l.], v. 17, n.

1, olad002, 2023. DOI: 10.1093/ips/olad002. Available at <https://academic.oup.com/ips/article/17/1/olad002/7032855>. Access 15 June 2023.

FREITAS, M. Educação Ambiental e/ou Educação para o Desenvolvimento Sustentável? Uma análise centrada na realidade portuguesa. **Revista Iberoamericana de Educación**, [S. l.], n. 41, p. 133-147, 2006.

GIFFORD, R. The dragons of inaction: psychological barriers that limit climate change mitigation and adaptation. **American Psychologist**, [S. l.], v. 66, n. 4, p. 290–302, 2011. DOI: 10.1037/a0023566.

GRUPO DE TRABALHO DE EDUCAÇÃO PARA A CIDADANIA (GTEC). **Estratégia Nacional de Educação para a Cidadania**. Lisboa: República Portuguesa, XXI Governo Constitucional, 2017. Available at: <https://cidadania.dge.mec.pt/sites/default/files/pdfs/national-strategy-citizenship-education.pdf>. Access: 15 June 2020.

HAWTIN, M.; PERCY-SMITH; J. **Community Profiling: A Practical Guide**. UK: McGraw-Hill Education, 2007.

HOPE, E. Preparing to Participate: The Role of Youth Social Responsibility and Political Efficacy on Civic Engagement for Black Early Adolescents. **Child Ind Res**, [S. l.], v. 9, p. 609–630, 2016. DOI: 10.1007/s12187-015-9331-5.

LOTZ-SISITKA, H.; ALI, M. B.; MBHEPO, G.; CHAVES, M.; MACINTYRE, T.; PESANAYI, T.; WALS, A.; MUKUTE, M.; KRONILD, D.; TRAN, D. T.; JOON, D.; MCGARRY, D. Co-designing research on transgressive learning in times of climate change. **Current Opinion in Environmental Sustainability**, [S. l.], n. 20, p. 50–55, 2006. DOI: 10.1016/j.cosust.2016.04.004.

MALAFAIA, C.; DIÓGENES-LIMA, J.; PINHEIRO, S.; CRUZ, J. "If not even the school listens to us...": Echos of climate justice on the ground. **JSSE - Journal of Social Science Education**, [S. l.], v. 4, 2023. DOI: 10.11576/jsse-6346.

MANGANELLI, S.; LUCIDI, F.; ALIVERNINI, F. Italian adolescents' civic engagement and open classroom climate: The mediating role of self-efficacy. **Journal of Applied Developmental Psychology**, [S. l.], v. 41, p. 8-18, 2015. DOI: 10.1016/j.appdev.2015.07.001.

MARQUES, R. R.; FARIA, J. L.; MENEZES, I. Investigar com jovens na escola pública: A estratégia WC (WaterCircle) como espaço de construção coletiva do conhecimento e ação na Educação Ambiental. **Currículo Sem Fronteiras**, [S. l.], v. 18, n. 3, p. 981-1002, 2018.

MENEZES, I.; FERREIRA, P. Cidadania participatória no cotidiano escolar: a vez e a voz das crianças e dos jovens. **Educar em Revista**, Curitiba, n. 53, p. 131-147, 2014. DOI: 10.1590/0104-4060.36586.

MONROE, M. C.; PLATE, R; OXARART, A.; BOWERS, A.; CHAVES, W. A. Identifying effective climate change education strategies: a systematic review of the research. **Environmental Education Research**, [S. l.], 2017. DOI: 10.1080/13504622.2017.1360842.

MONTEIRO, A. **Plano Metropolitano de Adaptação às Alterações Climáticas**. 2017. Retirado em: http://portal.amp.pt/media/documents/2019/02/28/AMP_PMAAC.pdf. Access: 15 June 2020.

MUCCIONE, V.; HUGGEL, C.; BRESCH, D.; JURT, C.; WALLIMANN-HELMER, I.; MEHRA, M. K.; CAICEDO, J. D. P. Joint knowledge production in climate change adaptation networks. **Current Opinion in Environmental Sustainability**, [S. l.], n. 39, p. 147-152, 2019. DOI: 10.1016/j.cosust.2019.09.011.

OJALA, M. Hope in the Face of Climate Change: Associations with Environmental Engagement and Student Perceptions of Teachers' Emotion Communication Style and Future Orientation. **The Journal of Environmental Education**, [S. l.], v. 46, n. 3, p. 133-148, 2015. DOI: 10.1080/00958964.2015.1021662.

OJALA, M. Regulating worry, promoting hope: How do children, adolescents, and young adults cope with climate change? **International Journal of Environmental & Science Education**, [S. l.], v. 7, n. 4, p. 537-561, 2012.

OJALA, M. Young people and global climate change: Emotions, coping, and engagement in everyday life. In: ANSELL, N.; KLOCKER, N.; SKELTON T. (ed.). **Geographies of global issues: Change and threat: Geographies of children and young people**. Singapore: Springer Science + Business Media, 2016. DOI: 10.1080/00958964.2015.1021662.

PEDROSO, V. (coord.) **Referencial de Educação Ambiental para a Sustentabilidade para a Educação Pré-Escolar, o Ensino Básico e o Ensino Secundário**. Lisboa: Ministério da Educação, 2018.

PIHKALA, P. Anxiety and the ecological crisis: An analysis of eco-anxiety and climate anxiety. **Sustainability**, [S. l.], v. 12, n. 19, p. 7836, 2020. DOI: 10.3390/su12197836.

PINHEIRO, S.; TORRES, A. C.; DIÓGENES-LIMA, J.; PEREIRA, B.; MALAFAIA, C. How can the use of participatory and co-creation approaches enhance young people's civic participation for climate change adaptation? In: INTERNATIONAL TECHNOLOGY, EDUCATION AND DEVELOPMENT CONFERENCE, 17., 2023. **Proceedings [...]**. Valencia: IATED Academy, 2019. p. 7604-7610.

REIS, P. G. R. Cidadania Ambiental e Ativismo Juvenil. **Ensino de Ciências e Tecnologia em Revista – ENCITEC**, [S. l.], v. 11, n. 2, p. 05-24, 2021, DOI: 10.31512/encitec.v11i2.433. Available at: <https://san.uri.br/revistas/index.php/encitec/article/view/433>. Access: 14 June 2023.

REIS, P.; TINOCA, L. A avaliação do impacto do projeto “We Act” nas percepções dos alunos acerca das suas competências de ação sociopolítica. **Revista Brasileira de Ensino de Ciência e Tecnologia**, [S. l.], v. 11, n. 2, p. 214-231, 2018.

RIBEIRO, P. **Uma cartografia de sentidos de inclusão social: análise de políticas, dispositivos e discursos sobre exclusão social, educação/formação e emprego**. Orientadores: José Alberto Correia e João Caramelo. 2019. 403 f. Tese (Doutorado em Ciências da

Educação) – Faculdade de Psicologia e Ciências da Educação, Universidade do Porto, Porto, Portugal, 2019. Available at: <https://repositorio-aberto.up.pt/handle/10216/121843>. Access: 15 June 2020.

RIOS, C.; NEILSON, A. L.; MENEZES, I. COVID-19 and the desire of children to return to nature: Emotions in the face of environmental and intergenerational injustices. **The Journal of Environmental Education**, [S. l.], v. 52, n. 5, p. 335-346. 2021. DOI: 10.1080/00958964.2021.1981207.

ROCHE, J.; BELL, L.; GALVÃO, C.; GOLUMBIC, Y. N.; KLOETZER, L.; KNOBEN, N.; LAAKSO, M.; LORKE, J.; MANNION, G.; MASSETTI, L.; MAUHLIN, A.; PATA, K.; RUCK, A.; TARABA, P.; WINTER, S. Citizen Science, Education, and Learning: Challenges and Opportunities. **Frontiers in Sociology**, [S. l.], v. 5:613814, 2020. DOI: 10.3389/fsoc.2020.613814.

SAHEB, D.; RODRIGUES, D. G. Formação continuada em educação ambiental para professores de educação infantil na visão da complexidade e da transdisciplinaridade. **Revista Iberoamericana de Estudos em Educação**, Araraquara, v. 18, n. 00, e023008, 2023. DOI: 10.21723/riaee.v18i00.15052. Available at: <https://periodicos.fclar.unesp.br/iberoamericana/article/view/15052>. Access: 14 June 2023.

SCHMIDT, L.; GUERRA, J. Do ambiente ao desenvolvimento sustentável: Contextos e protagonistas da educação ambiental em Portugal. **Revista Lusófona de Educação**, [S. l.], n. 25, p. 193-211, 2013.

SOLHAUG, T. Knowledge and Self-efficacy as Predictors of Political Participation and Civic Attitudes: with relevance for educational practice. **Policy Futures in Education**, [S. l.], v. 4, n. 3, p. 265-278, 2006. DOI: 10.2304/pfie.2006.4.3.2652006.

UN GENERAL ASSEMBLY (UNGA). **Transforming our world: The 2030 agenda for sustainable development**. [S. l.]: United Nations, 2015. Available at <https://sdgs.un.org/2030agenda>. Access: 9 June 2020.

UNICEF UK. **Youth Advocacy Toolkit**. [S. l.: s. n.], 2019. Available at: <https://www.unicef.org.uk/wpcontent/uploads/2019/03/Youth-Advocacy-Toolkit.pdf>. Access: 8 Mar. 2023.

URSIN, M.; LORGEN, L. C.; ALVARADO, I. A. O.; SMALSUNDMO, A.-L.; NORDGÅRD, R. C.; Bern, M. R.; BJØRNEVIK, K. Promoting Intergenerational Justice Through Participatory Practices: Climate Workshops as an Arena for Young People's Political Participation. **Frontiers in Psychology**, [S. l.], v. 12, 727227, 2021. DOI: 10.3389/fpsyg.2021.727227.

VILCHES, A.; GIL-PÉREZ, D.. La transición a la sostenibilidad como objetivo urgente para la superación de la crisis sistémica actual. **Revista Eureka sobre Enseñanza y Divulgación de las Ciencias**, [S. l.], v. 13, n. 2, p. 395-407, 4 dez. 2015. Available at: <http://hdl.handle.net/10498/18296>. Access: 5 May 2023.

YOONG, S.W.; BOJEL, J.; OSMAN, S.; HASHIM, N.H. Perceived Self-Efficacy and its Role in Fostering Pro-Environmental Attitude and Behaviours. **Asian Journal of Business and Accounting**, [S. l.], v. 11, n. 2, p. 151-186, 2018.

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