

INTERGENERATIONAL CLIMATE CHANGE EDUCATION IN PRIMARY AND SECONDARY SCHOOLS: AN EXPLORATORY ANALYSIS OF TEACHERS' PERCEPTIONS, EXPERIENCES AND CHALLENGES IN FRANCE, GREECE, BULGARIA, CYPRUS, AND ROMANIA

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Abstract

The purpose of this paper is to investigate teachers' perceptions, experiences, and challenges on integrating Intergenerational Learning (IGL) to Climate Change Education (CCE) across five European countries. Using a narrative, exploratory method, the study delves into the experiences and perspectives of 34 in-service primary and secondary school teachers, who participated in group semi-structured interviews. This study reveals that while Climate Change Education is recognized as crucial, it remains insufficiently integrated into formal curricula, and teachers often lack the necessary resources and training. Another theme that emerged was the need to consider cultural and educational differences in developing effective and contextually appropriate Climate Change Education programs. While Intergenerational Learning was largely unfamiliar to teachers, yet it is perceived as a valuable approach for enriching Climate Change Education with experiential and collaborative learning experiences that will bring students closer to the community and nurture responsible changemaker citizens. Additionally, key challenges that participants shared, include: time-constrained curricula, inadequate administrative support, engagement of stakeholders, design of appropriate activities. Despite these challenges, teachers expressed strong interest in these topics and highlighted the need for hands-on training and supportive educational resources to effectively incorporate Intergenerational Learning into their teaching practices. This study underscores the importance of fostering a collaborative and cross-curricular educational environment that bridges generational gaps to enhance Climate Change Education, develop students' 21st century skills, and nurture positive attitudes towards a more sustainable future.

Keywords: Climate Change Education, Intergenerational Learning, school education, teachers' perceptions, 21st century skills, sustainability, active citizenship.

1 INTRODUCTION

The Green Generations project is a KA-220 Erasmus+ Cooperation Partnership in School Education, developed from December 2022 to April 2025. The project is led by a consortium of five European organisations¹ specialising in social and pedagogical innovation, including two schools, from five European countries (France, Bulgaria, Romania, Greece and Cyprus). In the framework of this project, the participating organisations share their combined expertise in non-formal education, including specific knowledge with multicultural and neurodiverse primary, secondary and high school students.

The Green Generations project's research and development topic is tackling climate change through intergenerational learning. The project aims to support teachers' continuous professional development by designing an educational package, composed of guidelines and lesson plans, focusing on climate change education (CCE) within an intergenerational learning (IL) process, designed for primary, secondary and high school teachers, as well as non-formal educators, in their educational settings.

¹ Synthesis (Cyprus) is a centre for research and education. Eutopique (France) is a non profit organisation specialising in the development of 21st century skills. Stimmuli (Greece) is a social innovation and research organisation. Know & Can (Bulgaria) is an NGO working in the field of non formal education, human and civil rights. Centrul Judetean de Excelenta Galati (Romania) is an innovative school for high potential students from all origins, combining primary, secondary and high school. 1st Primary school of Alexandria (Greece) is a public primary school educating children from multicultural backgrounds in a rural environment.

In order to do so, the consortium has initiated and developed a research phase in the early stages of the project, starting with a desk research on CCE and IGL, and proceeding with empirical research through online survey and focus groups implementation. The purpose of this study is to explore the perceptions, challenges and training needs of primary, secondary and high school teachers on the topics of climate change education (CCE), Intergenerational Learning (IGL) in five different European countries. More specifically, the research questions addressed through the five focus groups implemented, include:

- 1 What are teachers' perceptions of CCE and IGL?
- 2 What challenges do teachers face in integrating these topics?

2 CONCEPTUALIZATION OF CLIMATE CHANGE EDUCATION AND INTERGENERATIONAL LEARNING

Climate Change Education (CCE) is increasingly recognized as a critical component of formal education aimed at equipping students with the knowledge, skills, and attitudes necessary to address the pressing challenges posed by climate change. Despite its importance, CCE remains underrepresented in school curricula across many countries. Studies show that while awareness of climate change is high among the general population, effective education strategies are lacking, particularly in the integration of climate-related content into existing curricula (Murphy & Martínez Sainz, 2020; Bangay, 2022). In many countries, CCE is often introduced through non-formal education initiatives or isolated projects rather than as a comprehensive, integrated part of the educational framework (Monroe et al., 2019). This fragmented approach hinders the development of a consistent understanding of climate issues among students and limits their ability to engage meaningfully in climate action.

Intergenerational Learning (IGL), on the other hand, offers a unique pedagogical approach that facilitates the sharing of knowledge and skills across generations. It is based on the premise that learning is a lifelong process that benefits from the diverse perspectives and experiences of different age groups. Although IGL is widely acknowledged for its potential to build social cohesion and foster mutual understanding between generations, it remains underutilized in formal educational settings (Ayalon et al., 2022). In the context of climate change education, IGL can provide a platform for older generations to share their historical and cultural experiences related to environmental changes, thereby enriching students' learning and fostering a deeper, more personal connection to the subject (Tambaum, 2022). Despite these benefits, the integration of IGL into school curricula is often constrained by a lack of awareness among educators and a paucity of structured resources and training (Anderson, 2012).

The integration of CCE and IGL presents an opportunity to bridge generational gaps and create a more holistic and community-oriented approach to environmental education. Combining these pedagogies can enhance students' engagement by contextualizing climate issues within the lived experiences of older generations, thereby promoting a deeper understanding of the social, cultural, and ethical dimensions of climate change (Ayalon et al., 2022). Such an approach not only enriches the educational experience but also helps build resilience and adaptive capacity within communities. This is particularly relevant in the context of the countries studied, where educational systems often operate in isolation from broader societal actors, limiting the potential for collaborative and experiential learning (Murphy & Martínez Sainz, 2020).

However, the successful integration of CCE and IGL requires overcoming several barriers. As highlighted in the focus group findings, teachers often lack the training and resources needed to effectively implement these approaches (Bangay, 2022). Additionally, cultural and institutional barriers, such as rigid curriculum structures and the perception of schools as isolated from the community, further complicate efforts to incorporate IGL into CCE (Monroe et al., 2019). To address these challenges, there is a need for targeted policy interventions that prioritize the professional development of teachers, the inclusion of IGL in educational frameworks, and the development of partnerships between schools and community organizations (Tambaum, 2022). Such measures can support the creation of an educational environment that not only prepares students to understand and tackle climate change but also fosters intergenerational solidarity and collective action.

3 METHODOLOGY

3.1 Rationale

The research aims to assess the existing practices and success factors, the places, means and contexts of Climate Change Education (CCE) and Intergenerational Learning (IL), and weather and how Climate Change Education is applied in an Intergenerational Learning context in the education system. The research phase was launched at the early stage of the project (Dec 2022 to May 2023) in order to set the foundation for the development of teachers' training resources. In order to develop the GreenGenerations Teachers' Training Package that offers useful guidance to teachers of primary and secondary education, we design and applied a mixed methodology approach by combining qualitative with quantitative data collection through literature review, online surveys and focus groups. The three approaches decided upon for this research made it possible to combine several dimensions and obtain a cross-reading of the data.

A first phase of four months, conducted from December 2022 to April 2023, was carried out to collect data through three lines of research, namely desk research, questionnaires, and online or face-to-face focus groups. Prior to designing the online survey and focus group, a desk research was conducted by the research team of the project consortium focusing on the existing trends and practices in the field of climate change education, intergenerational learning, multigenerational learning and climate change intergenerational learning. This desk research was based on current global education policies, educational and scientific literature review, online research. Based on the findings of the contextual analysis, the research team proceeded to the design of the online survey and focus group. An online questionnaire was developed and disseminated to teachers of primary and secondary education. to gather information and feedback on teachers' knowledge and possible practice of climate change education, intergenerational learning and their preferences in terms of teaching methods and pedagogical orientations. National focus groups were organised in all countries, led by the Green Generations partners, to investigate the perceptions and challenges faced by teachers in terms of integrating CCE through IGL in their settings. The current study is focused on the presentation of findings of the five national focus groups.

3.2 Sample

The study engaged 34 teachers of primary and secondary education across five European countries, including France (4), Greece (10), Cyprus(6), Romania (9), Bulgaria (5), in five national focus groups that were implemented either online or face-to-face. Teachers with multiple backgrounds, from both public and private schools, teaching in both advantaged and disadvantaged neighborhoods, urban and peri-urban areas, and with a wide range of students (social, ethnic and gender and students with disabilities), were involved. This diverse group of teachers enriched the collection of data with different insights that contributed to the design of an inclusive and flexible Teachers' Training Package. The involvement of the teachers was voluntary and drove by personal motivation for professional growth and creating impact towards CCE and sustainable growth at schools. Finally, the focus groups were conducted in partners' native languages, in order to enable wider participation and openness.

3.3 Data Collection

The focus groups were organized to dive deeper into the perceptions of teachers about CCE and IGLE, as well as to identify challenges that may face, when implementing CCE activities or programmes within their educational settings. Since teachers across different countries have different levels of familiarity with what CCE and IGL are, we designed the focus group discussion in an inclusive manner to ensure that all participants would be enabled to make valuable contributions based on their academic background and teaching experience. The questions delivered and discussed during the focus groups were based on the data analysis of the online survey's findings; more specifically, 149 questionnaires were analysed to gather information and feedback on teachers' knowledge and possible practice of CCE, IGL and their preferences in terms of teaching methods and pedagogical orientations. A report based on the data provided by the questionnaires was completed and shared among the partners to set the foundation for the focus group activities. Prior to the implementation of the national focus groups, a preparation meeting was organised to provide support to the partners in order to best carry out their national focus groups.

3.4 Data Analysis

Data analysis was made based on the overall collected material. A first analysis was led by each partner, analysing the data from their national context, using their knowledge of their national education system (attitudes, rules, objectives, etc.) and the culture and attitudes of their teachers. Following this step, all material was analysed collectively focusing on current practices, gaps and training needs of educators and teachers in the five European countries previously mentioned. A consolidation of the material was made through a cross-country report, in English, then translated in the consortium's five languages and disseminated through the project's website, newsletter and through the partners' media.

In this study, the data analysis will be summarized in the following thematic categories:

- 1 Teachers' perceptions and experiences
- 2 Challenges identified
- 3 Cultural and educational differences
- 4 Opportunities and Interests for Intergenerational Learning for Climate Change Education

Following this research phase, the consortium partners developed a first iteration of the Teachers' Training Package on Climate Change Education in an intergenerational context, to be tested by a selected group of pilot teachers during a transnational training event in Paris in 2023.

4 RESULTS

This section presents the findings from the focus group discussions conducted with teachers in France, Greece, Cyprus, Romania and Bulgaria organized under four key categories: Teachers' Perceptions and Experiences, Challenges Identified, Cultural and Educational Differences, and Opportunities and Interest in Intergenerational Learning (IGL).

4.1 Teachers' Perceptions and Experiences

Across all countries, teachers universally recognized the importance of CCE. However, the degree of familiarity and engagement with CCE varied. In some countries like Greece and Romania, where teachers had participated in climate-related projects, there was a greater familiarity with the topic. For example, one Romanian teacher stated, *"The Ministry of Education has made some progress in promoting climate change education in schools."* In Bulgaria and Cyprus, however, CCE was still perceived as an emerging subject, not yet integrated into the formal curriculum. In Bulgaria, one participant expressed that *"climate change education is not a priority yet, but it should be."* Similarly, in Cyprus, teachers voiced their concerns over the lack of hands-on learning opportunities and resources. In France, climate change remains on the periphery of the formal curriculum. As one French teacher stated, *"The question of the environment is almost non-existent in the formal curriculum, and the resources provided are insufficient."*

When it comes to IGL, teachers across all five countries reported limited familiarity with IGL. Most teachers inferred the meaning of IGL from its etymology but had little or no practical experience in implementing such pedagogies. In Cyprus, one teacher remarked, *"I had never heard of intergenerational learning before, but it seems to involve knowledge sharing between older and younger generations, which could be valuable."* In contrast, teachers from Romania and Greece showed more openness to the potential of IGL, recognizing the opportunity it offers to connect students with community elders, particularly on the topic of climate change.

In Bulgaria, while teachers acknowledged the potential benefits of IGL, one participant noted, *"It's hard to find practical ways to integrate intergenerational learning into our daily teaching."* In France, teachers echoed a similar sentiment, stating that the school system remains *"a closed place,"* making it difficult to incorporate external actors like parents or older community members into the educational environment.

4.2 Challenges Identified

One of the most prevalent challenges cited by teachers across all countries was the pressure of time-constrained curricula. In Greece, a teacher commented, *"The curriculum is too packed, and we barely have time to cover all the required subjects, let alone integrate new topics like climate change."* Teachers in Cyprus and Romania expressed similar concerns. In France, the challenge is compounded by a rigid

national education system, as one participant stated, *"We have a very full program, leaving little room for additional activities like climate education."*

In addition, in every country, teachers highlighted the lack of resources and professional training as significant barriers to effectively teaching climate change and implementing IGL. In Bulgaria, a teacher expressed, *"There are no specific materials or training for teachers on how to incorporate climate change education into the classroom."* Similarly, teachers in Cyprus and France lamented the lack of hands-on resources and lesson plans. One Cypriot teacher noted, *"Interactive training is necessary for teachers if we are expected to teach climate change effectively."*

Teachers also identified challenges in engaging external stakeholders, such as parents, local authorities, or community elders, in climate change education or IGL projects. In Romania, one teacher said, *"It is difficult to find older people willing to participate in intergenerational learning projects."* A similar sentiment was echoed in France, where a participant noted, *"It's culturally difficult to bring in outside actors like parents into the school system."*

4.3 Cultural and Educational Differences

Across the countries, cultural and educational contexts influenced how climate change education is perceived and implemented. In Greece and Romania, there was a strong emphasis on the need for climate education to prepare students for future environmental challenges. In Romania, a teacher stated, *"Climate change education is crucial because we live in one of the most polluted cities in the country, and we need to raise awareness among our students."*

In France and Bulgaria, climate change is seen as more of an abstract issue, with less urgency to integrate it into the formal curriculum. A French teacher noted, *"We are still at the beginning stages of incorporating environmental subjects into our education system, and it is often skimmed over."* In Cyprus, the focus was more on practical environmental actions like recycling, with one teacher stating, *"We try to incorporate climate-friendly actions such as recycling, but there's little mention of climate change in the formal curriculum."*

Regarding potential differences in curriculum structure across European countries, teachers from Romania and Greece expressed more flexibility in integrating climate change education through non-formal activities or projects, whereas in France and Bulgaria, the rigid structure of the national curriculum left little room for such integration. In France, one teacher remarked, *"It's difficult to find time for extra projects due to the very full schedule."*

4.4 Opportunities and Interest for Intergenerational Learning for Climate Change Education

Despite the challenges, there was a broad recognition of the potential benefits of integrating IGL into climate change education. In Romania, teachers saw IGL as a way to bridge generational gaps and foster collaboration between students and community elders. One Romanian teacher noted, *"Thanks to the intergenerational approach, older people will feel less isolated, and younger generations will benefit from their wisdom."*

In Greece, some teachers had already experimented with intergenerational projects, mainly around cultural traditions, and expressed interest in expanding this to climate change. One Greek teacher commented, *"Combining traditional and modern approaches to tackling climate change could lead to powerful collaborations."*

In Cyprus, while teachers had little practical experience with IGL, they showed enthusiasm for its potential. One participant stated, *"Intergenerational learning could enrich climate education by bringing in the community and making the learning experience more holistic."*

In Bulgaria, teachers saw the potential of IGL but were concerned about the practicalities of implementing it. As one Bulgarian teacher expressed, *"It's a good idea in theory, but we need more support and concrete examples of how to apply it in our classrooms."*

5 DISCUSSION

The results from the focus groups conducted in France, Greece, Cyprus, Romania and Bulgaria reveal significant insights into the current state of Climate Change Education (CCE) and Intergenerational Learning (IGL) in schools across these countries. In this section, we will synthesize the findings in

relation to existing literature, explore the implications for practice, and highlight the cultural and educational nuances that influence the integration of CCE and IGL.

5.1 Synthesis of Findings

The findings from the focus groups align with recent literature indicating that, despite the increasing awareness of climate change, CCE is not yet fully integrated into formal education systems across many countries. Studies such as Murphy and Martínez Sainz (2020) emphasize the urgent need for embedding CCE in school curricula to foster environmental awareness and action among students. However, as evidenced in this study, teachers in all five countries noted that CCE is only sporadically addressed, with few dedicated resources or curriculum integration. In Bulgaria and Cyprus, for instance, CCE is not part of the formal curriculum, and teachers must often take the initiative to include it in their lessons through extracurricular projects or limited classroom activities.

In terms of teacher preparedness, the findings echo the broader literature highlighting the critical gap in teacher training for CCE (Anderson, 2012). Teachers in all countries reported a lack of sufficient professional development opportunities that would enable them to teach climate change effectively. The lack of hands-on training, resources, and support for teachers was a consistent theme, similar to the conclusions drawn by Bangay (2022), who found that the absence of structured guidance hampers the ability of educators to implement climate-related topics in their classrooms.

The focus group results also highlighted the unfamiliarity of teachers with Intergenerational Learning. Although the participants recognized the potential of IGL, especially in the context of CCE, they had limited experience applying this pedagogy. This finding aligns with the literature suggesting that IGL remains underutilized in educational contexts, despite its recognized benefits in fostering collaboration and knowledge transfer between generations (Ayalon et al., 2022). The teachers in our study, particularly those from Romania and Greece, were more open to the idea of integrating IGL into climate education, although they reported challenges such as the difficulty of finding older community members willing to participate in such initiatives. These challenges are similarly noted in the research by Tambaum (2022), who argue that logistical and societal barriers often limit the application of IGL in formal education settings.

5.2 Implications for Practice

The findings of this study offer several implications for the implementation of both CCE and IGL in European schools. First, there is an evident need for policy reforms to integrate CCE more formally into national curricula. As suggested by existing literature, curriculum-based CCE can significantly impact students' environmental awareness and promote sustainable behaviors (Monroe et al., 2019). For this to happen, education ministries in countries like Bulgaria, France, and Cyprus need to prioritize CCE by providing dedicated curriculum space and training programs for teachers. Incorporating experiential learning, a pedagogical approach mentioned by teachers in Greece and Romania, would further enrich students' understanding of climate change, as recommended by Tambaum (2022).

Second, the lack of teacher training presents an opportunity for professional development programs focused on CCE. Teachers expressed a clear need for hands-on resources, lesson plans, and interdisciplinary training, a finding that is well-supported by recent studies (Bangay, 2022). These programs should emphasize practical, project-based approaches that engage students in real-world problem-solving, as seen in successful CCE models (Trott, 2021). Moreover, developing guidelines for interdisciplinary approaches could help teachers integrate climate change topics into subjects like social studies, geography, and science, as some teachers in Romania and Greece have already attempted.

Intergenerational Learning, though largely unfamiliar, was recognized as a potentially valuable tool in enhancing CCE. IGL can bring contextual relevance and experiential richness to climate change education by involving older generations who can provide historical perspectives on environmental changes (Ayalon et al., 2022). To operationalize this, schools could partner with community organizations to facilitate IGL projects that connect students with local elders. These collaborations could take the form of storytelling workshops, community gardening projects, or joint environmental campaigns. Research by Tambaum (2022) shows that such projects can foster a sense of belonging and mutual respect between generations while contributing to collective climate action.

However, to fully harness the potential of IGL, there must be support from school leadership and local communities. Teachers in France and Bulgaria cited cultural and structural barriers, such as the closed nature of the school environment and the reluctance to engage external stakeholders. Addressing these

barriers will require a cultural shift towards greater openness and collaboration between schools and communities, as well as logistical support to facilitate intergenerational interactions (Monroe et al., 2019).

5.3 Cultural Considerations

The cultural and educational differences observed across the five countries in this study suggest that a one-size-fits-all approach to CCE and IGL is unlikely to succeed. For instance, teachers in Romania and Greece showed a higher degree of familiarity and engagement with CCE, partly due to non-formal educational projects supported by NGOs and local authorities. In contrast, the more rigid curriculum structures in France and Bulgaria limit teachers' flexibility in introducing new topics like climate change, and schools in these countries tend to operate in isolation from the broader community. These differences highlight the importance of developing contextually appropriate strategies for integrating CCE and IGL.

Furthermore, the perception of climate change varied across countries, with some teachers viewing it as a distant or abstract issue, as seen in France and Bulgaria, while others, particularly in Romania, emphasized its immediate and tangible impacts. This finding is consistent with research by Nepras et al. (2022), which underscores the role of local cultural and environmental contexts in shaping attitudes towards climate change education.

5.4 Future Directions

Given the identified challenges and opportunities, there are several avenues for future research and practice. First, longitudinal studies are needed to examine the long-term impacts of integrating CCE and IGL on students' environmental attitudes and behaviors. Such studies could explore how sustained engagement with these topics influences students' capacity for climate action and civic participation, an area identified as crucial by Trott (2021).

Second, further research should investigate the logistical and pedagogical frameworks necessary for the successful implementation of IGL in schools. This includes understanding how to effectively engage community members, mitigate logistical barriers, and create structured, sustainable partnerships between schools and local stakeholders. Additionally, exploring cross-curricular approaches to CCE and IGL, as highlighted by teachers in Romania and Greece, could offer valuable insights into how these topics can be integrated more seamlessly into existing subjects.

6 CONCLUSIONS

First, the study presents the general context of climate change education, pointing out the discrepancies between governmental plans and strategies and the actual education plans and strategies on the matter, leading to an analysis of the opportunities and challenges in climate change education today. The teachers' focus groups revealed and confirmed that while Climate Change Education is recognized as crucial, it remains insufficiently integrated into formal curricula, and teachers often lack the necessary resources and training. There is indeed a contradiction in terms between policies that require teaching a subject that teachers do not master and an otherwise busy curriculum. What's more, teaching conditions are becoming more complex: time, workload, adapting to new students, and so on. Between willingness and reality, despite the fact that many teachers are particularly motivated, it seems also difficult to engage external audiences. In most countries, families and other stakeholders are not included in the school ecosystem.

A second and third part focuses on the intergenerational learning context and the generational behavioural learning patterns. The study presents the benefits of such approaches, the causes that tend to increase the generational gap, the success criteria in this field and finally the opportunities and threats of intergenerational learning today. The need to consider cultural and educational differences in developing effective and contextually appropriate Climate Change Education programs emerged. While Intergenerational Learning was largely unfamiliar to teachers, it is yet perceived as a valuable approach for enriching Climate Change Education with experiential and collaborative learning experiences that will bring students closer to the community and nurture responsible changemaker citizens.

A fourth part of the study focuses on the teachers' usual pedagogical methods and the gaps and needs of teachers in both climate change education and intergenerational learning. Participating teachers believe their initial training isn't sufficiently adapted to contemporary issues such as climate change education. It does not involve collaborative learning practices such as intergenerational learning. Impact

assessment and quality criteria are not mentioned in the evaluation of school projects. We noted a general lack of confidence in leading such projects. The study highlights also the fact that social stakes (gender equality, professional orientations and health) often rank above environmental stakes, demonstrating the need for systems thinking education, connecting local stakes and global impact.

Additionally, key challenges that participants shared include: time-constrained curricula, inadequate administrative support, difficulties to engage stakeholders, lack of competence in designing appropriate activities. Despite these challenges, teachers expressed strong interest in these topics and highlighted the need for hands-on training and supportive educational resources to effectively incorporate Intergenerational Learning into their teaching practices. Finally, this study underscores the importance of fostering a collaborative and cross-curricular educational environment that bridges generational gaps to enhance Climate Change Education, develop students' 21st century skills, and nurture positive attitudes towards a more sustainable future.

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DATA AVAILABILITY STATEMENT

The data presented in this study are available upon request from the corresponding author. The data are not publicly available due to confidentiality reasons.

CONFLICTS OF INTEREST

The authors declare no conflict of interest. The funding authority had no role in the design of the study; in the collection and/or data analysis, in the synthesis of the study; or in the decision to publish the results.

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