Educational interventions and public support for EU climate action *

Irene Rodriguez
Universitat Pompeu Fabra
irene.rodriguez@upf.edu

Toni Rodon
Universitat Pompeu Fabra
toni.rodon@upf.edu

Zachary Dickson
London School of Economics
Z.Dickson@lse.ac.uk

Abstract

Climate change is a global challenge that demands both individual action and coordinated policy responses. As a supranational body, the European Union (EU) is often viewed as a key actor in driving collective efforts to address the climate crisis. However, its effectiveness depends on the support and cooperation of its Member States. In this article, we explore whether exposure to an educational session emphasising the importance of EU coordination influences support for EU-led climate action. Partnering with the "More in 24" campaign – an initiative designed to inform and engage young voters about the EU – we conducted a randomised field experiment to assess the causal impact of an EU-educational workshop on high school students' attitudes towards climate change and the EU's role in addressing it. Although perceived knowledge about the EU marginally increased, we find that the campaign did not increase students' opinion that the EU should have a greater role in fighting climate change, and had limited and insignificant effects on most related outcomes studied. These findings highlight the limits of short educational initiatives and the need for more sustained and intensive interventions to alter deeply held political attitudes.

Keywords: European Union, Civic Education, Field Experiment, Climate Change, Coordination

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1 Introduction

Climate change is a transnational crisis that requires coordinated responses from a wide range of actors, including national governments, international institutions, and civil society (Keohane and Victor 2016; Gaikwad, Genovese, and Tingley 2022). The European Union (EU), as a unique supranational body, is theoretically well-positioned to lead collective efforts and coordinate environmental policy among its member states (Kivimaa et al. 2025; Jordan et al. 2010a; Hix and Høyland 2022). However, a significant obstacle undermines its capacity for decisive action: many citizens perceive the EU as remote and unresponsive, often directing their political demands toward national institutions rather than the EU level (Hobolt and Vries 2016; De Vries, Hobolt, and Walter 2021; O'Grady and Abou-Chadi 2019). This disconnect is intensified by national politicians who frequently frame European issues in domestic terms, hindering the collective political action necessary to address urgent trans-boundary crises like climate change (Finnegan 2022; Clark and Zucker 2024; Pereira et al. 2025; Bechte and Scheve 2013; Kollberg et al. 2025; Hix and Høyland 2022). Moreover, the EU is often blamed during times of crisis. Politicians would externalise responsibility to the EU, particularly in scenarios of economic decline (Hobolt and Tilley 2014; Costa Lobo and Lewis-Beck 2012; Traber, Schoonvelde, and Schumacher 2020). This strategic behaviour further undermines the EU's legitimacy in the eyes of the citizens.

As underscored by annual United Nations Climate Change Conferences (UNFCCC-COP), meaningful progress hinges on collective efforts across borders—both to curb emissions and to adapt to rapidly shifting environmental conditions. Yet, one persistent challenge is that national governments often have little incentive to respond to public preferences beyond their own borders (Hix and Høyland 2022). Likewise, citizens rarely hold foreign governments accountable or demand coordinated international action. This reluctance is often reinforced by strong national identities, limited understanding of foreign political systems, and the absence of mechanisms to engage with or influence supranational institutions (Von Homeyer, Oberthür, and Jordan 2021; Bechte and Scheve 2013; Putnam 1988)

Within this broader context of transnational governance, the European Union offers a compelling case. Its supranational design enables the coordination of environmental policy among member states, yet the same accountability challenges persist. The EU's complex structure,

coupled with national parties' tendency to frame European issues in domestic terms, often undermines its capacity to act decisively on urgent transboundary challenges like climate change (Finnegan 2022; Clark and Zucker 2024; Pereira et al. 2025; Hix and Høyland 2022; Bechte and Scheve 2013).

This study confronts a critical question at the intersection of political socialisation and EU governance: can this gap be bridged through targeted educational interventions? We focus specifically on young people, a demographic whose political attitudes are still in their formative stages. During these "impressionable years", children and adolescents are particularly receptive to the influence of external factors like school-based programmes, and the attitudes they form can persist into adulthood (Finkel, Neundorf, and Rascón Ramírez 2023; Holbein and Hillygus 2020; Weinschenk and Dawes 2022). Therefore, understanding whether educational workshops can shape how young, future voters perceive the role of international bodies is essential for the long-term legitimacy and effectiveness of supranational climate policy.

This article presents findings from a randomised field experiment designed to assess the causal impact of an educational intervention initiative on high school students' attitudes towards the EU and climate change. Partnering with the "More in 24" campaign, we tested whether a "learning-by-doing" workshop, prompting students to conceptualise climate change as an issue requiring EU-level coordination, could increase their support for a stronger EU role.

Our results indicate that the informational intervention had limited effects. Students who participated in the programme reported slightly higher levels of knowledge about the EU and hypothetical vote intention. However, the workshops did not significantly increase support for a greater role for the European Union in combating climate change. Further analysis of open text responses using transformer-based topic modelling reveals subtle shifts in how students conceptualised climate change, suggesting that the intervention may have had a limited influence on the way students interpreted and framed challenges related to climate change.

This article, therefore, contributes to two key strands of literature. First, the article contributes to the expanding literature on the role of educational interventions, such as civic education (E. Finkel, Neundorf, and Rascón Ramírez 2024; Neundorf and Smets 2017; Sears and Brown 2023) and simulation exercises (Oberle and Leunig 2016). Civic education, delivered through both long-term courses and short-term initiatives (or a combination of both), is often

based on the belief that it enhances students' civic knowledge and encourages greater political participation later in life (Galston 2007; Holbein and Hillygus 2020; Weinschenk and Dawes 2022). The EU has explicitly embraced this idea, committing to expanding citizenship education as part of its broader democratic agenda.[1] Yet, the empirical evidence remains mixed. Some studies suggest that civic education can improve political knowledge and engagement (Fitzgerald et al. 2021). Bhatti 2010 goes as far as to note how election results would change if citizens' political knowledge increased. On the other hand, other studies find more limited or inconsistent effects. For instance, a recent meta-analysis by Finkel et al. (2022) concludes that while civic education may boost voter turnout, it does not reliably strengthen democratic values or cognitive political engagement.

Second, it engages with research on coordination problems in EU climate policy (Kellner, Petrovics, and Huitema 2024; Skovgaard et al. 2023; Jordan and Schout 2006). Climate action at the EU level exemplifies a classic coordination dilemma, where policies negotiated by supranational institutions are ultimately implemented by individual member states, rather than by the EU itself. Additionally, certain areas of decision-making at the EU level require unanimity, which makes it all the more important that all EU member states are aligned with the EU (Oberthür and Dupont 2021; Delreux and Happaerts 2016; Begg, Hodson, and Maher 2003). In this context, citizens, as potential enforcement agents, often lack the tools or incentives to hold different levels of government accountable. While prior scholarship has extensively examined such coordination challenges from an institutional perspective (Egeberg and Trondal 2016; Trein, Meyer, and Maggetti 2019; Begg, Hodson, and Maher 2003), less attention has been paid to the role of citizens: can individuals conceptualise climate change as a cross-border issue, and are they willing to support EU-level solutions? This study addresses that gap by exploring the conditions under which citizens, particularly young people, might adopt a transnational lens on climate governance.

All in all, building on this debate, the article tests whether a brief workshop that provides both institutional information as well as opportunities for independent thinking on the EU can influence EU-related attitudes and behaviour among young people. Although the workshop was short in duration, such one-off sessions are a common feature of civic education initiatives, which

1. Citizenship education in national curricula, https://www.europarl.europa.eu/RegData/etudes/BRIE/2023/747459/EPRS_BRI(2023)747459_EN.pdf.

often rely on compact, learning-by-doing, classroom-based interventions to engage students. The article, therefore, offers new evidence on the potential, as well as the limits, of short-term informational treatments to alter or shape citizens' attitudes and behaviours towards supranational institutions.

2 Climate change and the European Union

The European Union has taken on responsibility for an increasing number of governance areas across Europe. Although certain powers–such as national defence, security, and social policy–mostly remain within the domain of individual Member States, national governments frequently turn to the EU for support or intervention. Coordinating effective policy responses remains a fundamental challenge for all governments, and this is particularly true for the EU. As a unique supranational institution, the EU exercises binding authority over its Member States in several domains, making questions of coordination and compliance especially salient (Peters 2012).

Across many different policy domains, and most certainly on climate change, the EU faces a coordination problem (Begg, Hodson, and Maher 2003; Jordan et al. 2010b; Egeberg and Trondal 2016). EU countries need to agree among themselves, while each country keeps an eye on the preferences of its national citizens. The shifting distribution of policy competencies between the EU and its Member States, the strategic autonomy retained by national governments, and the tendency of national politicians to frame policy issues through a domestic lens often delay or hinder collective political action at the EU level. As the Covid-19 case illustrated, divergent national responses were commonly justified on the grounds of national preferences and political legitimacy (Pacces and Weimer 2020; Rodríguez et al. 2025).

The challenge of taking coordinated action on climate change is a prominent illustration of the coordination problem. Institutions at the EU level have pushed for change, for instance by establishing common standards and targets following the principle of burden-sharing, or 'pollution federalism' as coined by Serban (2021). Yet, as the farmers' protests in early 2024 illustrated, burden sharing has proven to be difficult to govern. The politicisation of climate change (Dickson and Hobolt 2024) or the tendency of politicians to frame it as a national issue (Wright et al. 2023) has slowed down or even halted the design and implementation of climate action.

The coordination problem is not, however, restricted to governments or political actors. Citizens also play a key role; their demands are often directed at national institutions. Although the trend is slowly changing (Bernauer 2013), the EU is still perceived as distant and unresponsive by many citizens. The so-called "democratic deficit" (Follesdal and Hix 2006) of the EU arises from several challenges of accountability within the EU system. From weak electoral linkages between citizens and EU decision-makers to policy processes dominated by executives rather than elected representatives, citizens have reduced incentives to engage with the EU and demand accountability from its institutions.

EU elections being considered by many as second-order contests is only a symptom of a deeper structural problem: the EU decision-making processes remain isolated from direct public accountability. This results in lower interest and engagement, mobilisation (Reif and Schmitt 1980; Marsh 1998) and poor accountability and responsiveness from EU institutions. Thus, the lack of citizens' pressure on elected EU representatives or institutions–either through the ballot box or through other protests–does not create the necessary incentives for coordinated action at the supranational level.

Yet despite these structural challenges, recent research has shown that pan-European citizens' demands, which are increasingly common (Haugestad et al. 2021), can influence the EU level. Schürmann (2024) shows that German MPs were responsive to *Fridays for Future* protest events in their districts, Braun and Schäfer (2022) show a higher tendency to participate in European Parliament elections when citizens attribute greater importance to the issue of climate change, and conclude that the effect of a framing experiment attributing a policy to the EU (versus the national government) was further enhanced when participants identified with the EU (Dickson et al. 2025).

3 Political socialisation and education

Besides being an educational activity that offers a different educational experience, both in terms of content and methods, civic education programmes seek to make an impact during a crucial period of students' formative experiences. Thus, during the early political socialisation period, children and young adults are particularly receptive to the influence of external factors, such as their environment, family, the media or school (Neundorf and Smets 2017). As shown

by previous research, the attitudes and opinions they form during childhood tend to persist into adulthood (Kinder, Donald R. and Sears, David O. 1985; Bartels, Larry M. and Jackman, Simon 2014) and may remain stable over the life course. Childhood and adolescence are often regarded as the "impressionable years", a period in which individuals are more receptive to new information and experiences (Kinder, Donald R. and Sears, David O. 1985).[2]

Schools are often regarded as key actors for developing students' political knowledge and skills, based on the understanding that pupils need to play a full part in a democratic society as active and informed citizens. Whether integrated as part of the curricula or offered through extracurricular activities, different initiatives have been designed to enhance students' understanding of civic principles, institutions, and processes. Commonly grouped under the umbrella of civic education programmes, these initiatives aim to lay the foundation of civic knowledge, encouraging critical thinking and the analysis of political and social issues. With the active engagement that comes with this learning perspective, students are meant to gain a sense of empowerment that fosters a greater sense of efficacy and relevance, while also improving problem-solving skills and increasing practical knowledge on certain issues. Additionally, using real-world examples and with a learning-by-doing framework, students gain hands-on experience and develop the skills required to navigate complex civic issues (Commission and Education Youth Sport & Culture 2024).[3]

Previous research has shown that civic education programmes impact political attitudes. For instance, a recent study by Hohenberg, Krakowski, and Morisi (2022) shows how school debating reduces conspiratorial views and increases critical thinking, reflected in students' truth discernment. However, as Manning and Edwards (2014) identifies, many articles use non-randomised samples, which implies they study citizens who intentionally self-select into specific programmes, making it difficult to disentangle the effect of the programme from the effect of students' characteristics.

2. There is much debate on the effect of the 'impressionable years' on people's social and political attitudes over their life course. The issue has also been studied in the context of attitudes towards the European Union, especially using observational data and Age-Period-Cohort (APC) models. Results are mixed. While Down, Ian and Wilson, Carole (2013) find that it is a learning period that plays a critical role in shaping diffuse support for the EU (Easton 1975; Hobolt and Vries 2016), Ringlerova, Zuzana (2020) finds that it is not an essential factor, as it can also be acquired through life experiences in adulthood.

3. While civic education is traditionally associated with school programmes, numerous impactful programmes operate outside formal educational settings, engaging diverse populations through community-based initiatives, experiential learning, and informal education oriented towards the general public (Donbavand and Hoskins 2021, make a systematic review of 25 studies on Citizen Education programme effects). These programmes widely differ in duration and content.

Albeit with notable exceptions (Donbavand and Hoskins 2021), there is a lack of Randomised Control Trials in the study of whether and how educational interventions affect political attitudes. Therefore, much of the existing work that studies the effects of educational programmes does not causally identify the effects of such programmes on students' attitudes. Additionally, there have been relatively few field experiments involving any form of Citizenship Education programme (Donbavand and Hoskins 2021 only identified 25).

Most importantly, educational workshops frequently take the form of brief, one-off sessions, often co-organised by external actors outside the school. These educational workshops often consist of short-term interventions designed to improve students' understanding of politics and society through targeted exposure to information and participation in simulation exercises. Because time slots outside the formal curriculum are typically limited, these activities are usually brief but intensive.[4]

These educational interventions are grounded in the idea of fostering specific skills, knowledge, and attitudes in students regarding the topic at hand. They can vary in length and in content, but most of them share some common features: they have a specific (and realistic) purpose, they are limited in time and space, involve several participants who need to show some planning and implementation skills, and they involve teamwork (Radić-Bojanić and Pop-Jovanov 2018). As Radić-Bojanić and Pop-Jovanov (2018, 225) note, they are "unique, innovative and creative" learning experiences that provoke a specific response to a need or problem in a given context, and can range from one-hour sessions to a few days.

These workshops, while similar, differ from traditional civic education programmes in scope and duration. Civic education often takes place with a long-term objective and curriculum, aiming to shape civic skills and democratic values over time through gradual knowledge acquisition and attitude development (Neundorf and Smets 2017; Holbein and Hillygus 2020). In contrast, short-term educational workshops offer more focused and hands-on opportunities to learn and discuss. These brief, targeted activities expose participants to specific political content or institutions, and can potentially influence attitudes and knowledge in the short term (Donbavand and Hoskins 2021; Hall, Richards, and Shabman 2011; Archer, Moote, and MacLeod 2020).

4. Short, external school-based interventions are common across different topics. For example, there are many police-led interventions, sexual and reproductive health workshops, or public health interventions (see, for example, Barnett 2011; Crone et al. 2003).

While most studies in political science focus on long-term curricular or civic education exposure, empirical evidence suggests that even short-term civic interventions can enhance civic knowledge, political efficacy and democratic attitudes, particularly when they consist of activities that encourage authentic, participatory learning. Specifically on the topic of the EU, Høgh and Larsen 2016 show how individuals who were exposed to information on the European Parliament election through a workshop were more knowledgeable about and more likely to participate in the European Parliament election. Our study tests whether brief, information-oriented and participation-rich workshops–rather than a full civic education curricula–can influence political attitudes and issue-related engagement.

Our empirical expectations are the following. First, we expect that students who participated in the educational workshops will increase their perceived knowledge about the European Union. The workshop explicitly dealt with EU institutions, competences and the upcoming EU Parliamentary elections of 2024, and provided participants with a short but focused information treatment. Following Høgh and Larsen 2016, who find that one-day workshops increase factual knowledge among first-time voters, we expect students to be (or at least, perceive they are) more knowledgeable about the European Union after having participated in the workshops.

Similarly, we expect to find higher intended participation. Knowledge and information have been linked to higher levels of participation (Delli Carpini and Keeter 1997; Lassen 2004). After the informational treatment, individuals will be more likely to view EU elections as meaningful, which should increase their willingness to participate in the EU parliamentary elections.

Moreover, we expect that these students will be more likely to consider that being part of the EU is a good thing and will generally have a more positive attitude towards the EU after having participated in the workshop (Oberle and Leunig 2016). Having been exposed to information about the EU's role and achievements, and provided the opportunity to reflect on how the EU can help in tackling an important issue such as climate change, individuals will be more likely to increase their diffuse support (Easton 1975) for European integration (Boomgarden et al. 2011). Learning about coordination mechanisms and EU-level responses may prompt participants to view EU membership as beneficial for their countries and for other countries that may join the Union.

Regarding items about climate change, we expect students who were exposed to the EU

treatment and who are primed to think that acting against climate change requires EU co-ordination will be more likely to think that climate change is important and that action is necessary. We expect that the effects of the EU treatment should be greater relative to the local treatment. In the latter, students were encouraged to think about climate change as a localised/regionalised problem and therefore the expectation is that their concerns about the consequences of climate change should be lower compared to the EU treatment. As Barth et al. (2021, 2) put it, "[i]f people perceive themselves to be part of a group who are fighting climate change, with some chance of success, they will be motivated to engage in pro-climate behaviour".

However, the effect of the EU treatment on whether the institutions are doing enough is not clear-cut. On one hand, students exposed to the EU treatment received information about the EU's actions on climate change, which might be expected to increase their perception that the EU is doing enough to fight climate change (in relative terms, as compared to the control group). On the other hand, the short educational intervention might have backfired, as it might have given the impression to students that the EU needs to do more (and hence is not doing enough on climate change). In practical terms, we hypothesise that one of the two hypotheses might be true.

In terms of who should lead the fight against climate change, we expect students receiving the EU treatment to be more likely to answer that the EU should lead the fight.

Finally, since the workshop (especially the EU treatment groups) was especially designed to (1) provide students with information about the EU and (2) make them reflect on its role as a supra-national institution, we expect those in the EU treatment to elaborate in their responses for the open-ended question –an indicator of greater cognitive engagement and elaboration prompted by the EU-focused hands-on activity.

4 Experimental Design

We conducted a pre-registered field experimentto identify the causal effects of a short educational workshop. To administer the field experiment, we partnered with the *More in 24* team. *More in 24* is a project sponsored by the European Youth Card Association[5] with a primary

5. Find more information on the project here.

goal of enhancing youth political participation and awareness across Europe. *More in 24* develops civic education sessions all around the European Union to incentivise youth political engagement and EU knowledge.

The experiment was designed to compare two otherwise identical workshop sessions that differed only in the territorial framing of the policy task: EU-level coordination versus local-level action (EU treatment vs. Local treatment). The sessions randomly allocated students to different groups to causally identify the effect of this difference in territorial framing (see Figure 1).[6]

The main difference between the EU treatment and the local treatment is the specific instructions given to each subgroup. Written instructions can be read in Figure 1. The EU treatment sub-groups were told they had been asked by the EU to "design" a policy to combat climate change, while the local treatment sub-groups were told they had been asked by a town council to "design" a policy to incentivise recycling among neighbours (which the EU gives funding for). Both treatments incorporate the EU in some way so that we keep that element constant. However, the relevant distinction lies in the scope of the policy that they are asked to design. While in the EU treatment the students had to think more globally and were told about "climate change" in broad terms, in the local treatment students were prompted to specifically think about recycling, which is a task managed locally by Catalan municipalities.[7]

Each session consisted of a 55/60-minute workshop with the school-group. The sessions proceeded as follows:

1. Beginning of the class. The first five to ten minutes were used to set up the classroom and answer the first baseline survey.

2. Students were randomly assigned to the in-class groups (level 2, 5 per school-group).[8]

3. Short introduction. 5 minutes: what is the EU?

6. In the pre-analysis plan, we aimed to have three groups, using the schools that were interested in the workshops but could not accommodate due to logistical reasons as a "control group". Following balance checks between respondents from these schools and the schools where the treatment was administered, we instead direct our focus to comparisons between the within-school treatment groups. We provide a further discussion of this deviation and the analysis that supports the decision in Appendix A.

7. Although the local treatment did not explicitly mention climate change, recycling is widely associated with pro-environmental attitudes and behaviours (Tobler, Visschers, and Siegrist 2012; Minton and Rose 1997; Ellen 1994).

8. Students were sorted in groups by choosing a number from a bag, which was in turn associated with a colour. Students who drew the same colour were assigned to the same group (cluster).

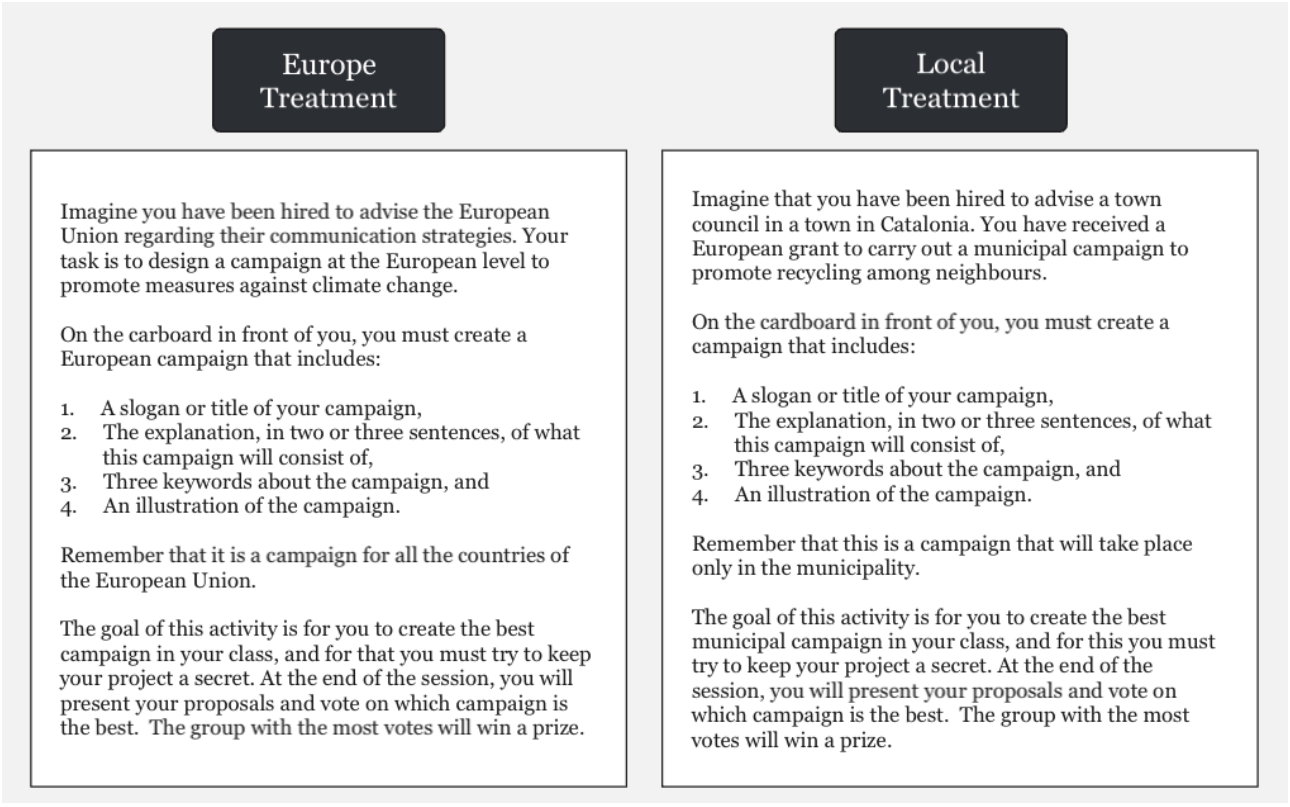
- In this short introductory part, students were told about the EU, laying some common ground so that they understood what it is and could participate in the workshop with some basic knowledge.

4. With the remaining time (approximately, 25-30 minutes), students worked in sub-groups.

   - Half the sub-groups randomly received the EU treatment, while the other half received the local treatment
   - Treatment instructions were administered through written text, which stated the importance of keeping their task a secret–if they wanted to win the competition.

Both sessions consisted of imagining a policy campaign. Each group was asked to create a slogan for a campaign/policy, develop the policy idea in a few sentences, summarise the policy in three keywords and draw a picture of their policy.

Figure 1: Treatment instructions given to the different treatment groups



Each sub-group had to write the slogan, the policy ideas, the keywords and the picture on an A3 paper size. A blank version of the poster boards was handed out by the instructors to each sub-group. The blank poster board had the same structure, but in the EU treatment group,

they saw an EU logo on the top-right, while the local treatment sub-group saw a simulated crest of a municipality, which did not feature any text.

5. After the sub-group activity, a second survey was distributed to each student to answer individually. Once the survey was answered and collected, the instructor collected all the materials, the sub-groups were dissolved and the class continued the session, which revolved around the role of EU institutions and the functioning and importance of EU elections.

6. Finally, during the last minutes of the sessions, all sub-groups presented their policy ideas to the class and students voted on which one they think is best, simulating an election with urns and ballots. The winners received a tote bag and a set of EU-themed playing cards, as part of the More in 24 campaign merchandise.

In the last survey, we asked students for permission and email addresses to send them one final optional survey two weeks after the workshop. Only around 50 students gave us their email addresses, of which only 8 answered. Therefore, although the plan was to examine the mid-term effect of the civic education experience, the number of responses is not great enough to do it.

In sum, Figure 2 shows the design of the experiment through the different time points.

Figure 2: Experimental design by treatment groups through time.

	EU Treatment	**Local Treatment**
T 0	Baseline survey	Baseline survey
	Intro about EU	
	Workshop: EU treatment	Workshop: local treatment
T 1	Final survey	Final survey

With only a few exceptions, each of the groups randomly created within the classroom was composed of five individuals.[9] Each group was physically distant from the rest and had to solve

9. We present balance statistics in Figure A6.

the activity as a group. This constituted a learning-by-doing activity, which means learning from experiences resulting directly from one's own actions, as contrasted with learning from watching others perform, reading others' instructions or descriptions, or listening to others' instructions or lectures.

4.1 Estimation strategy

We are interested in several outcome variables related to the EU and its role towards fighting climate change. Table 1 summarises these measures:

Table 1: Outcome variables

Variable	Survey question	Type	Range
EU knowledge	How much do you know about the EU?	Numerical	0 - 3
EU growth	Should the EU grow, incorporating new member states?	Numerical	0 - 2
EU membership	Is Spain's EU membership a good thing?	Numerical	0 - 5
EU Vote	How likely are you to vote in the European elections of 2024?	Numerical	0 - 10
Spain vs climate change	Is Spain doing enough to fight climate change?	Numerical	0 - 4
EU vs climate change	Is the EU doing enough to fight climate change?	Numerical	0 - 4
Climate change leader	Who should lead the fight against climate change, the EU or the states?	Numerical	0 - 4
Open text box	Number of words written about the EU in the open text box	Numerical	≥ 0

Because educational outcomes and political attitudes may systematically differ across types of school funding, all models additionally control for school type (public, semi-private, and private). Previous research shows that apparent differences in student outcomes across schools are partly driven by institutional characteristics and the student compo sition of each type of school (Cordero, Prior, and Simancas 2016).

Our empirical strategy follows a multilevel modelling approach. We estimate the between-school effects of the European and the local treatments using Bayesian hierarchical models with random intercepts for schools.[10] The model is specified as follows:

$$Y_i \sim \mathcal{N}(\mu_i, \sigma^2), \quad \mu_i = \beta_0 + \beta_1 \, Treatment_i + \gamma SchoolType_{s[i]} + u_{s[i]} \tag{1}$$

where Y_i is the outcome variable for student i, $Treatment_i$ is a binary indicator of whether

10. We rely on the `brms` library in R (Bürkner 2017) which uses `Stan` as a backend (Gelman, Lee, and Guo 2015) for all estimations.

the student received the EU treatment, $SchoolType_{s[i]}$ denotes a vector of indicators for school type, and $u_{s[i]} \sim \mathcal{N}(0, \tau^2)$ is a random intercept for the school s that student i belongs to.

We also estimate within-student changes in outcomes before and after the intervention using a similar Bayesian hierarchical structure:

$$y_{i,t+1} - y_{i,t} \sim \mathcal{N}(\delta_0 + \gamma SchoolType_{s[i]} + u_{s[i]}, \sigma^2) \tag{2}$$

Here, we model the change in outcome for student i from pre- to post-treatment, again including a random intercept $u_{s[i]}$ for school. This allows us to account for unobserved heterogeneity at the school level, while assuming no time-varying confounders affect the short interval between measurements. School type is included as a time-invariant covariate to account for structural differences across types of school funding.

Causal identification in the within-student models relies on the short time window between t and $t+1$ and the randomized assignment of students within classrooms, making the assumption of no other contemporaneous shocks plausible.

4.2 Text Analysis

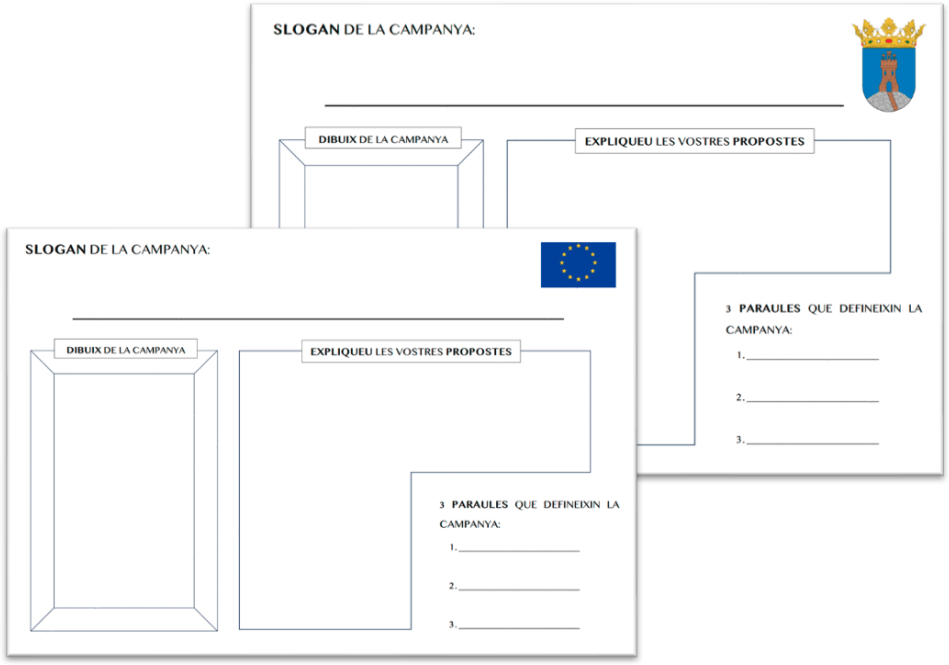
At the end of both the baseline and the post-group-activity questionnaires, we included a text-based open-ended response to allow students to reflect on the European Union. The question read as follows: "When you think about the European Union, what comes to mind?" In addition, as part of the sub-group activity, students had to write a slogan and briefly explain their proposal and keywords.

We leverage several Natural Language Processing (NLP) methods to examine differences in the ways in which students respond to the different treatments. First, we create structural topic models of the text using the transformers-based library `Bertopic` (Grootendorst 2022). This method is similarly intended to capture the underlying meaning and context of text or phrases. The method can perform particularly well in settings such as ours because we are able to include pre-trained multilingual embeddings from several different models. This method allows for providing a high-level overview of the primary topics that are addressed by the students.

Second, we rely on Rodriguez, Spirling, and Stewart (2023)'s embedding regression framework via the `conText` library, which allows for understanding the ways in which text–in our

case, from different treatment groups–has different meanings or contexts according to the authors. For example, Rodriguez, Spirling, and Stewart (2023) use the embedding regression framework to show how the word *immigration* has different semantic meanings and is therefore associated with different contexts according to Democrat and Republican legislators in the United States. We use this method to compare how the students understand climate change and Europe as a condition of treatment assignment (Figure 3 shows the design of the second part of the workshop, in which students wrote out their policy proposals).

Figure 3: Workshop Poster Design



4.3 Classroom Sessions

Our main study includes 868 individuals, sorted into local treatment (423) and EU treatment (445) groups (Figure A6 in Appendix C shows balance measures between both treatment groups across key covariates). The average age is 16 and 41% are men. No major problems were detected during the sessions, and many schools inquired about the possibility of hosting them again in the future. Regarding the workshops themselves, the experiment followed the protocol and did not experience any major disruptive events. The instructors were in charge of the sessions, although the teacher of the class was present and often played a more active role. We asked the instructors to codify all these instances, as well as any other potential deviation from

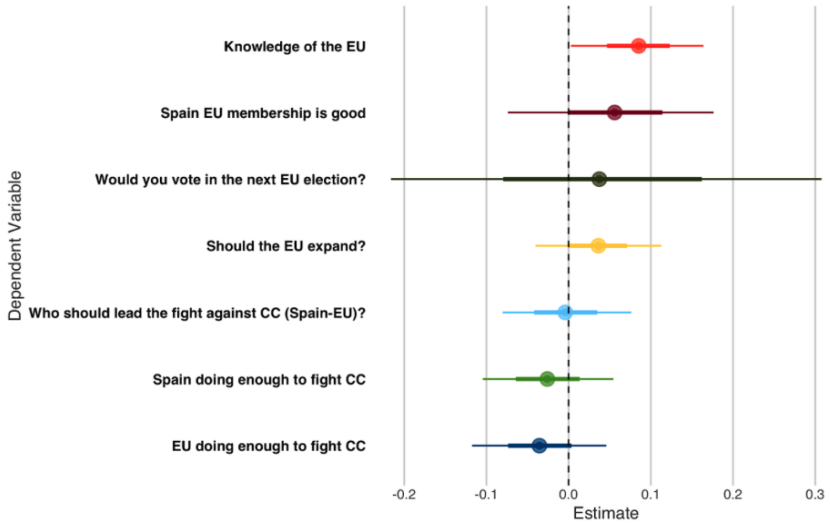
the protocol. As mentioned, they were all minor. Yet, we coded them and corroborated that our results do not vary significantly (you can find these additional analyses in Appendix E).

5 Results

5.1 Differential Effects of EU vs. Local Sessions

First, we compare the treatment groups against each other. Given that the two treatments were randomized, and as the balance statistics show, control variables would not be necessary. However, all models shown here include one important control: the school type (public, semi-private and private). We include this variable to account for systematic differences between school types that could influence baseline outcomes or responsiveness to the intervention.[11] We account for unobserved heterogeneity between schools using random intercepts. We present the results as a coefficient plot in Figure 4.

Figure 4: Estimated Effects of the European Union Workshop.



Note: Estimated coefficients represent the median estimate (point), and 1 and 1.96 standard deviations from the mean (66% and 95% credibility intervals) using a thick and thinner line, respectively.

As can be seen in the figure, most results do not meet conventional thresholds for statistical significance in the measured outcomes. That is, there are no significant differences between the students who were part of the EU treatment compared to the local treatment. The only

11. This variable increases the precision of the estimates. However, it does not change the substantive findings reported in the article.

exception is knowledge of the EU, which tends to be higher among the students who received the EU treatment compared to the local treatment. Looking at the rest of the effects, and as a generous interpretation, the local treatment appears to have slightly moved students' views on whether the EU or Spain should lead the fight against climate change, with these students seeing a larger role for Spain in relation to the students in the EU treatment group. Finally, one potential statistical explanation for these findings is that the EU treatment polarised attitudes, that is, it moved some students towards a pro-coordination scenario, while backlashed against others. Yet, the analyses do not substantiate this interepretation.

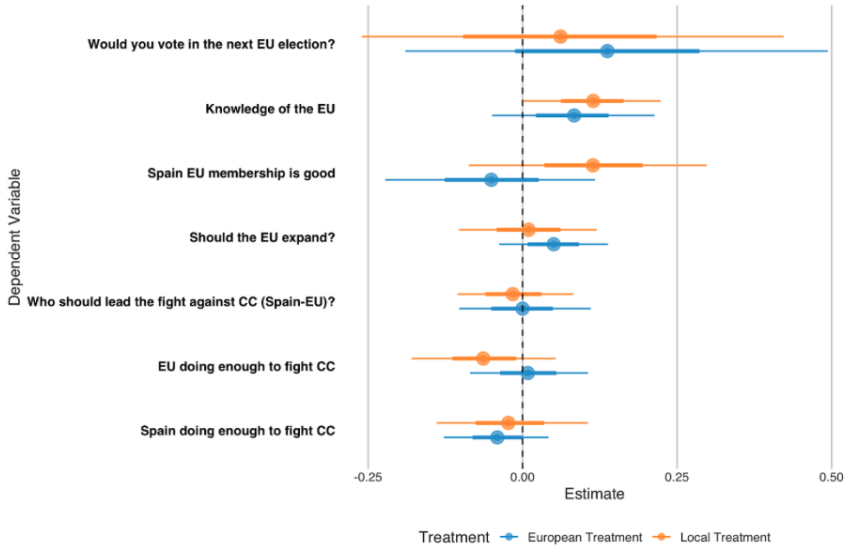
5.2 Changes within Students from the Intervention

As a second step, and taking advantage of the panel structure of the data, we analyse within-individual changes in the students' attitudes. Recall that students who participated in the workshops answered two surveys, one before the session started (baseline survey) and another one after taking part in the workshop.

Figure 5 shows the predicted differences in each of the outcome variables before and after the workshop. The estimated coefficients for the local treatment are represented with the colour orange, while the estimated coefficients for the EU treatment are represented by the colour blue.

The figure illustrates that, for each outcome variable, there were no statistically significant differences before and after the workshop for either treatment group. Nonetheless, there are some trends that are visible from the estimates. In both groups, the workshop had a positive–albeit not significant–effect on perceptions of EU knowledge, voting intentions, and support for EU expansion. Conversely, it had a negative–but again, not significant–impact on opinions regarding whether Spain is doing enough to combat climate change and on who should lead the fight against it. Notably, opinions on whether the EU is doing enough to address climate change slightly improved among individuals in the EU treatment group but slightly declined for those in the local treatment group, as anticipated. However, these changes were also not statistically significant. Regarding Spain's membership in the EU, only participants in the EU treatment group were negatively affected.

Figure 5: Estimated differences in outcome variables after the workshop by treatment

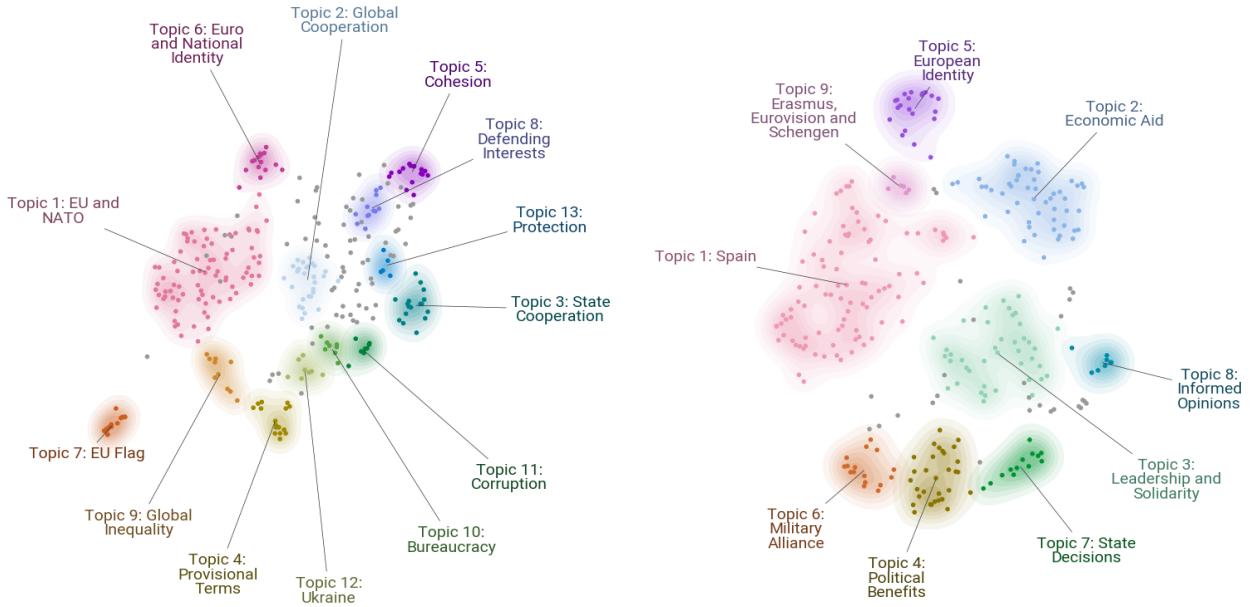


Note: Estimated coefficients represent the median estimate (point), and 1 and 1.96 standard deviations from the mean (66% and 95% credibility intervals) using a thick and thinner line, respectively.

5.3 Text Analysis

We first present the results from the topic models according to treatment assignment group. For the two groups that received the local and EU treatments, we use only the text that was provided following the treatment.

Figure 6: EU Treatment Group Topics



(a) EU Treatment Group Topics **(b)** Local Treatment Group Topics

Figure 6a and Figure 6b present the topic model results for the EU treatment group and the local treatment group, respectively. There are several key differences between the two results. First, the local number one topic in the EU treatment group is the EU and NATO, suggesting that the most common response from students receiving the EU treatment was related to the EU. In contrast, the number one topic in the local treatment group was Spain. Additionally, the EU treatment group topics appear to cover a wider range of EU issues. For example, this group identified global issues such as *Global Inequality* and *Ukraine*. Moreover, the EU treatment group highlighted National and European identity, which differs from the local treatment group. Another observation is that the EU treatment group topic model includes more topics than the local treatment group topic model. Despite holding constant a requirement that topics would be constructed using a minimum of five responses that could be grouped together, the EU treatment group had four more topics, suggesting greater diversity in the students' understandings of the EU following the EU treatment.[12]

In the second text analysis, we present the results from the embedding regression framework using the `ConText` library. The method includes first embedding the text and then using the embeddings in a multivariate regression framework. While the regression coefficients are not interpretable in a substantive sense, the estimated β's can be converted back to embeddings to understand how semantic meaning differs according to treatment assignment. We estimate two models, regressing *climate change* and *European Union* as the outcome variable on a treatment dummy indicator. In the case of the European Union, the semantic meaning differed from the control group for students receiving both treatments. However, meaning did not differ semantically from each other. We present these results in Appendix G.

In the analysis of *climate change*, meaningful differences emerge. After estimating the multivariate coefficients, we convert them back into embeddings. The nearest neighbours to each group's estimates are presented in Table 2. The results suggest that the students assigned different semantic meanings to climate change compared to the students receiving the local treatment. The EU treatment group positions climate change as an issue that *countries* or *states* can address *together* and *help* each other. In comparison, students receiving the local treatment associated climate change with *rules* and costs (e.g. *money*, likely being passed down

12. We provide further details about the topic models as well as a topic model based on the responses from the control group in Appendix F.

Table 2: Semantic Meaning of *climate change* by Treatment Group

EU Treatment Group		**Local Treatment Group**	
Feature	Value	Feature	Value
countries	0.742	*rules*	0.520
can	0.393	*money*	0.217
states	0.391	*think*	0.167
together	0.323	*things*	0.127
help	0.310	*make*	0.0983

Note: Value refers to cosine similarity. Higher values indicate greater similarity between a given word and the word's relationship with *climate change*.

by European or state authorities. We present further results from this analysis in Appendix G.

6 Conclusions & Discussion

This study provides a sobering picture regarding the effects of short educational workshops on young people's attitudes towards the EU. Using a field experiment implemented in different Catalan schools, we aimed to examine whether an educational learning-by-doing activity could convince students to favour a coordinated device—the European Union—to tackle a problem in need of cross-country coordination—climate change. In particular, we asked students to design a campaign on climate change for either a local council or for different countries across the European Union. Therefore, our design allows us to compare both treatment groups.

We found that the workshops were not a strong enough treatment to convince students that the EU could serve as a coordination device to fight climate change. Nonetheless, the analyses suggest that students who participated in the civic education programme reported somewhat higher levels of political information, and although not statistically significant, were marginally more likely to view Spain's EU membership positively, and were slightly more inclined to say they planned to participate in EU elections.

When comparing students across treatment groups, we observe that those in the EU treatment group tended to report more knowledge about the EU than those in the local treatment, although these effects do not meet conventional levels of statistical significance. This slight increase in EU knowledge can be interpreted as a validity check, suggesting that students were indeed affected by the intervention (albeit modestly). However, it was not enough to shift students' attitudes.

Results clearly indicate that the workshops did not persuade students that EU institutions should have a greater role in addressing climate change. Additional text analysis reveals that students exposed to the EU treatment attributed different semantic meanings to climate change compared to those in the local treatment group.

The causal evidence that we provide, therefore, suggests that this workshop–and potentially other similar workshops–may not go far enough to increase support for coordination at the EU level to address climate change. The 'hands-on' campaign activity, despite forcing students to consider the coordinated nature of climate change, did not change students' attitudes toward making the EU an important actor in dealing with such challenges.

There are at least two potential explanations for why the educational intervention amounted to null effects. First, it could be that the workshops, which in general were perceived as fun and educational by students, were too short to change their attitudes. A one-hour workshop on a topic that they know little about—the European Union—may not have been enough to create the connection between what the EU does or could do, and the importance of coordination. In addition, the topic of climate change is largely salient in media and political discourse, and students may hold pre-existing opinions that are resistant to change.

Second, the workshops took place in the lead-up to the 6-9 June 2024 European Parliament elections. Although young people's interest in politics and the campaign is generally lower, the events of the campaign could have altered the context and the effect of the field experiment.

With these caveats, we still believe that the findings reported here provide important evidence for civic education programmes. While these programmes may have other educational benefits besides what is studied here, if the goal is to change fundamental, likely ingrained social and political attitudes, these programmes probably need to devote more resources and time to achieve their goal.

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Part I
Appendix

Table of Contents

A Deviation from the Pre-Analysis Plan

The analysis presented in this article deviates from the pre-analysis plan in one major way. Our plan was to randomly select schools, using schools that were interested in participating in the workshop but were unable to find the necessary time to host trainers from *More in 24* as a control group by surveying this population. This design would have allowed for a pure control group against which we intended to estimate the effects of the two different treatments (EU and local). The school randomization process, however, failed, which is evidenced by considerable inbalance between student responses from the schools that agreed to participate and those that did not. Below, we go through the analysis using our original plan, highlighting the imbalances and presenting the results according to the PAP.

A.1 School Selection

The experimental design to implement the civic education lessons followed different steps. In the preparatory stage, we set selection criteria to consider potential schools that could be treated (in any of the two forms) or as a control. We relied on a database of schools that were identified as potential schools where the organisation could deliver civic education lessons. These schools had hosted a workshop with *More in 24* and hence had some connection with the organisers. We thoroughly checked the list by confirming their interest in participating and complemented it with other schools that had either expressed an interest in hosting workshops or that were similar to the schools already in the list.

Catalonia has more than 1,100 centres for secondary education,[13] scattered around the territory. Some schools are located far from the urban centres. Although almost all schools are accessible by public or private transport, for practical and budgetary reasons, we did not select institutions that were far from the main urban centres. In practical terms, the list of institutions considered schools located at around a 1 to 1.5-hour drive from either Barcelona or Girona. We excluded rural schools (schools in small towns where all students, regardless of their age, are in the same class), among others. In practice, this means that we created a list of schools mainly located along the coast and in big or mid-size cities, where most of the Catalan

13. This number does not mean there are more than 1,100 buildings. Some centres, despite being formally different, are in the same building.

population lives.[14] In total, our sample includes three private schools, eight public schools, and five semi-public schools (in Spanish, *escuela concertada*).[15]

We then randomly selected schools to be asked to participate in the campaign–to host the workshop and hence be part of our research. The protocol we followed was standardised. An email was sent to the institutional contact on the website of the Catalan Ministry of Education. If the email was not answered, we called the school two or three times and explained the project to them. If they answered the email or their response to our contact was positive, the next phase started, which consisted of setting the practicalities of the day and time to perform the workshop. If the school was willing to participate in the workshop, we sought to conduct the sessions in as many groups as possible. If, due to time constraints, this was not feasible, we asked the school to distribute the control survey to the class groups to which we were not able to give the workshop. Conversely, if the school was not interested or did not have the time to participate, they were automatically sent and asked to distribute a survey to be part of the control group. In total, this happened in two schools (a total of 56 individuals).[16]

14. More than 60% of the Catalan population lives in the metropolitan area along the coast. Private schools only represent 7.4% of the total schools.

15. A semi-public school is, in practice, a school funded by public institutions but run by private actors.

16. We contacted a total of 123 schools; however, due to the high rate of non-compliance, only a total of 14 schools agreed to host the workshop.

Figure A1: Map of high schools that agreed to host the workshop.

Note: Green arrows represent schools that implemented the workshop, and red arrows represent schools that were interested but did not implement it in the end.

The schools where the sessions took place can be seen in Figure A1. As can be seen, the sample comprises students from Catalonia, mainly from schools in the provinces of Girona and Barcelona, but some also from Lleida and Tarragona, and of ages between 14 and 19 years old.

Therefore, a random selection of schools was conducted, but a total of 77 schools did not answer, and 5 schools answered but decided that they did not want to host the sessions. Although noncompliance restricts our inferences at the school level, recall that we also randomised the treatment received by each of the subgroups that were formed at the beginning of the session. In this case, we will be comparing our treatment groups in two instances: EU treatment to local treatment and each treatment before and after having participated in the workshop.

Overall Impact of the Civic Education Workshop

We begin by comparing the effects of the civic education workshop by contrasting the post-treatment responses of individuals in the treatment groups with the responses from the control group. Ideally, we would compare both groups at the second time point; however, since it was not possible to collect two sets of responses from the control group, we took a two-step approach. First, we performed a Kruskal-Wallis (Kruskal and Wallis 1952) test to identify any significant differences between the control group and the baseline responses of treated individuals. Then, we used a regression analysis to assess the specific impact of the workshop, focusing on post-treatment outcomes. This approach helps us isolate the effect of the intervention despite the lack of repeated measures for the control group.

Table A1 shows the results of the Kruskal-Wallis tests performed for each of our outcomes of interest. Additionally, the table contains the pre-treatment means of each variable for both treatment groups, in order to understand the direction of the difference.

Table A1: Kruskal-Wallis Test results

Variable	Chi-Squared	p-value	Control mean	Treatment mean
Information about the EU	4.0994	0.0429*	1.155	1.077
Whether the EU should grow	4.1462	0.0417*	1.234	1.254
Who should lead the fight against climate change	1.3864	0.2390	2.086	2.137
Spain's EU Membership a good thing	0.7631	0.3824	4.023	3.970
Is Spain doing enough to fight climate change	4.9563	0.0260*	1.127	1.211
Is the EU doing enough to fight climate change	14.0700	0.0002***	1.318	1.466
Participation	0.6561	0.4179	6.713	6.785

+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 01

The results from the Kruskal-Wallis test reveal varying degrees of significance among the several outcome variables measured in relation to the treatment groups (either Control or Treatment, without taking into account the type of treatment). For the variables regarding information about the EU and whether the EU should grow, we observe statistically significant differences between the treatment and control groups, indicating that both groups had significant differences to begin with. In this case, individuals in the control group perceived higher knowledge of the EU than those placed in either of the Treatment groups. Similarly, the variable regarding Spain's role in fighting climate change also shows a significant difference, suggesting that opinions about Spain's efforts in combating climate change also varied significantly between groups, this time in the opposite direction.

Other variables that showed significant differences are the respondent's opinion on whether the EU or Spain are doing enough to fight climate change. Similarly to the previously discussed variables, opinion on whether the EU is doing enough to fight climate change is significantly more positive for individuals in the treatment group, while individuals in the control group have a more positive opinion on the role of Spain in fighting climate change.

In contrast, the variables about intended participation, Spain's membership in the EU, and who should lead the fight against climate change do not show significant differences between the groups, suggesting that these opinions were more consistent across treatment conditions.

Overall, these results highlight significant baseline differences in several key areas, indicating that participants in the treatment and control groups had differing perspectives prior to the civic education workshop. These differences provide a foundation for assessing the impact of the treatment in subsequent analyses.

Following the initial analysis, we proceed to evaluate the effect of the workshop through a series of regressions, the results of which are presented in Table A2. The analysis reveals a positive and statistically significant effect on two outcome variables: Spain's membership in the EU and Participation. However, to accurately disentangle the effect of the workshop from any potential pre-existing differences between treatment groups, it is essential to interpret these regression results in conjunction with the findings from the Kruskal-Wallis test results presented above.

Table A2: Civic education workshop effects on attitudes towards the EU

	EU info	EU growth	Leader against CC	Spain in the EU	Is Spain doing enough	EU doing enough	Participation
(Intercept)	1.020	0.931	2.693***	5.388***	0.053	2.599**	5.902*
	(0.670)	(0.934)	(0.687)	(1.017)	(0.843)	(0.792)	(2.849)
Treatment	−0.133	−0.140	−0.200	0.919***	0.226	−0.025	2.642***
	(0.239)	(0.124)	(0.179)	(0.237)	(0.158)	(0.180)	(0.758)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Num.Obs.	1018	1007	998	1023	1005	981	1028
R2	0.154	0.128	0.138	0.144	0.166	0.131	0.183
R2 Adj.	0.044	0.014	0.026	0.034	0.058	0.017	0.078
AIC	2296.3	2121.0	2119.6	3000.5	2109.2	2056.8	5244.1
BIC	2882.4	2700.9	2693.6	3587.2	2684.0	2618.9	5831.5
RMSE	0.66	0.62	0.62	0.93	0.62	0.61	2.76
Std.Errors	by: cluster_id	by: cluster_id	by: cluster_id	by: cluster_id	by: cluster_id	by: cluster_id	by: cluster_id

+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 01

Note: Clustered standard errors in parentheses.

Controls include: age, gender, nationality, workshop administrator, grade level, school and municipality.

The comparison between the Kruskal-Wallis test results and the regression analysis provides a nuanced view of how the treatment influenced various outcomes. The Kruskal-Wallis test assessed baseline differences between control and treatment groups before the treatment took effect, while the regression focused on post-treatment outcomes, comparing the control group with the treatment group after the intervention.

Specific variables differences found:

The Kruskal-Wallis test revealed a significant baseline difference between the control and treatment groups in their knowledge or opinions about the EU (p = 0.0429). However, the regression analysis shows that after treatment, this difference is no longer significant, with a treatment coefficient of -0.133. This suggests that the treatment may have leveled the initial disparity in this variable.

Similarly, for the variable measuring whether participants believe the EU should grow, the Kruskal-Wallis test indicated a significant difference between groups (p = 0.0417). Yet, the post-treatment regression shows no significant effect (coefficient -0.140), suggesting that the treatment may have diminished any initial differences in this opinion.

For opinions on who should lead the fight against climate change, neither the Kruskal-Wallis test (p = 0.2390) nor the regression (coefficient -0.200) showed significant differences.

This consistency implies that the treatment did not significantly influence participants' views on climate change leadership.

The variable assessing whether participants view Spain's EU membership positively showed no significant baseline difference in the Kruskal-Wallis test ($p = 0.3824$). However, the regression revealed a highly significant treatment effect, with a coefficient of 0.919* ($p < 0.001$), indicating that the treatment had a strong positive influence on participants' views about Spain's EU membership. This suggests that while no initial difference existed, the treatment led to a marked change in the treatment group's attitudes on this topic.

The Kruskal-Wallis test indicated a significant baseline difference ($p = 0.0260$) between groups on whether Spain is doing enough to combat climate change. However, this difference did not persist after treatment, as the regression shows no significant effect (coefficient 0.226). The treatment thus did not have a lasting impact on this opinion, despite the initial disparity.

There was a highly significant difference in the Kruskal-Wallis test ($p = 0.0002$) regarding whether participants felt the EU was doing enough to combat climate change. However, the regression shows no significant post-treatment difference (coefficient -0.025), suggesting that the treatment did not have a strong effect on changing this opinion, despite the significant baseline difference.

The Kruskal-Wallis test revealed no significant baseline difference in participants' likelihood of participation (p = 0.4179). However, the regression analysis shows a significant positive effect of the treatment on participation, with a coefficient of 2.642* ($p < 0.001$). This indicates that while the groups were initially similar, the treatment significantly increased participants' engagement or willingness to participate post-treatment.

The Kruskal-Wallis tests highlighted several significant baseline differences between control and treatment groups, particularly for variables such as *Information about the EU*, *Whether the EU should grow*, and *Whether Spain or the EU are doing enough to fight climate change.* However, the regression results reveal that these differences often disappeared after treatment, indicating that the intervention either reduced or eliminated disparities in these areas, indicating a significant impact on participants.

By integrating the insights from both the Kruskal-Wallis test and the regression models, we can draw several key conclusions. Regarding perceived knowledge about the EU, the dif-

ference found in the Kruskal-Wallis is neutralised after the treatment, which indicates that the civic education workshop had a positive effect, enough to eliminate the difference present pre-treatment. The same dynamic is at play regarding the respondent's opinion on whether Spain is doing enough to fight climate change.

On the contrary, the workshop has a negative effect on the respondent's opinion on EU expansion, eliminating the difference between treatment and control groups found in the Kruskal-Wallis test. Again, this dynamic repeats itself for the respondent's opinion on whether the EU is doing enough to fight climate change.

Finally, the only other significant differences found between the control and treatment groups are regarding intention to vote and opinion on Spain's EU membership. In these two cases, the Kruskal-Wallis test showed no significant differences between groups. However, after the workshop, individuals were more likely to report their willingness to participate in the EU elections, as well as to believe that Spain's EU membership is a good thing.

The variable regarding who should lead the fight against climate change presented no differences between treatments before the workshop, and remained so when the workshop ended.

On the other hand, for variables such as *Spain's EU membership* and *participation*, where no significant baseline differences were found, the regression shows that the treatment had a substantial post-treatment impact. This suggests that the treatment led to a significant positive shift in participants' attitudes and behaviours, especially in their views on Spain's EU membership and their likelihood of participating, even though these effects were not initially detected by the Kruskal-Wallis test.

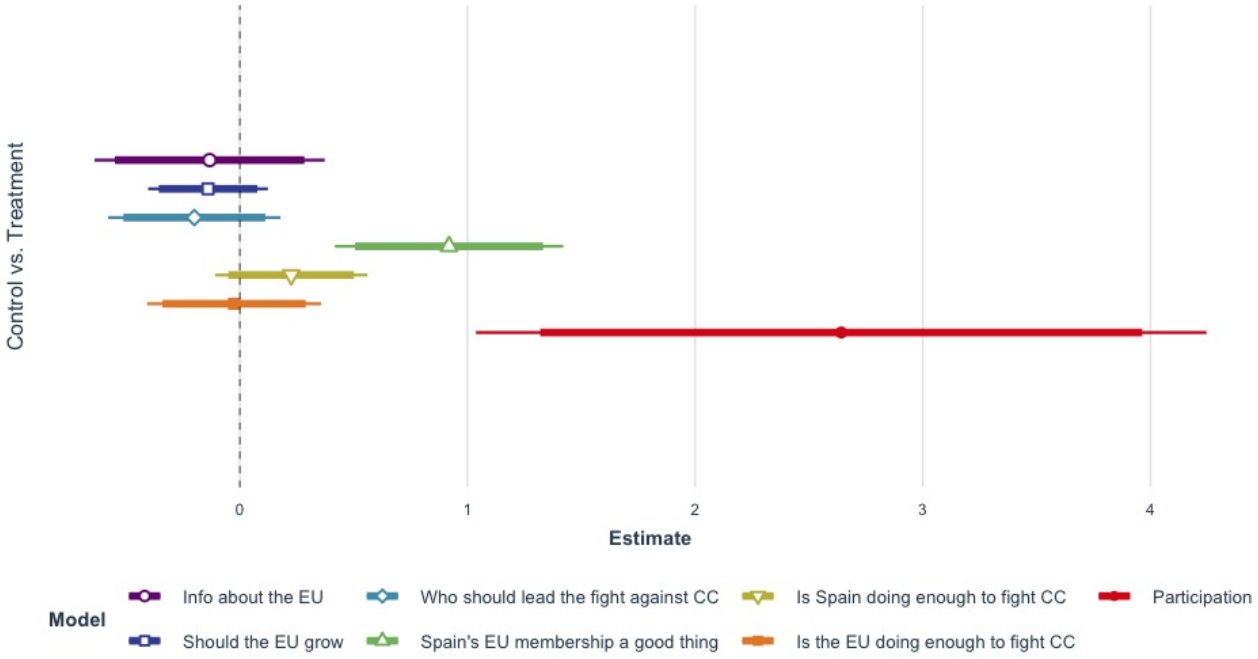
Overall, the treatment appears to have successfully influenced certain outcomes post-intervention, particularly in fostering positive attitudes towards Spain's EU membership and increasing participation, while reducing initial differences in other areas such as information about the EU, the belief that the EU should grow, or whether respondents think that the EU or Spain are doing enough to fight climate change.

Figure A2 shows how individuals who attended the workshop (independently of whether they were assigned the EU or the local treatment) were more willing to participate in the EU elections and to believe that Spain's membership in the EU is a good thing.[17]

17. Participation estimate is much larger only due to the scale in which this outcome is coded, which ranges from 0 to 10. The maximum number for the rest of the variables ranges from 3 to 5.

This shows that, overall, the workshop positively affected certain attitudes towards the European Union.

Figure A2: Workshop effects



B Summary statistics

Figure A3 shows the distribution of individuals based on some demographic features of our sample, and Figure A4 shows the distribution of observations through time since fieldwork started in March 2024.

Figure A3: Number of observations (individuals) by treatment group and school-year (top-left)**, age** (top-right)**, gender** (bottom-left) **and nationality** (bottom-right).

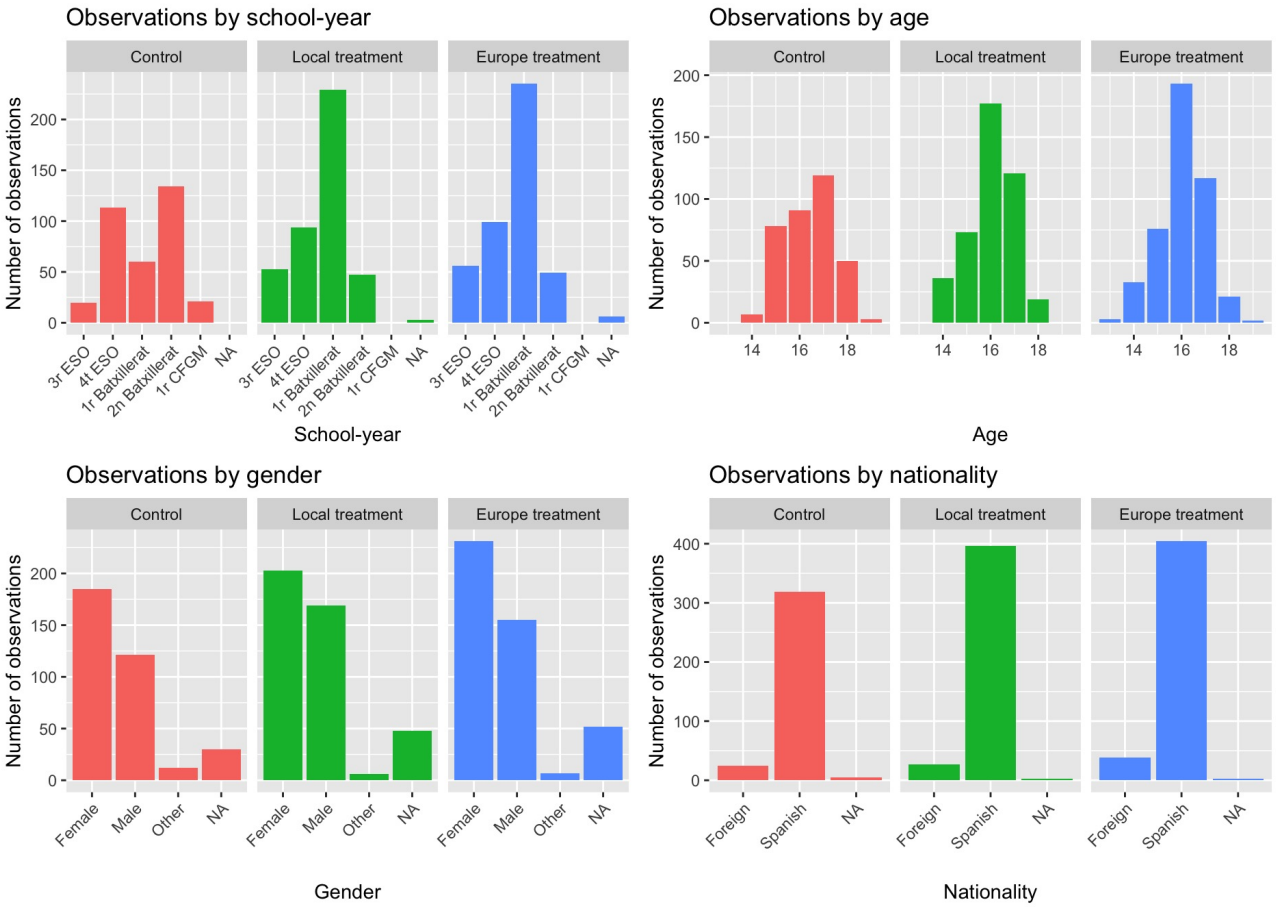
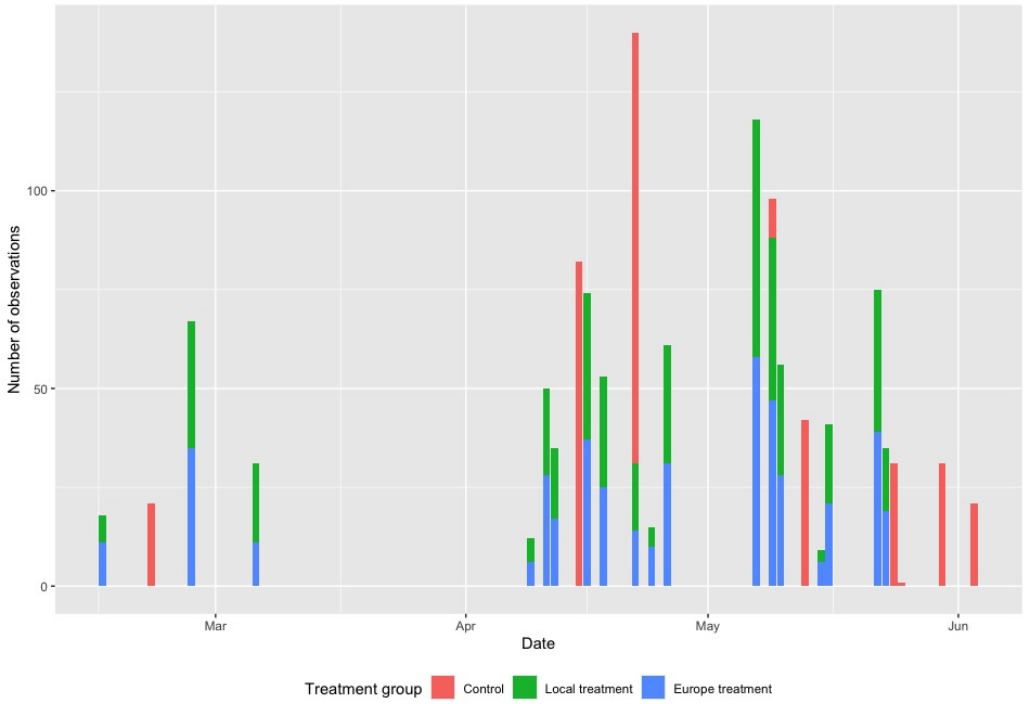


Figure A4: Observations by day and type of treatment assigned.



C Additional balance measures

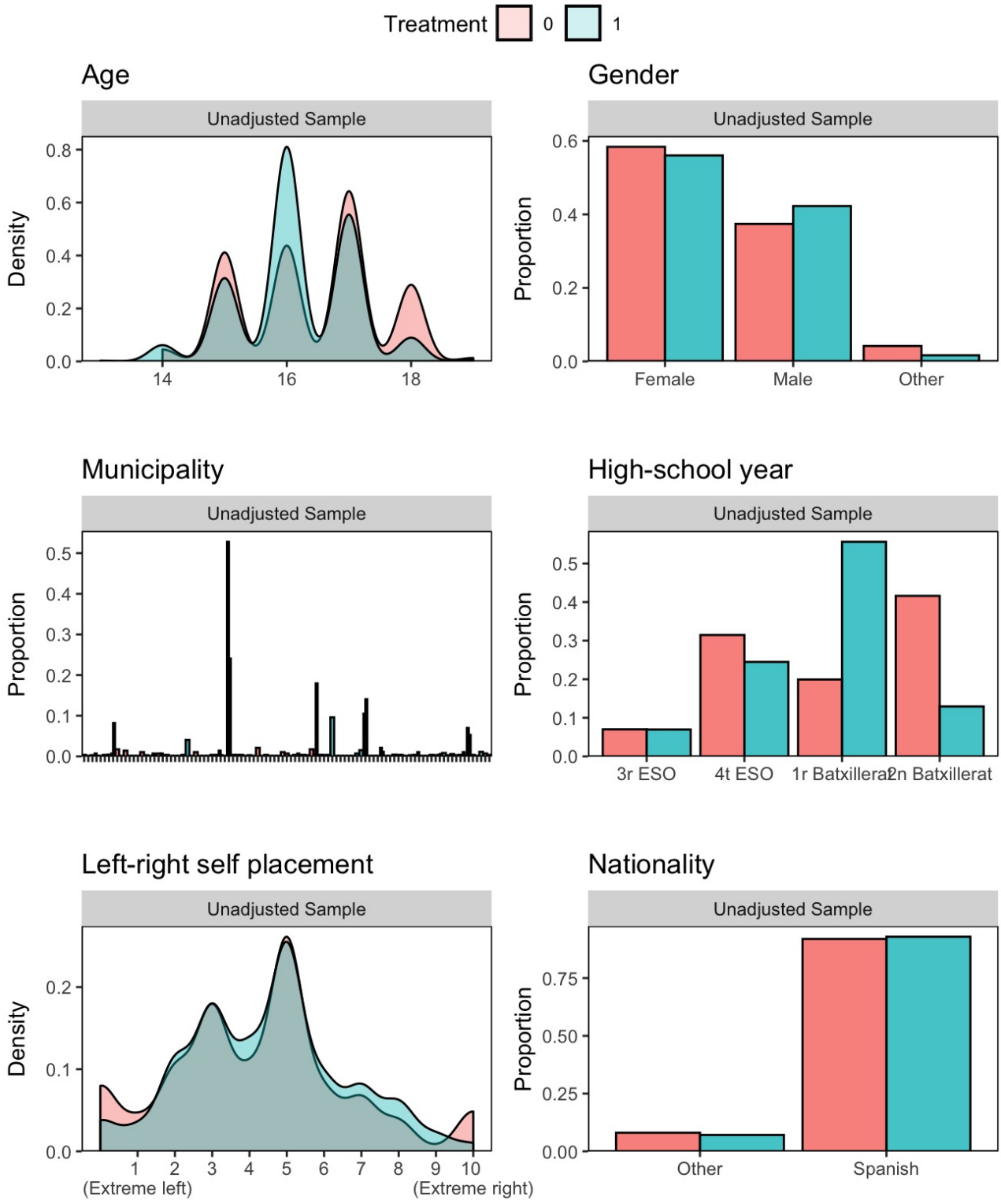
Figure A5 presents balance measures between the pooled treatment and control units. As shown, there are systematic and statistically significant differences across several covariates.

Participants in the control group —those who only completed the survey but did not attend the civic education workshop— tend to be significantly older, are distributed differently across school years, and are concentrated in different municipalities compared to the treatment group.

These consistent differences are likely the result of unsuccessful randomisation at the school level, which undermines comparability between the treatment and control groups. As a result, any evaluation of the workshop's effects using this full sample would be severely compromised. For this reason, we have excluded the control group from our main analysis.

In contrast, randomisation at the classroom level within the treatment sample appears to have been successful, yielding a balanced distribution of key covariates across subgroups (Figure A6). This balance provides a stronger foundation for assessing the causal impact of the different workshop contents.

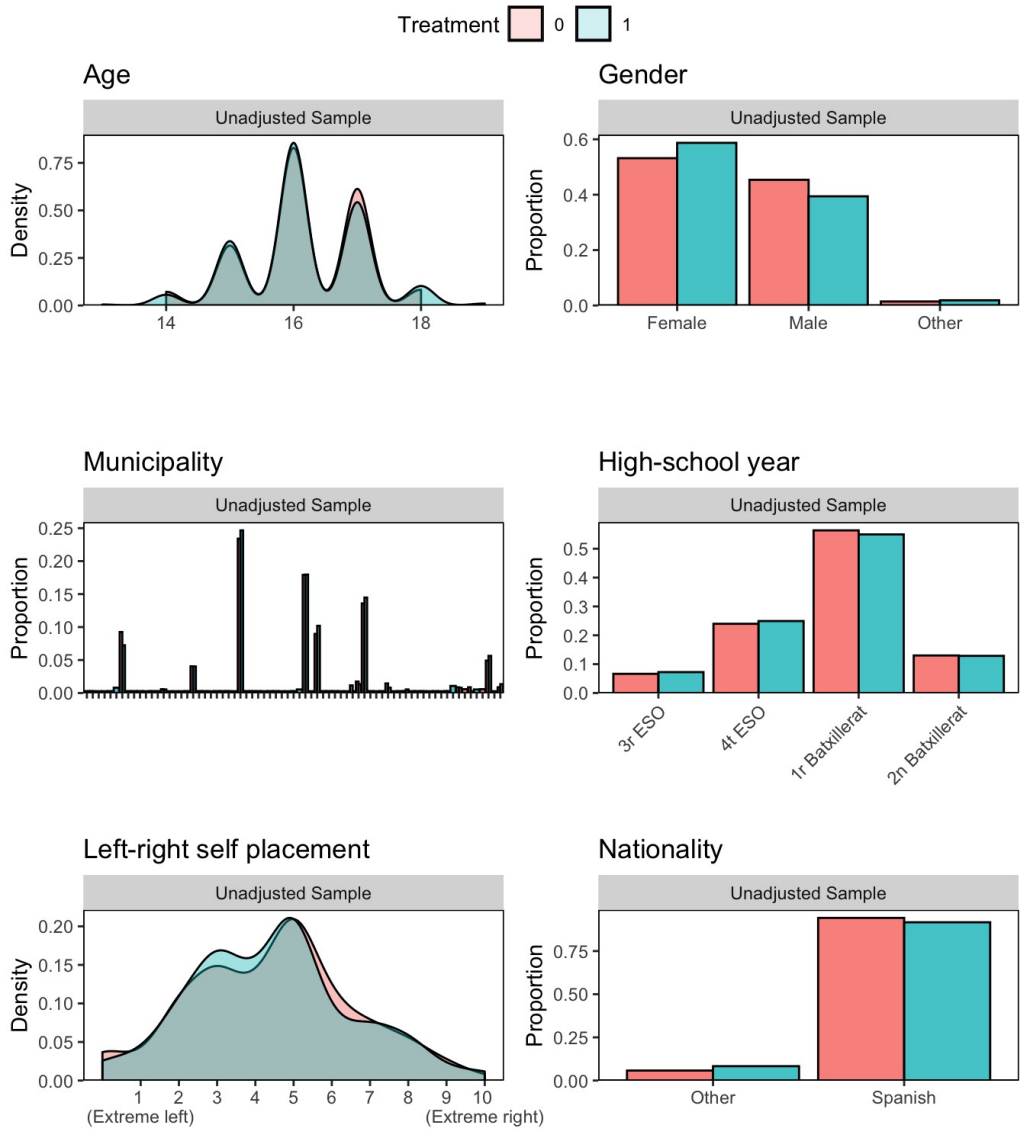
Figure A5: Balance results for Control group vs. Treatment groups.



Note: 0 as control and 1 as pooled treatments.

C.1 Balance between treatment groups

Figure A6: Balance diagnostics for both treatment groups across key covariates.



We see from Figure A6 that individuals are similarly distributed across groups for all covariates considered (age, gender, municipality, high-school year, left-right self-placement and nationality), which suggests a balanced allocation, consistent with successful randomisation at the classroom level.

D Regression tables

This set of model tables shows results for our first analysis. In it, we perform a First Difference study to compare the effects of the civic education workshop between treatment groups.

Tables show how results are mostly insignificant. However, they point to an increase in students' perception of their knowledge about the EU, as well as an improvement of their opinion on whether Spain is doing enough to fight climate change and on whether Spain's EU membership is a good thing.

Finally, participating in the EU treatment also increased their willingness to participate in the EU elections. However, it decreased individuals' beliefs that the EU should expand and worsened their opinion about the EU's role in fighting climate change.

The results slightly vary when we include the answer to each Dependent Variable pre-treatment as a control, which does not yield any significant results either.

Table A3: Within-arm first-difference estimates (European treatment)

DV	Median [66\% CrI]	Median [95\% CrI]	Pr($\Delta ¿ 0$)
EU doing enough to fight CC	-0.01 [-0.03, 0.02]	-0.01 [-0.07, 0.05]	0.418
Knowledge of the EU	0.04 [0.01, 0.07]	0.04 [-0.02, 0.09]	0.926
Should the EU expand?	0.03 [0.01, 0.06]	0.03 [-0.02, 0.08]	0.873
Spain EU membership is good	0.00 [-0.04, 0.05]	0.00 [-0.08, 0.10]	0.528
Spain doing enough to fight CC	-0.01 [-0.03, 0.02]	-0.01 [-0.06, 0.05]	0.433
Who should lead the fight against CC (Spain-EU)?	-0.02 [-0.04, 0.01]	-0.02 [-0.07, 0.04]	0.289
Would you vote in the next EU election?	0.03 [-0.05, 0.12]	0.03 [-0.15, 0.22]	0.649

Table A4: First Differences (FD) models comparing EU (1) vs local (0) treatments controlling by previous answer.

	EU info	EU growth	Leader against CC	Spain in the EU	Is Spain doing enough (CC)	Is the EU doing enough (CC)	Participation
EU treatment	0.016	−0.008	−0.007	−0.064	0.029	0.004	0.032
	(0.038)	(0.038)	(0.040)	(0.056)	(0.038)	(0.035)	(0.106)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Num.Obs.	696	666	684	709	705	675	727
R2	0.227	0.179	0.327	0.202	0.281	0.241	0.243
R2 Adj.	0.125	0.069	0.238	0.096	0.186	0.140	0.146
AIC	919.7	910.4	900.7	1531.9	941.3	894.0	2678.2
BIC	1297.0	1270.5	1271.9	1919.8	1324.1	1259.6	3068.2
RMSE	0.42	0.43	0.41	0.63	0.42	0.42	1.36
Std.Errors	by: cluster_id	by: cluster_id	by: cluster_id	by: cluster_id	by: cluster_id	by: cluster_id	by: cluster_id

+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 01

Note: Clustered standard errors in parentheses.

Controls include: age, gender, nationality, workshop administrator, grade level, school, municipality and previous DV answer.

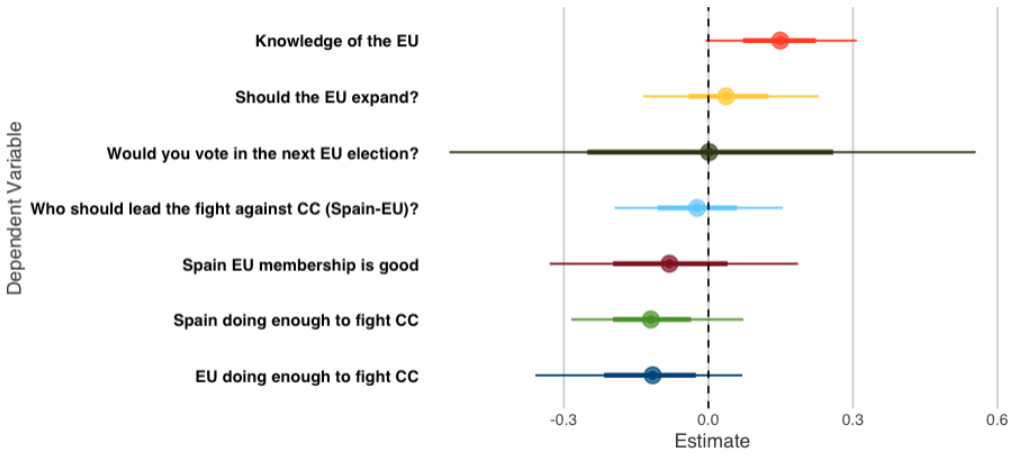
E Additional analysis controlling for session issues

As we mentioned during the methods section of the article, some of the sessions suffered slight deviations in terms of behaviour of the students or participation of teachers. Some school groups were more motivated while others were uninterested, and some teachers participated more than others.

To make sure these situations did not affect significantly the development, and therefore the effect, of the workshop, we ran the same models while controlling for these issues.

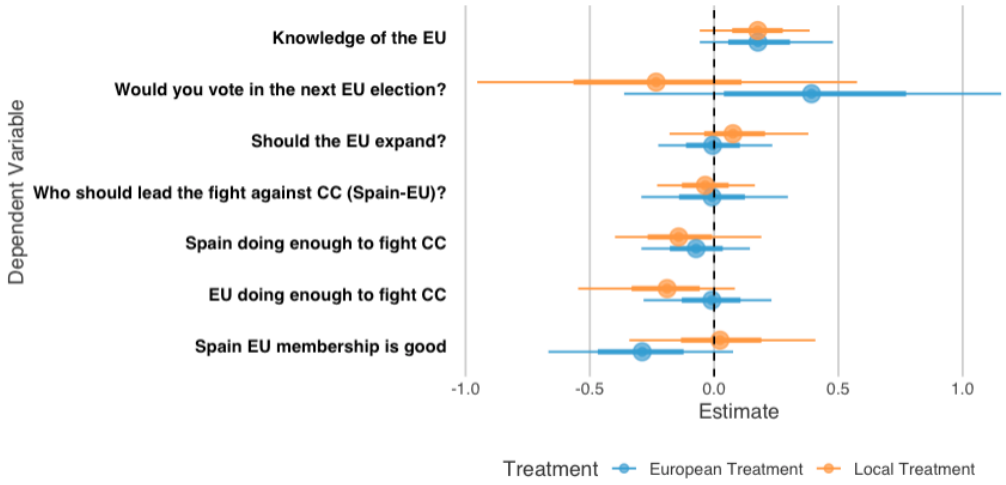
Figures A7 and A8 show the results of these tests. As can be seen, no major deviations from the original analyses are found.

Figure A7: Between effects controlling for classroom issues.



Note: Estimated coefficients represent the median estimate (point), and 1 and 1.96 standard deviations from the mean (66% and 95% credibility intervals) using a thick and thinner line, respectively.

Figure A8: Within effects controlling for classroom issues.

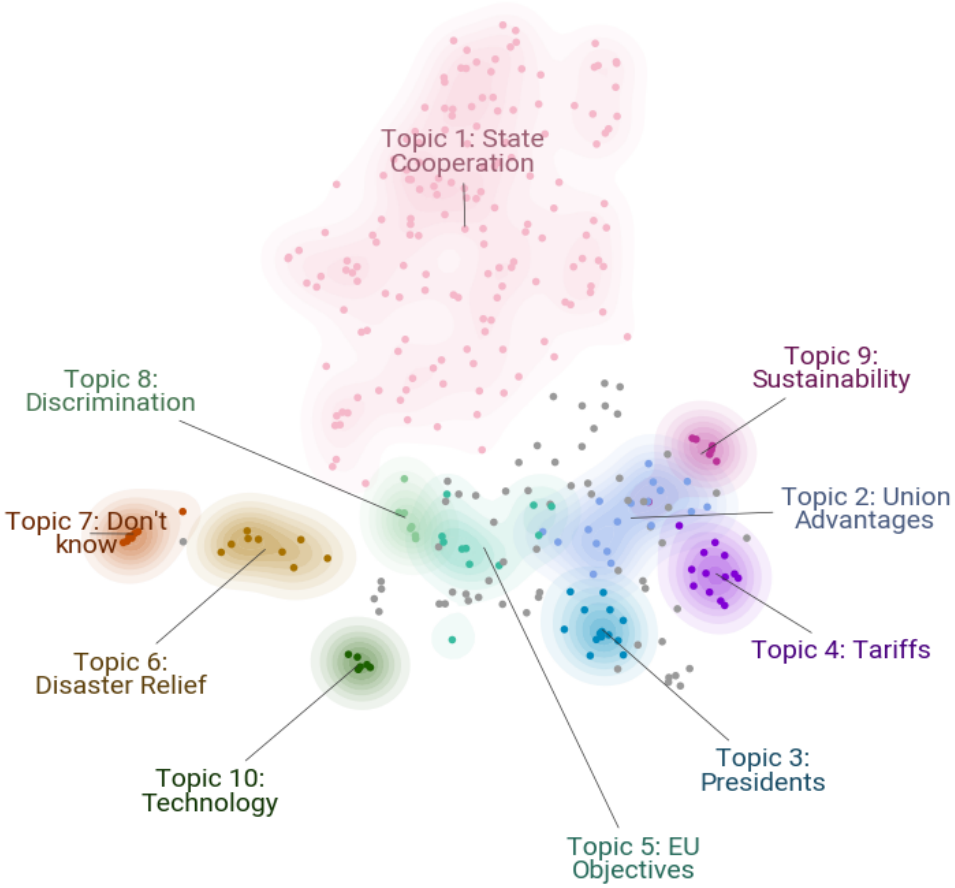


Note: Estimated coefficients represent the median estimate (point), and 1 and 1.96 standard deviations from the mean (66% and 95% credibility intervals) using a thick and thinner line, respectively.

F Topic Models

Topic models use a minimum topic size of 5 documents. All text was converted to English for the estimation.

Figure A9: Control Group EU Topics



G Embedding Regression

Table A5: Embedding Regression Results: *climate change*

Coefficient	Normed Estimate	Std error	lower CI	Upper CI
Treatment: Europe	-2.728334	7.830843	-20.17654	14.71987
Treatment: Local	12.964012	15.666839	-21.94388	47.87190

Table A6: Embedding Regression Results: *European Union*

Coefficient	Normed Estimate	Std error	Lower CI	Upper CI
Treatment: Europe	5.470146	2.193383	1.0921346	9.848157
Treatment: Local	5.950022	3.203631	-0.4444516	12.344496

H Effects of Workshop on Text Sentiment

We examine the extent to which the workshops affected the sentiment of the text responses provided by students. We estimate the effects of the workshops between the two types of workshops (Table A7) and within-student changes over time for both workshops (Table A8).

Table A7: Effects of Workshop on Sentiment (Between-student)

	Subjectivity	Polarity
Post-workshop (t=1)	−0.013 [−0.053, 0.027]	−0.022 [−0.053, 0.009]
Gender: Male	0.000 [−0.029, 0.029]	0.001 [−0.022, 0.023]
Gender: Other	0.158 [0.046, 0.271]	0.057 [−0.030, 0.144]
Age	0.018 [−0.003, 0.037]	0.002 [−0.012, 0.016]
European Treatment	0.011 [−0.027, 0.052]	−0.012 [−0.042, 0.018]
Post-workshop x European Treatment	−0.023 [−0.081, 0.033]	−0.014 [−0.058, 0.029]
Num.Obs.	1190	1190
R2	0.044	0.026
R2 Adj.	0.019	0.002
R2 Marg.	0.017	0.014
ICC	0.0	0.0
Log.Lik.	−39.301	290.420
ELPD	−55.1	276.0
ELPD s.e.	27.4	45.4
LOOIC	110.2	−552.1
LOOIC s.e.	54.7	90.9
WAIC	110.1	−552.2
RMSE	0.25	0.19

Table A8: Effects of Workshop on Sentiment (Within-student)

	Subjectivity Local	Polarity Local	Subjectivity European	Polarity European
Post-workshop (t=1)	−0.015 [−0.054, 0.024]	−0.022 [−0.052, 0.008]	−0.033 [−0.073, 0.008]	−0.036 [−0.066, −0.006]
Gender: Male	0.010 [−0.030, 0.051]	0.017 [−0.015, 0.047]	−0.010 [−0.052, 0.032]	−0.015 [−0.046, 0.016]
Gender: Other	−0.050 [−0.216, 0.108]	0.028 [−0.101, 0.156]	0.324 [0.171, 0.486]	0.076 [−0.040, 0.189]
Age	0.030 [0.002, 0.059]	0.009 [−0.012, 0.029]	0.009 [−0.016, 0.033]	−0.005 [−0.023, 0.014]
Num.Obs.	592	592	598	598
R2	0.080	0.025	0.054	0.031
R2 Adj.	0.050	−0.003	0.015	−0.010
R2 Marg.	0.018	0.013	0.039	0.020
ICC	0.1	0.0	0.0	0.0
Log.Lik.	−2.894	140.082	−21.870	151.704
ELPD	−14.8	129.7	−33.7	140.4
ELPD s.e.	18.5	34.6	20.1	30.1
LOOIC	29.7	−259.4	67.3	−280.9
LOOIC s.e.	36.9	69.1	40.3	60.1
WAIC	29.6	−259.4	67.2	−280.9
RMSE	0.24	0.19	0.25	0.19