

Article

## Just Adapt: Engaging Disadvantaged Young People in Planning for Climate Adaptation

Anna R. Davies \* and Stephan Hügel

Department of Geography, School of Natural Sciences, Trinity College Dublin, Dublin 2, Ireland;  
E-Mails: daviesa@tcd.ie (A.R.D.), shugel@tcd.ie (S.H.)

\* Corresponding author

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### Abstract

The visibility of young people in climate change debates has risen significantly since the inception of the Fridays for Future movement, but little is known about the diversity of positions, perspectives and experiences of young people in Ireland, especially with respect to climate change adaptation planning. To close this knowledge gap, this article first interrogates key emergent spaces of public participation within the arena of climate action in Ireland in order to identify the extent of young people's participation and whether any specific consideration is given to disadvantaged groups. It then tests the impacts of workshops specifically designed to support disadvantaged young people's engagement with climate change adaptation which were rolled out with a designated Delivering Equality of Opportunity in Schools (DEIS) school in inner-city Dublin, Ireland. We found limited attention to public participation in climate change adaptation planning generally, with even less consideration given to engaging young people from disadvantaged communities. However, positive impacts with respect to enhanced knowledge of climate change science and policy processes emerged following participation in the workshops, providing the bedrock for a greater sense of self-efficacy around future engagement with climate action amongst the young people involved. We conclude that what is needed to help ensure procedural justice around climate action in Ireland are specific, relevant and interactive educational interventions on the issue of climate change adaptation; interventions which are sensitive to matters of place and difference.

### Keywords

adaptation; climate change; education; Ireland; participation; young people

### Issue

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### 1. Introduction

In December 2018 a 15-year-old Swedish student, Greta Thunberg, addressed the UN climate change summit, COP24. She had risen to prominence following her initiation of a climate strike from school under the banner of Fridays for Future in August the same year. Her powerful speeches calling for an end to discussions and more science-based action on climate change were delivered throughout 2019 as youth-led climate strikes and marches inspired by her actions occurred globally. She

has played a significant role in reframing climate change as an inter-generational climate crisis within which young people have not only a vested interest, but also a right to participate in planning for climate action.

As stated in the UN Convention on the Rights of the Child (1990) every person under the age of 18 has the right to participate in the decision-making processes that impacts them. In research, such rights to participate in climate action are frequently articulated as one element of attaining procedural justice (e.g., the fairness of processes) in relation to the formation and implementation

of climate policy (Schlosberg, Collins, & Niemeyer, 2017) and, alongside distributional justice (e.g., fairness of outcomes), they are increasingly incorporated in strategies for a just transition to a decarbonised future (European Commission, 2019; ICTU, 2019). However, while participation can vary widely in form and function, the term is often used generically in climate change policy and practice (Hügel & Davies, 2020), with little effort made to evaluate the rules (e.g., social and regulatory) and tools (e.g., devices, mechanisms, methods and approaches) which shape participation and the skills and understandings required of those involved. As a result, both research and practice find that education can play a key role in supporting engagement with climate change (Cantell, Tolppanen, Aarnio-Linnanvuori, & Lehtonen, 2019; UNESCO, 2015), explaining how participation processes operate and providing training to ensure participants have the requisite capabilities to participate effectively. This does not mean that educational interventions on climate change will necessarily lead to wider participation in climate action and thus to greater procedural justice, particularly given wide variations in people's circumstances and identities (Allwood, 2020), but it is seen as a foundational element if fairness in the processes that resolve disputes and allocate resources to govern climate change is to be achieved.

Greta's role as a driver of climate activism amongst many thousands of young people is undeniable, but—as recognised in her speech at the UN Climate Action Summit in September 2019—she does not claim to represent the intersectional experiences of young people in relation to climate change globally. Research has begun to examine the diversity of young people's concerns, experiences and actions in relation to climate change, but it is embryonic (Dawson & Carson, 2020). Contributing to the expansion of this arena of climate change research, this article explores the engagement of young people from disadvantaged backgrounds with issues of climate adaptation planning in Ireland. Specifically, the article addresses two research questions: (1) To what extent have young people from disadvantaged backgrounds been included in climate adaptation planning in Ireland; and (2) what impacts do educational workshops have on young people's capabilities to participate in climate adaptation planning. As a result, the aims of this article are two-fold, first to identify the extent to which disadvantaged young people have been involved in climate adaptation planning in Ireland, and second to examine the impacts of an educational intervention focused on building capacities amongst disadvantaged young people to engage with climate change adaptation planning.

To achieve its aims, this article builds on findings from a rapid survey of young people's questions about climate change undertaken during climate marches in Dublin in 2019 (Davies & Hügel, 2019), which found that young people wanted more education on climate change science and policy, and more recognition of their voices

and opinions in policy decisions. Following a review of existing research and an explanation of the methods employed, we interrogate the place of young people, and specifically those from disadvantaged areas, in key spaces of public participation related to climate action in Ireland. We then discuss a suite of place-based interactive workshops designed to engage young people with ideas of adaptation planning. Finally, we reflect on the benefits and limitations of such place-based interactive workshops, arguing for a re-examination of how climate change and action is provided in schools and, drawing on the work of Osborne (2015), for greater sensitivity to difference when seeking to enact a just transition to a decarbonised future.

## 2. Background

It is widely recognised that disadvantaged communities experience heightened risk from climate change and need to be better engaged in decisions about adaptation to achieve a just transition to a decarbonised future (Davies, Hooks, Knox-Hayes, & Liévanos, 2020). However, public participation in climate change adaptation planning is often limited in practice (Hügel & Davies, 2020). In response, an expanding stream of research is exploring ways to increase the capacities, resources and agency of young people (Börner, Kraftl, & Giatti, 2020; Hansen et al., 2013; Haynes & Tanner, 2015), with Osborne (2015) making a powerful argument that in order to understand vulnerability to climate change it is necessary to incorporate not only the multiple factors that shape identity and power, but also the intersectionality of these factors. In particular contexts researchers have sought to improve the adaptive capacities of 'at risk' youth communities in relation to climate change (see Haynes & Tanner, 2015), but calls for greater youth participation—and particularly participation amongst disadvantaged groups—in adaptation planning remain (e.g., Treichel, 2020). Researchers are keen to move beyond rhetoric which characterizes seeing young people as only 'victims,' and to highlight the important roles they play in shaping society through the expression of their views and as everyday change agents (Börner et al., 2020). While they are unable to vote, young people through their social practices, whether that is eating, heating or protesting, can affect their localities.

Place-based interventions are increasingly seen as important in this regard because they focus on "what matters to people and what they care about" (Amundsen, 2015, p. 258), overcoming perceptions of psychological distance that have affected engagement with climate change (Scannell & Gifford, 2013, p. 3). However, attachment to place amongst young people in vulnerable or disadvantaged areas can be ambivalent and fragile. In this regard, further empirical research is needed to explore appropriate means and mechanisms of place-based, educational engagement with

disadvantaged groups, particularly in relation to digital technologies (Bowman, 2019).

It is increasingly recognised that young people's concerns about, and actions in relation to, climate change are diverse and demand nuanced and appropriate forms of education that go beyond providing information about the climate system, to include discussion of decision making, power and [in]justice within society, particularly in relation to local contexts and personal experiences (Bowman, 2019; O'Brien, Selboe, & Hayward, 2018). Indeed, O'Brien et al. (2018, p. 8) argue that such education provides opportunities for deepening democracy which "is essential to challenging the assumptions and interests that maintain business as usual and for developing strategies and actions that directly confront those with vested interests in systems and structures that perpetuate climate change and social inequality." Yet the education sector remains a relatively untapped opportunity to combat climate change in this regard internationally, particularly education with respect to adaptation planning amongst disadvantaged communities.

Ireland is selected as the focus for this article as it has been shown to be a laggard with respect to taking climate action within a European context (Burck, Hagen, Höhne, Nascimento, & Bals, 2020), particularly in relation to adaptation and despite being lauded for its national citizens assembly on climate change held in 2017 (see Devaney, Torney, Brereton, & Coleman, 2020). In the case of Dublin, adaptation baselines identified in local climate action plans (Dublin City Council & Codema, 2020) found that climate change was already having an impact and that those impacts were likely to increase in the future. Specifically, the average sea level in Dublin Bay is rising faster than initially forecasted and has risen by twice the global average in the last 20 years. The number of days with heavy rainfall has also increased, as has the number of extreme flooding events (Dublin City Council & Codema, 2020). The precise location for the research in inner-city Dublin was selected because it is vulnerable to pluvial, fluvial and coastal flooding, which is predicted to increase under conditions of climate change, and it is recognised by government as a site of socioeconomic disadvantage. The research was conducted with a designated DEIS (Delivering Equality of Opportunity in Schools) school. The DEIS scheme was developed to provide better opportunities for those in communities at risk of disadvantage and social exclusion (Department of Education, 2017). Disadvantage in this context is defined as "impediments to education arising from social or economic disadvantage which prevent students from deriving appropriate benefit from education in schools" (Department of Education, 2017, p. 4). All schools in Ireland are assessed in terms of the socioeconomic background of their pupil cohort using centrally held data from the Department of Education Database and Central Statistics Office Small Area Statistics, to identify those schools which require the greatest level of support. We selected the Transition Year cohort (students

aged 15 to 16) to work with because each school is able to design its own Transition Year programme, within guidelines, to suit the needs and interests of its students. This gives flexibility and space for new topics—space which is not available within the curriculum for second level Junior and Leaving Certificate programmes. It was also seen as a particularly pertinent lifestage for participants as the cohort is approaching the Irish voting age of 18.

### 3. Methods

This article draws its empirical evidence first from a review of processes and spaces for engagement in climate action in Ireland, specifically focusing on the attention that has been given to disadvantaged young people within them. The review answers research question: (1) To what extent have young people from disadvantaged backgrounds been included in climate adaptation planning in Ireland? It then draws on a series of specifically-designed workshops with Transition Year students delivered in a school setting and involving attitudinal surveys, presentations, discussion points and interactive exercises which generate data to respond to the second research question: (2) What impacts do educational workshops have on young people's capabilities to participate in climate adaptation planning?

#### 3.1. Review

A narrative review (Hoggart, Lees, & Davies, 2002) of statutory planning guidelines for engaging young people in the development of climate action policy and plans in Ireland was conducted. Within this, explicit searches were conducted to identify any reference to 'disadvantage' and 'young people.' Additional searches of all 1,185 submissions, including 153 group submissions (from non-governmental organisations, sectoral interests and representative groups), to the Citizens Assembly were also conducted (see <https://2016-2018.citizensassembly.ie/en/Submissions>). However, the nature of the submission portal means it is not possible to identify the age of individuals submitting and from organizational submissions just three were from youth representative groups: The National Youth Council of Ireland; ECO-UNESCO and Young Friends of the Earth. These submissions were searched for the keywords again with relevant content identified and interrogated. Given the low number of youth submissions and the lack of statutory attention to disadvantaged young people, additional climate change-related initiatives from leading youth-focused groups in Ireland—The National Youth Council of Ireland and 31 *Comhairle na nÓg* (local Irish youth councils)—were also examined for references to disadvantaged youth participation and adaptation. In each case emails were exchanged with personnel in the organisations examined to ensure coverage of information and actions.

### 3.2. Workshops

The second data collection point was a series of place-based workshops conducted at a secondary school in an inner-city location in Dublin with their current Transition Year cohort. Six sessions were conducted between March and May 2019. The school was chosen as it is the only secondary school situated in an area of Dublin that has experienced multiple serious flood events of all three types (coastal, fluvial, and pluvial) in the past 20 years. We, the authors, designed and delivered the workshops during the normal school day, with teachers and classroom assistants present. The workshops were structured to fit into the classroom environment and timetable, providing information and opportunities for discussion, as well as interactive exercises for experiential learning (Suarez, Mendler de Suarez, Koelle, & Boykoff, 2014) and opportunities to apply subject knowledge in the form of participant presentations in a familiar learning environment. The same cohort—a single class—attended each workshop, though there was a degree of intra-workshop variation due to absenteeism. Consent was obtained from the participants before the workshops commenced, outlining (1) the purpose and scope of the project, (2) the data that would be collected, and (3) allowing members of the cohort to opt out or withdraw at any time. The outline content of each of the sessions is shown in Table 1. In addition to the attitudinal surveys outlined below, notes were taken during and after each workshop session to record experiences and conversations that took

place in the classrooms. A record was also kept of activities conducted in each of the two interactive exercises.

### 3.3. Survey

A survey ( $n = 25$ ) was run twice: before the first workshop, and after the second workshop. Table 2 details the questions asked in the attitudinal survey and response options (with a response scale ranging from 1 to 5, with 1 denoting strong disagreement and 5 denoting strong agreement) for these questions. As the sample sizes were small and the data are not normally distributed, non-parametric tests were used to analyse the responses. The Mann Whitney U (Wilcoxon Rank Sum) test was conducted. Survey questions were selected based on those in the British Social Attitudes 35 “Climate Change” chapter (Fisher, Fitzgerald, & Poortinga, 2018). The survey was selected as a robust means to quickly and quantitatively identify and compare key dimensions of participants’ attitudes and awareness of climate change both before and after the workshops. They provide a different and complementary form of knowledge compared to the qualitative notes of discussions and interactive exercises collated during the workshops themselves (Hoggart et al., 2002).

## 4. Results and Discussion

This section first identifies the extent to which disadvantaged young people feature in climate adaptation

**Table 1.** Workshop content outline.

Session	Content	Key data collection points
1	Introduction: <ul style="list-style-type: none"> <li>• To research team and project</li> <li>• To climate change</li> </ul>	<ul style="list-style-type: none"> <li>• Pre-workshop attitudinal survey</li> <li>• Interactive exercise: Online images of climate change</li> </ul>
2	History: <ul style="list-style-type: none"> <li>• History of Ringsend</li> <li>• Flooding in Ringsend</li> </ul>	<ul style="list-style-type: none"> <li>• Recap and discussion of interactive exercise results from Session 1</li> </ul>
3	Present: <ul style="list-style-type: none"> <li>• Types of flooding</li> <li>• Sensing floods</li> <li>• Defending floods</li> <li>• Forecasting floods</li> </ul>	<ul style="list-style-type: none"> <li>• Interactive exercise: Flood mapping: will your home be flooded?</li> </ul>
4	Future: <ul style="list-style-type: none"> <li>• Flood adaptation approaches</li> <li>• Reducing vulnerability</li> <li>• Types of adaptive interventions</li> </ul>	<ul style="list-style-type: none"> <li>• Recap and discussion of interactive exercise from Session 3</li> </ul>
5	Field trip: <ul style="list-style-type: none"> <li>• Climate action visitor experience</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
6	Wrap up: <ul style="list-style-type: none"> <li>• Group presentations</li> </ul>	<ul style="list-style-type: none"> <li>• Post-workshop attitudinal survey</li> </ul>

planning in Ireland, and then examines the impacts of educational workshops focused on building capacities amongst disadvantaged young people to engage with climate change adaptation planning.

#### 4.1. Climate Change Participation Policies and Practices

In Ireland, Section 13 of the Planning and Development (Amendment) Act 2010 (2010), which amended Section 20 of Planning and Development Act 2000, states that young people (or groups or associations representing them), are entitled to make submissions or observations on local area plans, including climate action plans (Department of Environment, Climate and Communications, 2019a). Such statutory regulation acknowledges that this requires planning authorities to be innovative and engage actively with young people, particularly through voluntary initiatives, such as the Green Schools programme. This programme, operated and coordinated by the Environmental Education Unit of the non-governmental organization An Taisce, promotes long-term, whole-school action for the environment. However, participation in the Green Schools initiative is reliant on sufficient interest and commitment amongst teachers and the school's Principal to register for the scheme and initiative activities. Equally, the Green Schools initiative does not yet offer a dedicated climate change theme in their programme, and where activities in other themes—such as transport or energy—relate to climate change, it is focused on mitigation actions with little attention given to adaptation issues. Young people's interests may also be represented by community groups, but only if those groups exist and engage with Local Community Development Committees or Public Participation Networks who then participate in local climate action planning. However, Dublin's Climate Action Regional Office have engaged directly with Dublin youth councils (*Comhairle na nÓg*) in both 2019 and 2020, giving presentations on climate science, climate impacts and climate action, but without specific focus on inequalities or disadvantaged communities. This may change in the future as the Department of Environment, Climate and Communications states that "the Government is working with the CAROs [Dublin's Climate Action Regional Offices] to identify the most vulnerable areas and population groups to ensure assistance and support is delivered where it is needed most" (Department of Environment, Climate and Communications, 2019b).

Ireland has gained international plaudits for its citizens' assembly on climate change (Cahillane, 2020), with its 99 members representative of gender, location, and social class in the country (Leahy, 2017), at least of citizens who are eligible to vote (i.e., over 18). Young people under 18 and their representative groups were able to submit to the pre-assembly deliberations however and three youth bodies did so: The National Youth Council, ECO-UNESCO and Young Friends of the

Earth. The National Youth Council—a national organisation which represents and supports community, voluntary and not for profit youth organisations in Ireland—made a series of recommendations, particularly exalting the place of critical thinking in education. Relevant to the research questions in this article, education was seen as a key route through which young people can be supported to tackle interlinked climate change and global justice issues and how they relate to their everyday lives. Key statements from the National Youth Council were "to recognise young people as active global citizens," and "to adequately resource education to empower young people to analyse, reflect on and challenge decisions related to climate change" (National Youth Council, 2017, p. 4). However, matters of inequalities are articulated globally rather than within Ireland, and while reference to "the future" is made, there is no explicit mention of adaptation.

A similar story is replicated in the submission from ECO-UNESCO, a youth-focused environmental education organisation. Adaptation is not mentioned, but education is recognised as having a "key role" in climate change action (ECO-UNESCO, 2017, p. 5). In their submission, ECO-UNESCO include the results of a survey they conducted with young people. The majority of these responses focus on mitigation actions and related behavioural changes that will need to be adopted to reduce emissions. Others highlight the lack of space for engagement opportunities for young people to get involved in policy making (ECO-UNESCO, 2017, p. 11), but matters of disadvantage, inequality and justice are not explicitly mentioned.

Young Friends of the Earth—a voluntary activist group working to advance global climate justice by mobilising and inspiring people to join the movement in Ireland—has a wider age remit than both the National Youth Council and ECO-UNESCO, with members aged between 17 and 40. Their submission focuses predominantly on mitigation "to avoid the worst effects of climate change," rather than adapting to the inevitable changes that will occur even if Ireland's ambitious targets are met. They do, however, call for flood risk plans for every county in Ireland, rain gardens and other soft engineering options to reduce flooding now and in the future. They also identify that more funding and power needs to be allocated to local authorities in order to implement climate action plans (including both mitigation and adaptation).

One youth group that did not submit to the citizens assembly, but which has been active in relation to youth engagement with climate change is *Comhairle na nÓg*, a collective body of youth councils that operates in 31 local authorities across Ireland. In the Dublin *Comhairle na nÓg* there are 63 elected members between the ages of eleven and 18 who come from the five administrative areas of Dublin City. Within this, eight places are held for what they refer to as 'seldom-heard young people' from marginalised or vulnerable contexts. Each year the young

people involved identify, prioritise and progress topics of importance to them. In 2019 participants had the opportunity to cast their vote in the *Dáil* (Government) Chamber and set out a climate change agenda for the *Comhairle na nÓg* National Executive to lead on until 2021. Once again, the focus of this work was set squarely in the space of mitigation.

Overall, despite a context of burgeoning engagement with climate action in Ireland, there remains limited articulation of adaptation to climate change and the role that public participation might play in that. Nor are the differentiated identities and situations of young people in Ireland, and how those identities and situations might affect participation or climate action, discussed. In response, place-based workshops (Table 1) were developed and conducted within a second level DEIS designated school in a socioeconomically disadvantaged area of inner-city Dublin. The area where the workshops took place experiences multiple pressures, being vulnerable to current and future climate change effects (particularly sea level rise and flooding) and facing negative impacts from persistent socioeconomic deprivation on the one hand and gentrification on the other.

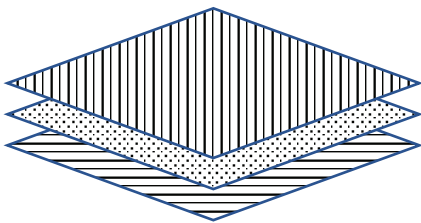
#### 4.2. Adaptation Workshops: Flood Resilience

In Session 1, the participating students first completed an anonymous attitudinal questionnaire to establish their views about climate change and its impacts, as well as indicating their awareness of climate change adaptation (see Table 2 for results). While a small sample, these results do align with the findings of other studies that adaptation is the poor relation within climate action and awareness of adaptation is weak within publics (Hügel & Davies, 2020). They also suggest that there is some level of technical optimism amongst the cohort that technology and gaming could provide supports for enhanced engagement with matters of climate change. Following the questionnaire, the students were given an introductory presentation on the science and politics of climate change. Specific emphasis was placed on the issue of adaptation and the need to plan for long-term effects of climate change. To initiate discussions, students were encouraged to imagine and talk about what they thought their area would look like in 2050. This discussion revealed a wariness of thinking about such distant futures, and elicited responses that were very much rooted in current power geometries the participants experienced in the present. In particular, one participant felt that they would no longer be living in the area as it would be ‘Google-land,’ referencing the influence of the dense cluster of tech-based companies which operate adjacent to their neighbourhood and which have led to processes of gentrification in the locality (Cardullo & Kitchin, 2018). This raised other discussion points amongst the class, first regarding matters of persistent intra-generational and inter-generational injustice around basic services, including access to afford-

able housing, and second, their position on the cusp of voting age in Ireland and their perspectives on the powers that this would (or would not) give them to affect change in their local area and nationally. We were then able to link these debates to matters of climate (in)justice and the differentiated experiences of climate change and its effects internationally. Building on this, the session concluded with an interactive exercise where students were asked to use internet search engines to identify and collate images that were tagged under the search term ‘climate change’ to be used as an entry point for a discussion about how climate change is portrayed and the role technology and media plays in this portrayal in Session 2.

Session 2 began with a recap of the introductory content and a discussion of the images collated previously. Thirty-one discrete images were identified, but only two had a tangible connection to the local area, while four were related to Ireland and eleven were abstract images; that is, images which were not documentary in nature, such as collages or figurative depictions of a burning earth. The facilitators discussed the ways in which opaque socio-technical forces such as algorithms can filter images seen when viewing searches online and how that may affect perceptions of climate change if the images were not recognisable or did not resonate with the everyday surroundings of the viewers. This led to debates about the challenge of psychological distance from climate change such distant imagery may create and the impacts that might have on motivations to participate in planning for climate change; something which also preoccupies psychologists (Spence, Poortinga, & Pidgeon, 2012). Following this, the second session focused on the social, economic and environmental history of the area in which the school was based. While the area is proximate to the centre of Dublin, it is separated from it both by a river and a canal which has led to an historically tight-knit community with a strong sense of place. Up until the 1980s, the main occupations of its inhabitants were dock workers and fishermen. Although generations of families remain in the area, in recent decades the community has become more fluid and diverse as young professionals working in the tech companies located in the nearby Docklands sought accommodation close to their workplaces. This historical tour provided a backdrop to identify and narrate three key flooding events which occurred in the area in the past 20 years and opened up discussions amongst the group about these. The place-based focus of this discussion proved productive. The first image of a flooded home shown was immediately recognised by a participant as their grandmother’s house, and subsequent discussions revealed that several participants’ parents and close relatives had directly experienced at least one of the flood events. The participants were encouraged to engage with their friends, families and neighbours about experiences of these events for discussion in the next session which would focus on flood management approaches.

Session 3 involved introductory content related to the types of flooding—fluvial, pluvial and coastal—experienced in the area as well as material regarding the mechanisms of flood control utilised, and the sensing and forecasting techniques employed. The students were then able to engage with these forecasts through a web-based, interactive mapping exercise which could be played simultaneously by all and which illustrated the potential impact of climate change on the participants’ homes in a concrete manner. The exercise used a number of interactive technologies: a web-based vector map—which provided a base map of the area in which participants lived—an in-browser spatial analysis toolkit that enabled the determination of a flood event’s impact on the participant’s home, and synchronised application state which enabled a shared, real-time display of participant locations. The base map was combined with a layer containing flood data for a variety of likelihood scenarios (0.001% AEP, 0.005% AEP, and 10% AEP—annual exceedance probability: the probability of a flood occurring in any given year). Finally, another vector layer to hold volunteered geographic information was provided. Figure 1 illustrates this: The bottom layer (horizontal pattern) contains the “base map” of geographic data; the middle layer (dot pattern) contains the flood data for a variety of scenarios; the top layer (vertical pattern) contains volunteered geographic information.



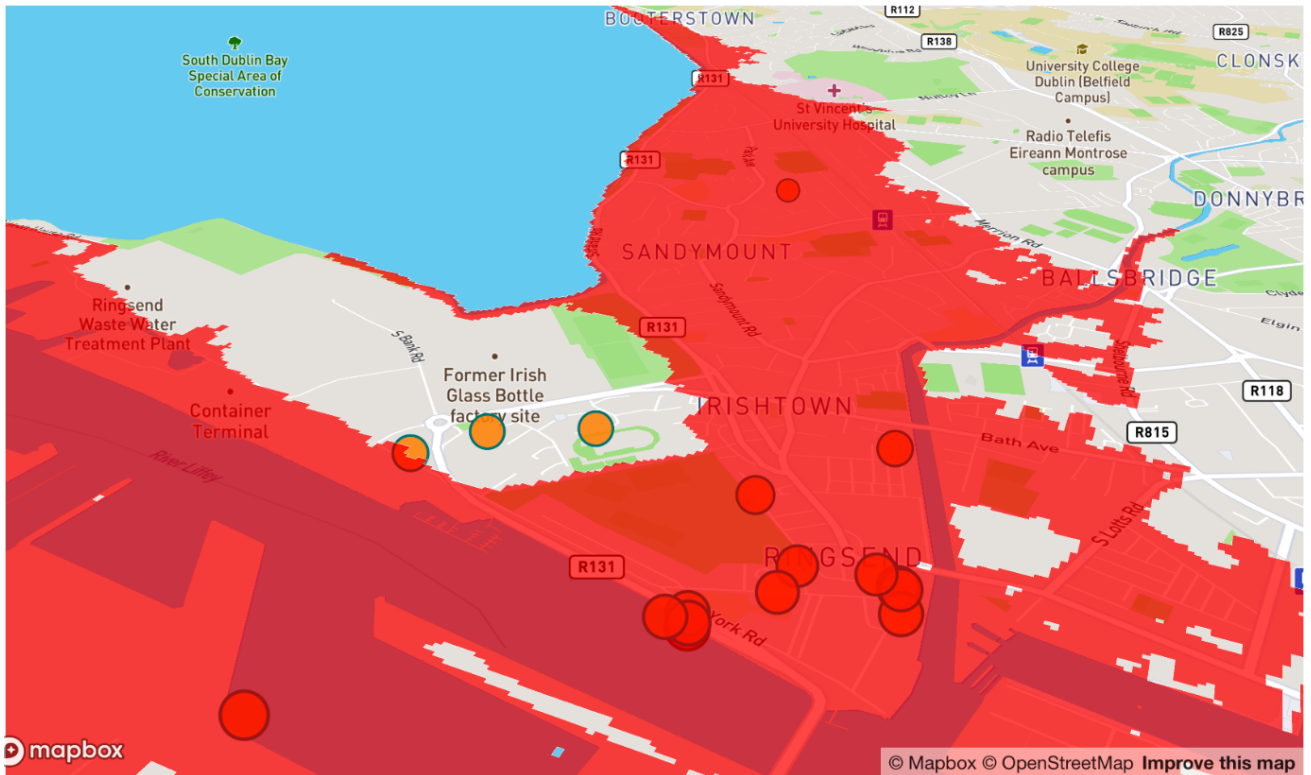
**Figure 1.** Conceptual model of the interactive exercise display elements.

Initially, each participant was shown a map in their web browser, displaying the area in which they lived, and centred on the workshop location (a secondary school). Participants were instructed to locate their home on the map, and to move their icon over that location. While doing so, they were able to observe the other participants’ icons moving. The second phase involved the activation of additional game controls by the facilitator: Participants were given access to three buttons, each activating the visualisation of a coastal flood extent for a given probability, enabling them to switch a flood event on and off, and immediately see whose home would be affected by a flood event (see Figure 2). The third phase involved an informal discussion of the exercise’s mechanics, and a discussion of the ‘results’: whose home had flooded, and who was thus affected. It was clear that in this context, as Joliveau (2009) also suggests, anchoring activities in participants lived environments usefully increased participant interest.

Discussion and analysis revealed that most (N = 18) participants’ homes would be flooded to some extent under all three scenarios. Participants initially saw this as catastrophic, with one participant gleefully announcing “I’m dead” after running the exercise. Such responses are something researchers have linked to the impact of popular culture ‘catastrophe’ films affecting perceptions of climate change risk (Bulfin, 2017). However, in the workshop such responses could be discussed in a more nuanced fashion, with the reiteration and reinforcement of material from previous sessions. Historical flooding in the area had been extensively discussed, and the extent to which participants’ relatives had been affected by that flooding was already established (i.e., they were financially affected and cannot access flood insurance, but they did not die), and the likely impact of future flood events was also illustrated.

Session 4 began with a recap on the forecasting of future flooding in the region before exploring the range of flood adaptation options which could be applicable to the predicted increase in flood frequency and intensity in the area (Dublin City Council & Codema, 2020). A range of hard and soft urban flood management options were presented, from emergent small-scale nature-based solutions such as porous pavements and vegetated roofs to large-scale hard engineering options including flood walls and off-shore flood barriers. The participants were encouraged to explore the pros and cons of the different options and possibilities for integration of blue-green and grey infrastructure (Kapetas & Fenner, 2020; Vojinović, European Commission, & Directorate-General for Research and Innovation, 2020). As raised in existing research on place attachment (Scannell & Gifford, 2013), the notion of managed retreat or wholesale abandonment of the area to rising seas was perceived as particularly distressing in discussions. While many workshop participants had previously voiced a desire to leave the area at some point, the idea that it could cease to exist or that they might not have a choice in the matter was a cause of considerable unease. It should be noted that this is not a realistic prospect within the next century under current projections, a fact that was made clear to participants to avoid generating unwarranted anxiety. Examples of local controversies around flood defences—where residents and policy makers disagreed about the relative worth of flood risk reduction versus aesthetic views of the coast—were successfully used in the workshop to discuss the complex choices facing policy makers in a democratic political system.

Session 5 comprised a visit to an interactive, game-based climate change visitor attraction about an hour’s drive south of the school. This commercial, for-profit interactive experience is designed for visitors of all ages, although its gaming focus appeals particularly to young people. While the experience is primarily mitigation-focused in content, the purpose of the visit was to further explore the benefit of adopting interactive gaming elements with the cohort that were so productive



**Figure 2.** Visualisation of a 0.001% AEP flood event on the community. Note: Markers approximately denote participant homes.

during the workshop. While the standard of presentation and quality of the games was extremely high, discussion with the participants revealed two drawbacks: The foci were on imaginary or quasi-imaginary places and on excitement—exercises had to be completed within set periods, generally using repetitive physical input rather than any critical thinking. While this created immediate immersion, it provided little opportunity for learning or reflection about the complexities of climate action.

The final session incorporated a repeat of the initial attitude survey and a chance for participants to present to the class their experiences of the workshops. The results of the survey (see Tables 2 and 3) show that the differences between responses are statistically significant ( $p < 0.05$ ) in two cases: (Q.4) I understand the difference between climate change mitigation and climate change adaptation; and (Q.7) I think interactive maps are a useful tool for talking about and demonstrating the effects of climate change;

However, other changes between the pre- and post-workshop surveys responses are also notable. For example, there was a decrease in agreement with the statement that it is too late to do anything about climate change, indicating that the sessions had provided participants with a greater sense of agency. There was also considerable increase in agreement with the statement that the participants knew about the history of flooding in their area and what their council was doing to help them manage climate change. Meanwhile, although

there was increasing agreement with the view that technology can help communities adapt to climate change, and that interactive maps were a useful means of demonstrating climate change effects, there was less agreement that computer games were a good way to imagine these effects. This finding may have been stimulated by the preceding fieldtrip experience which involved some games which were quite simplistic compared to the exercises in the classroom, but further research is required to explore whether gaming can play a role in expanding personal efficacy amongst young people in relation to participating in climate change adaptation, or not.

Overall, discursive feedback from the students also indicated that, from a low base, their knowledge about climate change, adaptation and flooding had increased over the duration of the project. Nonetheless, experiences and engagement with the workshop material were mixed within the group and there was inconsistent attendance across the six sessions related to low general attendance rates within the school. In addition, despite participants indicating increased understanding in the survey responses, many remained uneasy about formally presenting their knowledge to the group (including the facilitators and teachers) and they preferred informal class discussions to solicit feedback. Low levels of confidence in terms of expressing their views in front of others persist and would require longer-term engagement and activities specifically focused on supporting confidence in public speaking.



**Table 2.** Attitudinal survey results (pre- and post-workshop).

Statement	Survey	N	Mean Rank	Sum of Ranks	
1.	I think it's too late to do anything about climate change	Pre	25	24.74	618.50
		Post	22	23.16	509.50
		Total	47		
2.	I know about the history of flooding in my community	Pre	25	22.54	563.50
		Post	22	25.66	564.50
		Total	47		
3.	I know what the council is doing to help my community to cope with climate change	Pre	25	22.00	550.00
		Post	22	26.27	578.00
		Total	47		
4.	I understand the difference between climate change mitigation and climate change adaptation	Pre	25	20.14	503.50
		Post	22	28.39	624.50
		Total	47		
5.	I think technology can help me and my community adapt to climate change	Pre	25	21.26	531.50
		Post	22	27.11	596.50
		Total	47		
6.	I think technology is the most important tool we have to help us to adapt to climate change	Pre	25	24.62	615.50
		Post	22	23.30	512.50
		Total	47		
7.	I think interactive maps are a useful tool for talking about and demonstrating the effects of climate change	Pre	25	20.36	509.00
		Post	22	28.14	619.00
		Total	47		
8.	Computer games are a good way to help us to imagine the effects of climate change	Pre	25	26.60	665.00
		Post	22	21.05	463.00
		Total	47		
9.	Imagining what our lives will be like in the future is a good way to discuss adaptation to climate change	Pre	25	24.78	619.50
		Post	22	23.11	508.50
		Total	47		
10.	I think that changing my own behaviour can help to limit the effects of climate change	Pre	25	23.76	594.00
		Post	22	24.27	534.00
		Total	47		

**Table 3.** Survey test results with asterisks indicating statistical significance.

Survey Question number	Mann-Whitney-U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)
1	256.500	509.500	-0.425	0.671
2	238.500	563.500	-0.801	0.423
3	225.000	550.000	-1.112	0.266
4*	178.500	503.500	-2.168	0.030
5	206.500	531.500	-1.542	0.123
6	259.500	512.500	-0.356	0.722
7*	184.000	509.000	-2.034	0.042
8	210.000	463.000	-1.460	0.144
9	255.500	508.500	-0.444	0.657
10	269.000	594.000	-0.133	0.895

## 5. Conclusion

It is widely accepted that the effects of climate change are not the same for everyone and existing inequalities affect how climate change impacts populations and their ability to respond to it (Osborne, 2015). Measures intro-

duced to act on climate change will also have different effects on people, according to their gender, class, wealth, ethnicity, physical ability and other structural inequalities (Allwood, 2020). These differences need to be considered for climate action to be fair, both procedurally and in terms of the distribution of impacts.

However, this article demonstrates that despite the Irish Government articulating the need for a just transition to a decarbonised future in Ireland (Department of Environment, Climate and Communications, 2019a), there have been few spaces or resources developed to explicitly support disadvantaged young people in Ireland to engage with climate change, and fewer still to address engagement with climate change adaptation. In response, and as a preliminary experiment in developing relevant resources for disadvantaged young people, the series of place-based, technology-mediated workshops outlined in this article reveal positive impacts on participants' knowledge and sense of efficacy, albeit from a low base level.

Given the exploratory nature of the workshops, the small sample size and the statistically significant change in responses to only two questions, it is not possible to make strong claims about the positive impacts of the workshops in isolation. However, seen as a precursor to wider studies they indicate a promising line of enquiry. Participants' interest in and enthusiasm for place-based content, for example, adds evidence to Scannell and Gifford's (2013, p. 3) proposition "that messages would be more effective if they captured the local materialization of climate change, including the regionally relevant activities that contribute to the problem." Also, in line with Leiserowitz (2007), the workshops revealed that: Online media algorithms may create or reinforce unhelpful psychological distance from climate impacts; messages illustrating the local impacts of climate change can be captivating; and messages may be usefully targeted at a specific group to address the particular barriers they face in taking climate action. That the workshops identified "the complexities of inequality in urban phenomena" (Osborne, 2015, p. 136; see also Lee, 2007) such as deprivation, gentrification and flooding, and linked them to climate change allowed participants to identify their cumulative riskscape (Davies et al., 2020). It is important to encourage young people to connect climate change to their lived environments in this way and to think through the implications of adaptation in order to better understand: (1) why action in this arena is so difficult (e.g., uncertainties, long time horizons, large capital investments); (2) why it takes so long (e.g., multiple vested interests and diverse communities); and (3) how they can engage with those processes (e.g., through youth councils, open consultations, strikes and marches), all key questions raised by young people on climate strike marches in Dublin (Davies & Hügel, 2019).

To conclude, young people need to be supported to understand the complex politics and policy processes of climate adaptation alongside increased awareness of climate change science. While further research and a larger sample of participants is required, this exploratory study does provide evidence of the suitability of adaptation planning as an arena that young people in the classroom can actively engage with. Following on from Börner et al. (2020), we suggest it is important to ensure

that such educational interventions for engaging with climate change adaptation focus, at least initially, on what matters to the participants. This requires a collaborative process comprising dialogical and reciprocal interaction. Of course, enhancing climate change education does not necessarily lead to greater public participation and therefore a more procedurally just climate policy, as with other areas of environmental policy there are many intermediating variables between knowledge and action (Davies, Fahy, & Taylor, 2005). However, we suggest that movement towards procedural justice cannot be achieved in the absence of appropriate education on climate change science and politics, which includes attention to participation, engagement and adaptation. As one UN youth delegate for Ireland noted: "Together, we can build a world that leaves no one behind, but we must not build it *for* everyone. We must build it with everyone" (National Youth Council, 2017).

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### Conflict of Interests

The authors declare no conflict of interests.

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### About the Authors



**Anna R. Davies** is Professor and Chair of Geography, Environment and Society at Trinity College Dublin. She is Director of the Environmental Governance Research Group and a member of the Future Cities Research Centre at Trinity. A member of the Royal Irish Academy, Anna has advised governments on matters of environmental governance and sustainability. She has acted as an independent member of the National Economic and Social Council and the inaugural Climate Change Advisory Council in Ireland.



**Stephan Hügel** is a Marie Skłodowska-Curie Research Fellow at Trinity College Dublin. His research interests include smart cities, urban informatics, citizen engagement, and climate change.