

Final Report

Enabling Societal Transformation in the Face of Climate Change (SOLSTICE)

1. Identification of the project

Project full title: Challenging the Climate Crisis: Children's Agency to Tackle Policy Underpinned by Learning for Transformation

Project acronym: CCC-CATAPULT

Starting date: 1st December 2021

End date: 30th November 2023 (extended to 31st May 2024 due to staffing changes)

Project duration (months): 36 months – extended to 42 months.

Reporting period of this report: 3.5 years

Project website: <https://ccc-catapult.org/>

Lead Project Investigator (name, title and affiliation): Professor Lindsey McEwen, University of the West of England, Bristol, UK

Project partners: University of the West of England, Bristol, UK; Tampere University, Finland; University of Genoa, Italy; University of Galway, Ireland

2. Objectives of the Project (max. 1 page)

Using a youth-informed methodology, the CCC-CATAPULT project aimed to critically examine educational, worldview and intercultural influences on young people's climate and environment-focused learning and agency at a time when 'eco-anxiety' is starting to become a defining characteristic of the climate emergency. Within our interdisciplinary consortium, with case studies in England (Bristol), Ireland (Galway), Finland (Tampere) and Italy (Genoa), we have addressed the following objectives:

- (1) to explore sense making and existing and potentially new social norms, worldviews, possible tensions and eco-anxieties;
- (2) to co-create a vision for transformed climate-focused education in each context;
- (3) to deep map insights and actions to enable transformation;
- (4) to co-develop a methodology and toolkit to better link education and worldview knowledge with policymaking;
- (5) to co-deliver and evaluate a set of research-informed activities inside and outside of educational settings; and
- (6) to co-develop policy and practice-focused recommendations.

How objectives are linked to research design and methods

Objectives 1 & 2: Systematic reviews covering the research and policy literature and the surveys and psychological scales used to date in investigating young people's ecological, environmental, climate change, climate impact and intercultural understandings, beliefs, norms, values, attitudes and actions.

Objectives 1 & 5: Co-production and peer administration with young people aged 15 to 18 of a questionnaire-based survey, using outputs from the systematic reviews to benchmark sense-making in relation to the above concepts.

Objectives 2, 3, 4 & 5: Visioning, deep-mapping and stimulus co-production to explore climate, worldview and intercultural educational narratives and to co-produce activities and resources to influence policy making.

Objectives 5 & 6: Synthesis of WP2 outputs in relation to Objectives 1-5 to co-produce policy and practice recommendations through which to communicate and disseminate the main findings to generate impact for a range of beneficiaries (refer to Impact sections).

Changes to objectives: While the core objectives are still in line with the original programme of work, the CCC-CATAPULT process initially expressed an aspiration to be 'youth-led'. This was adjusted to be 'youth-informed', recognising the dynamic of a co-production research process with young people where different inputs come together. Interdisciplinary reflections on our co-working practices with young people have informed a peer reviewed journal article (Portus et al., 2024; see section 3).

3. Scientific activities and results (max. 1 page)

CCC-CATAPULT has worked with an ethos of co-production with young people within a multi-method process. All partners are involved in all stages of this process but with different leads.

Literature review: As part of the research process, a semi-systematic review of the literature on the Value-Action gap in Environmental Education was undertaken and published (Portus et al., 2024¹).

Youth Action Partnerships: During the three years, we established active Youth Action Partnership (YAP) groups active for all or part of the project duration in all four city-regions and across locations in an international YAP group. Some young people (YP) have been actively involved longitudinally in research and capacity building throughout the project since July 2021. Challenges involved securing diversity in membership of YAPs and continued participation within the later resource creation and dissemination stages. Co-production processes have been evaluated and insights from both YP and researchers are reported in a journal article (Portus et al., 2024²) that has proposed additional principles for coproduction with young people.

Survey of YP and the value-action gap: This was completed, and data analysed, with different national teams taking responsibility for distinct stages. In total, 1,879 young people completed the survey across the four city regions. Basic statistical analysis has been completed as an internal report (led by UWE Bristol), with an externally facing 10-page Executive Summary shared with different stakeholder fora and online. Headline findings included differences between respondents from Tampere city-region and the other three settings. Advanced statistical analysis was not in the original work programme, but two subgroups of the research team took the opportunity for exploring the statistical datasets with external statistical specialists. This permitted investigation of the relationship between growth mindsets and climate action (Rissanen et al., 2024³) and a profiling of the value-action gap (paper in preparation).

Focus groups with YP: The focus groups explored in further depth themes identified from survey responses: trust and intergenerational influence; understanding the value action gap and transformative futures addressing the value action gap. The team conducted 21 focus groups (FG) in total with young people (15-18 years old; five FG in Finland, Italy and Ireland, and six in the UK). Cross-country analysis was undertaken (led by Galway), leading to an externally facing three-page Executive Summary and an internal report that is being mined for different public outputs. Young people participating in focus groups felt confident in their knowledge about climate change but did not feel such confidence when talking with others (especially older generations) on the topic. The relationship between these groups was complicated, with young people indicating that they felt they did not have a voice in decision making on the theme of climate and climate crisis. They felt as though they were being looked

¹ Portus, R., Aarnio-Linnanvuori, E., Dillon, B., Fahy, F., Gobinath, D., Mansikka-aho, A., Williams, S.-J., Reilly, K., & McEwen, L. (2024). Exploring environmental value action gap and education research: a semi-systematic literature review. *Environmental Education Research* 30(6). <https://doi.org/10.1080/13504622.2024.2314060>

² Portus, R., Williams, S.-J., Mansikka-aho, A., Reilly, K., Aarnio-Linnanvuori, E., De Vito, L., Dillon, B., Fahy, F., Gnecco, I., Sposito, S., Palla, A., & McEwen, L. (2024). Reflections on co-productive research in a youth-focused climate education project. *Geographical Research*. <https://doi.org/10.1111/1745-5871.12642>

³ Rissanen, I., Kuusisto, E., Aarnio-Linnanvuori, E., Portus, R., Williams, S. J., Laggan, S., Reilly, K., & Vainikainen, M. P. (2024). Exploring the association between growth mindsets and climate action with young people. *Social Psychology of Education*, 1–21. <https://doi.org/10.1007/s11218-024-09937-9>

as the group who should solve the climate emergency, despite a lack of opportunity to be involved in climate initiatives. Further to this, when asked about their experiences of climate change education (CCE), young people felt a heavy burden to solve the issues presented, although they were not provided with the resources to support such activity. Young people wanted a CCE experience fit for purpose, linked with local examples and places, where teachers and supporters of learning were trained and provided with sufficient resources to support young learners in this field.

Interviews with teachers and supporters of learning: The interview schedule had five themes with different questions for teachers and other supporters of learning in some themes. The themes were, 1) Climate change and integration, 2) Climate change and teachers/educators, 3) Climate change knowledge and confidence, 4) Climate change and young people's experiences, 5) Climate change and the future. We conducted 36 interviews with 37 teachers and other supporters of learning (eight interviews in Italy, eleven in the UK, nine in Finland and Ireland). A cross-country analysis has been produced with Galway leading (included Executive Summary; see CCC-CATAPULT website). Interviewees agreed that educators play an important role in teaching young people about climate crisis, however, they identify significant challenges to delivering effective climate change education (CCE). This includes the need for changes to the current delivery of CCE; this would address a perceived lack of training for educators and resources. They also provide guidance as to where CCE might sit within national curricula. The concerns of interviewed educators were also mirrored by young people during focus groups conversations. A journal article on the formal educators and their perceptions of climate literacy and climate change education has been submitted for peer review in August 2024.

Narrative work with YP: The UWE team developed a two-phase narrative process which combined elements of deep mapping, storyboarding and visioning to explore YP's important places and where they might learn for transformation in the climate crisis. Twenty narrative workshops with YP in school settings were delivered, with co-interpretation of results with our YAP groups. Phase 1 of the process explored YP's Place Connectedness and Values Emerging. Themes included indoor/outdoor; connection to nature; family ties; religion; and emotions connected to places. Phase 2 activity investigated what places for learning in CCE could look like. These data have been analysed as to the nature of these (i) *Learning places* (e.g. formal/informal; indoor/outdoor places; particular places of interest e.g. caves, bunkers; links to people, teachers and family in particular); (ii) *Values, Affect and Agency Connected to Learning Places* (e.g. nature connectedness; sustainable food or energy production; frustration at wastefulness; caring; creativity); (iii) *Ways of Learning and Being within Spaces* (e.g. collaboration; students as leaders; fun; media and technology as part of learning); and (iv) *Adapting and Transforming Learning places* (e.g. embedded sustainability practices in adapted or transformed versions of schools).

Policy workshops and policy brief development: Interactive Outcome Mapping Workshops were delivered in each of the four city-regions to co-design the policy workshops. Meeting outcomes fed into a guideline document for each city region to follow when setting up/delivering their workshop. Four policy workshops involving key decision makers in local, regional and national educational policy took place, in some cases involving YP (Genoa city-region). These provided a platform for stakeholders to critically discuss findings and identify opportunities for more engagement and actions to address YP's concerns and expectations. The policy workshops contributed to informing the development of five policy briefs (one for each city region and one overarching). These documents will be available on the CCC-CATAPULT website (two already posted).

4. Communication and dissemination activities (*max. 1 page*)

WP4 has overarched all Objectives to ensure Pathways to Scientific/Social Impact and Dissemination have been undertaken by the research team throughout CCC-CATAPULT to maximise beneficiary involvement and thus the benefit generated by the project. We have worked from a bottom-up perspective, with youth-informed pathways as priority. All partners contributed to the development of an in-depth communications strategy that was shared with, and informed by, local and international experts from our advisory groups. A range of materials have been synthesised by the project team into accessible formats for dissemination to community, policy and professional audiences. Examples of the most important communication and dissemination activities follow:

Communication with Young People: Youth Action Partnership (YAP) groups have been actively working in Bristol, Galway, Tampere and Genova city-regions through a total of 40 local and 4 international meetings to guide the research and develop a co-productive approach. The YAPs have taken a lead role in some of the communication activities including providing communication skills training (role playing, designing engaging events and digital skills), writing articles with researchers, presenting their key reflections on the research findings during the policy workshop, presenting at conferences with researchers, and organising school presentations, community-based climate cafes, and academic panels.

The results of CCC-CATAPULT research have been shared with young people beyond the immediate project – for example, in content in undergraduate degrees, specially organised sessions with young people at national conferences and other school engagements. Some of the tools to support young people's learning that have been developed as a result have been utilised in a university-wide climate education project. The findings from CCC-CATAPULT that highlight the need to attend to young people's emotional engagement have directly influenced the establishment of a new informal learning provision at UWE, Bristol (Climate, Conversations and Cake).

Communication with policy makers and professional audiences (regional): Extensive local outreach at the project's start was aimed at raising awareness of the project, recruiting members for the advisory group and for YAP recruitment. 10-50 agencies and relevant organisations per country were contacted and numerous meetings with individual groups interested in youth work, environmental work and education held. Local stakeholder advisory groups have continued to guide and advise researchers through biannual meetings. To date, CCC-CATAPULT findings have been presented to professional audiences and general public in 49 events, participated by over 5000 people. Four policy workshops have been facilitated where policy makers and influencers as well as YP were in attendance. Four co-developed locally tailored policy briefs were developed as a result (see section 4).

Communication with academic researchers: The project's International Advisory Group with academic and policy representatives drawn across case-study settings has had one full day and two half day meetings. To date, 49 CCC-CATAPULT presentations have been given in academic conferences. Five peer reviewed articles have been published, one article is in peer review, and seven article manuscripts are in preparation. Eight of these are core papers utilising cross-country data. Data gathered in the interviews is being archived for wider access, as indicated in the Data Management Plan.

Communication channels and CCC-CATAPULT toolkit: CCC-CATAPULT's social media accounts have successfully built followers resulting in extending networks and influence (Instagram 197 followers, 83 posts; Twitter 359 followers). A youth-informed social media strategy was developed leading to creation of content to support these accounts. A project website (ccc-catapult.org) features project updates/blogs – some written by young student interns. In addition, cross-links with external youth media channels have been activated (as an example, in Genoa “Deledda for future”). Since the website creation, we have had 15,280 visitors who have collectively made 33,645 visits (all numbers accurate to December 4th, 2023). The website has been developed into a legacy site, which contains the CCC-CATAPULT toolkit and other project resources. The eight tools have been co-developed and evaluated with young people, educators and policy makers and include resources and methodological guides for 1) climate change focused education and teacher education 2) co-productive research with young people and 3) including youth in climate policy making.

5. Comparison of the project progress with the original work plan (max. 1 page)

WP	Tasks	Milestones	Deliverables
WP1: Conceptual framework	T1.1, 1.2, 1.3 and 1.4 delivered	M1.1 delivered	D1.1, 1.2, 1.3 and 1.4 completed; D1.5 - decision taken to remain with original conceptual framework.
WP2 Empirical research	T2.1, 2.2, 2.3, 2.4, 2.5, 2.6 and 2.7 delivered	M2.1, M2.2 and M2.3 completed.	D2.1, 2.2, 2.3, 2.4, 2.5, 2.6 and 2.7 completed.
WP3: Policy Integration, Tools & Techniques	T.13, T3.2, T3.3 and T3.4 delivered	M3.1 complete	D3.1, 3.2, 3.3, 3.4, 3.5 and 3.6 completed.
WP4: Communication, dissemination & impact	T4.1, 4.2, 4.3, 4.4 delivered Task 4.4 and 4.5 delivered and continued post project funding	M4.1 complete.	D4.1, 4.2, 4.3, 4.4, 4.5 and 4.6 completed. 4.7 not delivered as not appropriate conference. Participation in ECCA 2023 instead.
WP5 Project management	T5.1, 5.2, 5.3, 5.4 and 5.5 completed.	M5.1, 5.2, 5.3, 5.4, 5.5 5.6, 5.7, 5.8, 5.9 and 5.10 delivered	D5.1, 5.2, 5.3, 5.4, 5.5 and 5.6 delivered.

Changes to partner teams: The teams in three settings have grown larger through maternity leave, secondments, the bringing in additional statistical expertise etc. These changes have brought benefits of new knowledge and skills to the research team.

Project goals: The project is on course to deliver on or exceed its original goals.

Difficulties and solutions:

1. The research team from Genoa received late project approval which delayed appointment of its research fellow. However, early in 2022, they made an excellent appointment thus allowing to support and caught up with the experimental activities as well as the data analysis. All the activities have been carried on since the beginning, elements of the research process (mainly coproduction with YP) were mainly developed later in the project.
2. There was a delay to the delivery and subsequent analysis of the deep mapping narrative work. This was for several reasons, including late appointment and secondment of staff involved in the project, and the different timing of the school years in the involved countries. The team originally accommodated this within its original time plan. However, two staffing changes within the UWE Bristol team necessitated a 6-month extension.
3. COVID-19 impacted CCC-CATAPULT in two main ways: It necessitated online consultations and awareness raising with stakeholders at the start, along with uncertainties in research planning and issues of not being able to engage young people directly in schools - to promote their participation in CCC-CATAPULT. High levels of absenteeism in schools due to covid - in addition to screen fatigue - caused slow recruitment for YAPs initially.

4. The project team was unable to meet face-to-face due to the pandemic and institutional travel restrictions. Extended team meetings have been delivered virtually on Zoom, alongside regular 1-hour fortnightly team meetings and longer thematic meetings on specific aspects of methods, analysis or writing. Some team members have been able to capitalise on delivery of research at conferences to meet face to face.

6. Social Sciences and Humanities (*max. 0.5 page*)

Social science and humanities disciplines are at the centre of the interdisciplinary CCC-CATAPULT project. At its start, the team was a new international collaboration, with geography (U of Galway, UWE Bristol), planning, environmental psychology (UWE Bristol) and education (U of Tampere) collaborating with experts in green engineering for climate adaptation (U of Genoa). The sharing of SSH expertise with the Genoa team has been a key success within overarching team development. This connection at the social: technical interface has led to new insights about how to promote adaptive learning in the city through nature-based solutions.

The project's Communications Strategy and Pathway to Impact Strategy have been informed by the team's SSH expertise in developing participatory and co-productive research (here with young people and other stakeholders). This approach has supported knowledge exchange for social change through and beyond the research process. For example, the Stakeholder Groups in each setting have developed important communities of practice that is likely to extend beyond the project lifespan. This involvement of SSH within CCC-CATAPULT in contributing to social change through the project's research processes has exceeded that anticipated the project proposal in some areas (e.g. in ongoing KE through regional and national stakeholder engagement). This work will continue beyond the funded lifespan of the project.

6. Pathways to impact (max. 1 page)

CCC-CATAPULT's research has generated the following resources:

- **Empirical datasets** (quantitative and qualitative) on sense making, worldviews, climate literacy, environmental learning and education and cultural meaning for the 15-18 age group from four European city-regions.
- **Research Executive Summaries** exploring the value-action gap in relation to young people and the climate crisis through CCC-CATAPULT's three nested research approaches. These syntheses explore the key barriers and opportunities experienced by young people in relation to social transformation for climate change.
- **A tool kit of research-informed resources**, led by UWE Bristol, to support bridging the value-action gap in (i) climate change education; and (ii) climate change policy and practice. Target groups for these sets of resources are young people, teachers, other facilitators of learning and regional and national policy makers. The underpinning research fills gaps in previous research (e.g. on the role of storytelling in dialogic processes). The eight tools (see Appendices 3 and 4) share innovative practice, for example, for (i) co-producing research with young people; (ii) deep mapping/storyboarding methods for exploring place-based connections within climate education; (iii) running climate cafés; (iv) running policy workshops with young people; (iv) promoting teaching with world views/values.
- **Evidence-based policy recommendations within five policy briefs** (four national; one cross-setting) on engaging young people within the climate crisis. These aim to facilitate communication and action and empower young people to enhance their agency and policy influence.
- **A collection of peer reviewed journal articles** and two book chapters as part of CCC-CATAPULT's publication strategy. This writing is still in progress. A list of publications produced to date is provided in Appendix 1.
- **Two PhD students** - as a body of work associated with Galway (awarded) and Tampere, (in progress) with research training developed through the completion process (See Appendix 2).

The project through its communications strategy has set up and developed several impact pathways. These have been strengthened by stakeholder involvement in the research processes (co-production, participatory, advisory) and are being used in developing/maximising short and longer-term impact.

Impact pathways: short and medium-term (during the project and up to a year after):

- Youth Action Partnerships as voices within and for the project
- Activities to engage regional YP more widely (e.g. Climate Change summer school for 15–18-year-olds - Galway; Climate Café run by YAP- Bristol; open panel discussion arranged by YAP-Tampere).
- Submission for research and engagement prizes in three regional, national or international competitions. (1) ENLIGHT European University Alliance Impact Award:

(Climate Change Category) Winner: Dr Kathy Reilly representing the CATAPULT Project⁴ (2) EPA Researchers Awards 2023 Infographic Winner⁵

(3) The Bristol YAP nominated for the Bristol Young Heroes Award.

- Redevelopment of CCC-CATAPULT project website (led by UWE Bristol) as a legacy site with all resources from the project. These resources are being promoted with key users and organisations.
- Engagement with CCC-CATAPULT's International Project Advisory Board - has an ambassadorial/knowledge exchange role as part of group's remit.
- Four regional/national Stakeholder Groups – acting as conduits for sharing research process and results and facilitating dialogue about policy relevance.
- Local and national strategic and professional Pathways (e.g. article for Geographical Association journal 'Geography' to target teachers and teacher educators; Reilly et al., 2024⁶). Presentations in presentations in in-service teacher conferences/training events.

Impact pathways: longer-term (1 year onwards): These include:

- National plans/policies based on CCC-CATAPULT results and co-produced visions to support climate transformation ambitions in each country. This will include a tracking of the policy briefs to evaluate how they are being used.
- Co-creation of tools to support education and action programmes for 15–18-year-olds within and beyond the four countries to enhance links between research, engagement, teaching and supporting learning and sense making to increase global climate literacy and capacity. These resources are being promoted in partnership with gatekeepers in different educational settings. Their use and its impact are being tracked.
- The CCC-CATAPULT team is working to engage international organisations for impact. This includes input to the UN (United Nations) Climate Education Programme, Red Cross Climate Centre and other national and international activities through meetings and discussion focused on outputs and deliverables.

⁴ <https://www.universityofgalway.ie/about-us/news-and-events/news-archive/2024/july/two-university-of-galway-academics-recognised-by-enlight-european-university-alliance-.html>

⁵ <https://www.epa.ie/publications/research/communicating-research/epa-researchers-awards-2023-infographic-winner.php>

⁶ Reilly, K., Dillon, B., Fahy, F., Phelan, D., Aarnio-Linnanvuori, E., De Vito, L., Gnecco, I., Gopinath, D., Holmes, A., Laggan, S., Mansikka-aho, A., Palla, A., Portus, R., Rissanen, I., Sposito, S., Williams, S.-J., & McEwen, L. (2024). Learning from young people's experiences of climate change education. *GEOGRAPHY*, 109(1), 44-48. <https://doi.org/10.1080/00167487.2024.2297616>

7. Collaboration with non-academic stakeholders (max. 1 page)

Youth Action Partnerships (YAP): Development of YAP groups in each case-study setting has been a key element of the project's research process. 25 young people have been involved in the YAP process.

The aspiration was to work within the principles of co-production although the young people (YP) were not involved at the funding proposal development stage. There has been the challenge to deliver in terms of engaging young people in each setting, working to ensure diversity and sustaining the involvement of the group. However, elements of the process have worked as planned or better. As a team, we are currently reflecting on the process with the YAP we have worked with. Three settings have worked with active YAP groups (Tampere, Bristol and Genoa), even though Genoa group became active later in the project. Where required, settings (Genoa, Galway) adapted the model so there was input from YP's voices throughout. The teams have blended young people's research participation with capacity building and activities in the research process. Co-production with YP (15-18 years old) over an extended period brings specific challenges given that they are developing into adulthood, have other pressures like school examinations, and are moving onto new stages in their lives.

Young people beyond YAPs: Engagement activities like climate cafes and work with undergraduates in researcher institutions, brought a wider network of young people and their voices into the project in addition to those directly participating in it. In addition, prior to the formation of the stable YAP group in Genoa, the Italian team used an alternative model: involving variable small groups of young people to get feedback on specific research activities. A total of around 22 young people were involved at this early stage.

Schools, teachers and supporters of learning: CCC-CATAPULT has worked with schools in each city region and their teachers in the delivery of all stages in the research process. Presentations on the project occurred prior to the young people completing the survey. Feeding back to schools** on the research results represents an important closing of the loop. Thirty-seven teachers and facilitators of learning contributed their insights on CCE to our research interviews. In some cases, the same teachers were involved in the policy workshop thus participating as listeners/discussants to the sharing/dissemination phase of the project results. Teachers have provided evaluative feedback on the development of CCC-CATAPULT's tool kit.

Policymakers: CCC-CATAPULT's policy workshops have brought together young people and decision makers involved in educational policy, including teachers, local government, and youth organisations.

CATAPULT Stakeholder groups: These have run in different formats in the four different national settings and have distinct roles in each setting. Bristol's group comprised regional stakeholders, with an advisory role. Both Ireland and Finland teams ran national stakeholder groups that are involved in project monitoring and formal reporting to funders. All these meetings have involved on-going knowledge sharing and feedback with stakeholders for mutual learning. In addition, there have been engagements with civil society groups beyond formal organisations (e.g. Sustainable Schools Network or Green Schools in Ireland).

International Advisory Board: Although this group has been mainly comprised of academic participants, there are members from policy whose expertise has been drawn on in developing the impact pathways.

8. Availability of new results (max. 1 page)

Did any third-party results become available since the start of the project, which proved relevant for the implementation of the project?

There has been significant new research focused on the young people and the value-action gap (see examples below). We continue to track this and make connections, ensuring awareness of parallel projects/ initiatives by different players (e.g. the Climate Change Education Research Network; Red Cross Climate Centre). In addition to developing a comprehensive literature review during the early stages of the project, we have been continuing to update our literature review as the project continues (e.g. on climate education and place), with particular attention to published outputs.

In the last year, team members have been actively involved in national and international conferences to exchange results with others (including ECCA -European Climate Change Adaptation - 2023). The team have accessed cutting edge research in this space as well as organising sessions and placing the CCC-CATAPULT project and team in the centre of emerging research in this field.

There have been other quantitative surveys undertaken with young people but not with the specific focus or scale of our cross-national survey (e.g., Jones 2021 report).

In Bristol, researchers have been involved in other related research that has resulted in a youth [Climate action hub: Empowering youth engagement project report](#) and the production of a [Youth Climate Communications Toolkit](#).

Important recent papers/studies relevant for our own thinking/research implementation include:

Hickman, C., Marks, E., Pihkala, P., Clayton, S., Lewandowski, R. E., Mayall, E. E., Wray, B., Mellor, C., & van Sauterne, L. (2021). Climate anxiety in children and young people and their beliefs about government responses to climate change: a global survey. *Lancet Planet Health*, doi: 10.1016/S2542-5196(21)00278-3. PMID: 34895496.

Dunlop, L. and Rushton, E.A., 2022. Putting climate change at the heart of education: Is England's strategy a placebo for policy? *British Educational Research Journal*, 48(6), pp.1083-1101.

Verlie, B. and Flynn, A., 2022. School strike for climate: A reckoning for education. *Australian Journal of Environmental Education*, 38(1), pp.1-12., Vancouver.

Gunasiri, H., Wang, Y., Watkins, E.M., Capetola, T., Henderson-Wilson, C. and Patrick, R., 2022. Hope, coping and eco-anxiety: young people's mental health in a climate-impacted Australia. *International Journal of Environmental Research and Public Health*, 19(9), p.5528.

Ojala, M., 2022. How do children, adolescents, and young adults relate to climate change? Implications for developmental psychology. *European Journal of Developmental Psychology*, pp.1-15.

Rushton, E.A., Sharp, S., Kitson, A. and Walshe, N., 2023. Reflecting on Climate Change Education Priorities in Secondary Schools in England: Moving beyond Learning about Climate Change to the Emotions of Living with Climate Change. *Sustainability*, 15(8), p.6497.

9. Outlook (max. 1 page)

Future development of research focus

- In the Finnish climate change education network, the CCC-CATAPULT survey results have stimulated significant discussion, because they differ from some other survey results. This has led to an idea of undertaking a thorough comparison of methods and scales in different studies.

Key areas for further research include:

- The complex role of intergenerational relationships (family, community, governance) within CCE.
- More comparative (intra and cross-cultural perspectives). This project garnered data from four city-regions. It evidences the value of inter-cultural comparison but also raises questions about intra-cultural differences and the importance of place.
- How to maximise the Pathways to impact in co-working with YP in different cultural settings.
- Methods of meaningful co-production with more marginalised groups of young people. CCC-CATAPULT found that engaging young people longitudinally as co-researchers took time and effort; engaging more diverse young people was challenging given their other pressing concerns/imperatives.

Links with other projects and programmes

Through a series of organised sessions, the CCC-CATAPULT project connected with a wide range of other projects and programmes of events. Highlights include connections with the iAdapt European project; Ireland's Children and Young People's Assembly on Biodiversity Loss; The SAUTI Youth Project (Ireland and Tanzania); the youth wing of CAIM (Communities Against the Injustice of Mining), the International Red Cross Climate Centre, UK Government's 'Climate in Education' initiative, International Teachers' Climate Change Forum, and Foundation for Environmental Education Finland. In addition to this, the results of the CCC-CATAPULT project have already informed the work of several participating organisations (for example, Global Action Plan Ireland) and organisations represented on the national steering groups of each partner country (for example, Irish Sustainable School's Network and Finnish National Agency for Education).

The Genoa research team is now leading the project 'Urban Resilience to Climate change: to Activate participatory mapping and decision support tool for enhancing the sustainable urban drainage -URCA!' that has been funded within the Italian national research program PRIN. Among the research activities, this project includes participatory activities that benefitted from the experience gained with schools during the experimental activities carried on in the CCC-CATAPULT project (<https://prinurca.wordpress.com/partners/>). In addition, a new connection has been activated during the Genoa policy workshop - with the Municipality of Genoa now involved as a partner in the NBS EduWORLD project (<https://nbseduworld.eu/project>) funded by the European Union (Grant Agreement No. 101060525).

The CCC-CATAPULT findings related to the challenges of current climate change education and teachers' expertise have also informed the objectives and design of the project "Developing Teachers' Mindsets for Transformation: Fostering Cultural Change Towards

Sustainability", funded by the Research Council of Finland. This project will explore teachers' transformative mindsets and develop an intervention to influence them.

Sustainability of the networks

CCC-CATAPULT will continue to maintain and develop its community of interest. It will keep its social media active within and beyond the timeline for the project. The team is reviewing how best to maintain a mail base of its community of contacts for sharing project outputs and developments for impact. Each city-region has built a regional/national stakeholder group that it will work with maximising the impact of the results.

Suggestions for JPI Climate

- Negotiate additional impact funding – to help increase the impact of research in JPI SOLSTICE beyond the three-year project timeline.
- Consider some sort of follow-on funding as a way of capitalising on new interdisciplinary and transdisciplinary teams built during this funding round. Effective interdisciplinary and transdisciplinary working takes time to develop.

10. General comments

Please add any additional comments you may have. This can also include any positives or challenges that your project faced during its lifetime, so that we can improve in future activities.

The reporting schedule for the project could be usefully outlined at the start of the project timeline. The interim and final reports and the specification of presentations/ roundtables came with short lead time, which required juggling with other work pressures. This has also impacted on the CCC-CATAPULT's team's ability to engage face to face at JPI SOLSTICE meetings.

APPENDIX I: CCC-CATAPULT Research papers

Under review

Aarnio-Linnanvuori, E., Reilly, K., Rissanen, I., Portus, R., Sposito, S., Dillon, B., Mansikka-aho, A., Gopinath, D., De Vito, L., Fahy, F., Gnecco, I., Hennessy, L., Holmes, A., Laggan, S., Palla, A., Phelan, D., Williams, S.J., and McEwen, L. (in review) Teaching for climate literacy: European educators' perceptions and experiences of negotiating with curriculum.

2024

Portus, R., Aarnio-Linnanvuori, E., Dillon, B., Fahy, F., Gopinath, D., Mansikka-aho, A., Williams, S.-J., Reilly, K., & McEwen, L. (2024). Exploring environmental value action gap and education research: a semi-systematic literature review. *ENVIRONMENTAL EDUCATION RESEARCH* 30(6). <https://doi.org/10.1080/13504622.2024.2314060>

Portus, R., Williams, S.-J., Mansikka-aho, A., Reilly, K., Aarnio-Linnanvuori, E., De Vito, L., Dillon, B., Fahy, F., Gnecco, I., Sposito, S., Palla, A., & McEwen, L. (2024). Reflections on co-productive research in a youth-focused climate education project. *GEOGRAPHICAL RESEARCH*. <https://doi.org/10.1111/1745-5871.12642>

Reilly, K., Dillon, B., Fahy, F., Phelan, D., Aarnio-Linnanvuori, E., De Vito, L., Gnecco, I., Gopinath, D., Holmes, A., Laggan, S., Mansikka-aho, A., Palla, A., Portus, R., Rissanen, I., Sposito, S., Williams, S.-J., & McEwen, L. (2024). Learning from young people's experiences of climate change education. *GEOGRAPHY*, 109(1), 44-48. <https://doi.org/10.1080/00167487.2024.2297616>

Rissanen, I., Kuusisto, E., Aarnio-Linnanvuori, E., Portus, R., Williams, S. J., Laggan, S., Reilly, K., & Vainikainen, M. P. (2024). Exploring the association between growth mindsets and climate action with young people. *Social Psychology of Education*, 1–21. <https://doi.org/10.1007/s11218-024-09937-9>

2023

Rissanen, I., Aarnio-Linnanvuori, E., & Mansikka-aho, A. (2023). Worldview Transformation in and through Education: Mapping the Nexus of Climate Education and Worldview Education. In L. Gearon, A. Kuusisto, S. Poulter, A. Toom, & M. Ubani (Eds.), *Religion and Worldviews in Education: The New Watershed* (pp. 194-206). (Routledge Research in Religion and Education). Routledge. <https://doi.org/10.4324/9781003265696-17>

APPENDIX 2: PhDs associated with CCC-CATAPULT

PhD Candidate: Bronagh Dillon

Thesis Title: Young People's Understanding of Climate Change: Moving Towards Transformative Climate Change Education

Supervisors: Kathy Reilly and Frances Fahy (University of Galway)

Status: Awarded.

PhD Candidate: Anette Mansikka-aho

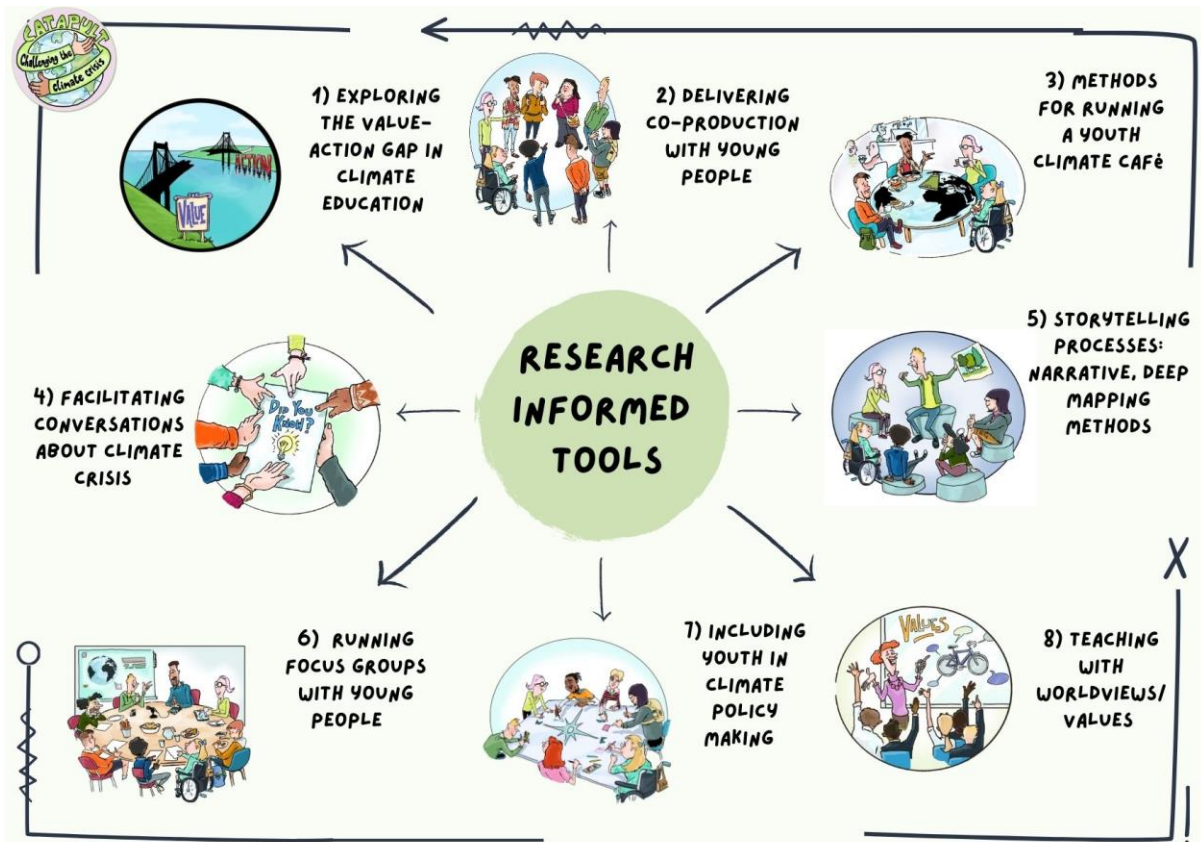
Thesis Title: Reversing Pedagogical Relationships: Putting young people's voices at the heart of environmental education.

Supervisors: Antti Saari, Inkeri Rissanen and Panu Pihkala (Tampere University).

Status: Likely submission date - end of year 2026.

(Anette was employed as a doctoral researcher to the project and also was able to use some of her time to work on her PhD).

APPENDIX 3: Summary visuals - The CCC-CATAPULT tool kit



APPENDIX 4: CCC-CATAPULT: Summary description of eight educational tools

Number	Name	Description
1	Exploring the Value-Action gap in Climate Education	The Value-Action Gap, a term used to describe the mismatch between people's pro-environmental behaviours and their actions or behaviours, is a core area for exploration in the CCC-CATAPULT project. This set of slides can be used to introduce you and audiences such as teachers, young people, policy makers and researchers to the Value-Action Gap concept.
2	Delivering co-production with young people	A central ethos to the CCC-CATAPULT project was to work co-productively with young people in the delivery of the research. This tool presents new principles for working on research projects in collaboration with young people. It also shares the research teams' reflections, as well as activities that research teams can use in planning effective co-production with young people.
3	Methods for running a youth climate café	The research team in the CCC-CATAPULT project worked with a group of young people as co-researchers to deliver a youth-focused Climate Café in Bristol, aimed at widening participation and engagement. This guide was co-produced with some of the group's members as well as UWE student interns after their experience. The guide can be used and adapted by others to design inclusive and youth-focused Climate Cafés.
4	Facilitating Conversations about climate crisis	The CCC-CATAPULT project identified the need to make spaces for, and provide ways to support, dialogue between young people and older generations about climate crisis. The conversation cards are designed to support educators through providing a structure to facilitate discussion and activities.
5	Storytelling processes: narrative, deep mapping methods	Storytelling is a traditional form of communication and offers a more indirect way of exploring young people's values and agency. In the CCC-CATAPULT project, it was the third stage in the data collection with young people. This set of resources shares both the storytelling process that was developed and some drawings and quotes from young people's stories in CCC-CATAPULT's research. The aim of the tool is to encourage others to use the methods and/or discuss themes that emerged in young people's creative visioning of future positive places for learning within the climate crisis.
6	Running focus groups with young people	Focus groups with young people were the second stage of data collection in the CCC-CATAPULT project, after a larger-scale survey. This guide is written for those who want to set up focus group discussions as part of a methodology in researching with young people to discuss the climate crisis.

Number	Name	Description
7	Including youth in climate policy making	A key element of the CCC-CATAPULT project was the engagement of policymakers concerned with young people's learning in the climate crisis. This involved young people and researchers working with policymakers at regional and national levels. This resource shares ways of including young people in policy making and valuing in their contributions.
8	Teaching with worldviews/values	The CCC-CATAPULT project found that developing young people's values and worldviews is an important part of climate change education, alongside teaching of knowledge and skills. This set of resources supports educators to consider values and worldviews in their approaches to climate change education for young people. The material can be used in teacher education.