



Teaching climate change and sustainability

A survey of teachers in England



ACKNOWLEDGEMENTS

We would like to thank the teachers and head teachers who participated in this research. We are grateful to many colleagues at IOE, UCL's Faculty of Education and Society, for contributing to the development of the questionnaire and this report, in particular: Nicola Bretscher, Janet Davies, Justin Dillon, David Godfrey, Rebecca Hale, Jeremy Hodgen, Dima Khazem, Jeff Marks, David Mitchell, John Morgan, Marian Mulcahy, Michael Reiss, Michael Riley, Hans Svennevig, Becky Taylor and Tessa Willy. We are also grateful for the input of Postgraduate Certificate in Education (PGCE) students, teacher educators, and teachers who participated in the pilot studies. The survey was made possible with funding from the University College London IOE Strategic Investment Fund.

To cite this report: Greer, K., Sheldrake, R., Rushton, E., Kitson, A., Hargreaves, E., Walshe, N. (2023). *Teaching climate change and sustainability: A survey of teachers in England*. University College London, London, UK. The report can be accessed at: www.ucl.ac.uk/ioe/departments-and-centres/centres/ucl-centre-climate-change-and-sustainability-education

Contents

Acknowledgements	2
Summary of findings	4
1. Introduction	6
1.1 Research aims	6
1.2 Research context	7
2. Methods	10
2.1 The questionnaire	10
2.2 Data analysis	10
2.3 The respondents	11
3. Results	13
3.1 Teachers' practice	13
3.2 Teachers' professional development	27
4. Reflection: Opportunities for enhancing climate change and sustainability teaching in England	33
4.1 Moving teacher professional development beyond 'self-taught'	33
4.2 The untapped potential of initial teacher education	34
4.3 Extending teachers' practice outside the classroom	36
4.4 Empowering school leaders	37
4.5 Building on the National Curriculum	37
5. Concluding remarks	39
6. References	40

Summary of findings

This report shares detailed findings as to the current state of climate change and sustainability education in England in 2022-23, with a particular focus on teachers' practice and professional development. The results reveal both strengths and gaps in the provision of climate change and sustainability education in England. The report serves as an evidence base for researchers, policymakers and practitioners who seek to support teachers to fulfil their important roles in society's transformation to a sustainable future.

UCL's Centre for Climate Change and Sustainability Education (CCCSE) conducted a survey of teachers in England entitled 'What do climate change and sustainability education have to do with me?'. Between October and December 2022, teachers were invited to respond to an online questionnaire about their views and experiences. Teachers were recruited through email lists, professional networks, social media and via the CCCSE website. The questionnaire investigated their teaching practice, professional development, and sense of confidence and preparedness to incorporate climate change and sustainability into their teaching. It included a range of question types and generated quantitative and qualitative data.

The survey gathered 870 responses, with over two thirds (70.7%) teaching at secondary level, and geography (41.3%) and science (37.2%) being the most frequently reported subjects taught. Those who responded represented a wide range of teaching experience, from one year to 20+ years, with university-led PGCE programmes the most commonly reported route into teaching (87.2%). The significant majority of respondents were female (73.9%) and from white backgrounds (90.5%).



Professional development

- Less than half of the respondents (44.9%) reported participating in formal professional development related to climate change and sustainability.
- Less than 13% of respondents reported that their Initial Teacher Education (ITE) included a focus on climate change and sustainability.
- Of those who have participated in climate change and sustainability focused professional development, the most frequently reported type was 'self-taught'.

These findings highlight significant gaps in professional development related to climate change and sustainability education. Access to high quality professional development for teachers of all subjects and at all levels should be a priority for enhancing climate change and sustainability education in schools.

Curriculum

- Teaching related to climate change and sustainability was most prevalent in geography and in science, and at secondary level.
- Teaching related to climate change and sustainability was included to a lesser extent in subjects such as citizenship, art and design, business studies, design and technology, English/literacy and personal, social, health and economic education (PSHE).
- The majority of respondents said that it was a priority for climate change and sustainability to feature more strongly in the National Curriculum. This was particularly the case for those teaching at primary level and for those, whether at primary or secondary level, teaching subjects other than geography or science.

These findings highlight the potential to establish and/or extend practice in all subjects in order to enhance school-based climate change and sustainability education across the curriculum.

Outside the classroom

- School buildings, their grounds and other outdoor settings were not frequently used by respondents to support their climate change and sustainability teaching; this was particularly the case in secondary schools.
- However, respondents recognise the potential of these settings for supporting climate change and sustainability teaching in schools.
- The three outside the classroom activities most frequently reported by teachers to support their teaching related to climate change and sustainability were: encouraging students to take their learning home; students participating in projects to improve school sustainability or environment; and students participating in school decision-making around sustainability.

These findings indicate that whilst outside the classroom settings and activities can provide a strong foundation for enhancing the engagement of the school community in climate change and sustainability education, their potential is not always realised.

1. Introduction

“To disrupt the current pace of environmental destruction and climate change, we cannot continue to do the same things that we’ve been doing; we cannot continue to be the same people; and, we cannot continue to be the same teachers.”

(Jickling & Blenkinsop, 2020, p. 122)

Education, including formal schooling, is widely understood to be central to the development of the knowledge and skills that children and young people need to live sustainable lives and respond to the challenges of climate change. The teaching they have access to is crucial for that development. Teachers and their professional development are, therefore, central to effective climate change and sustainability education. Initial teacher education (ITE) and continuous professional development (CPD) related to climate change and sustainability can enhance teachers’ capabilities to support education’s role in the large-scale change that is needed to transform people and cultures to more environmentally and socially sustainable ways of being. However, to maximise the effectiveness of ITE and CPD, it is first important to understand current perspectives and practice in relation to climate change and sustainability education.

This report examines the views and experiences of teachers in England, and highlights opportunities to enhance climate change and sustainability focused professional development at all stages of teachers’ careers. It is structured as follows: following the Introduction, Section 2 summarises the research methods, including the survey design process and the methods of analysis; Section 3 presents the analysis; and Section 4 discusses key issues relevant to climate change and sustainability education in schools.

1.1 Research aims

The purpose of the survey was to generate new insight into the state of climate change and sustainability education in England. It was guided by the following questions:

1. Who is engaged in school-based teaching related to climate change and sustainability in England?
2. How are climate change and sustainability incorporated into current teaching practice in schools in England?
3. What is the nature of professional development related to climate change and sustainability for teachers in England?
4. What opportunities exist to enhance climate change and sustainability education in schools in England?



1.2 Research context

1.2.1 Climate change education and sustainability education

Climate change education and sustainability education aim to generate understanding of the wide-ranging, interconnected, environmental and social issues that define our time, and support people's capabilities for acting in response to those issues. They can be understood as broad, pluralistic approaches to education.

Climate change education is described in the research literature as a range of approaches that differ between countries and contexts, between schools and across disciplines. However, in a systematic review of 49 studies that considered the efficacy of climate change education programmes, Monroe et al. (2019) found that most programmes focused on improving students' knowledge about climate change through formal education. Their synthesis identified two overarching strategies for increasing the efficacy of climate change education programmes: (1) a focus on personally relevant and meaningful climate change information and, (2) use of student-centred, active, and engaging teaching methods. Rousell and Cutter-Mackenzie-Knowles (2020) identified a similarly strong emphasis on scientific knowledge in their systematic review of 220 research papers published between 1993 and 2014. They found that nearly half of the studies specifically referred to increasing scientific knowledge as the primary framing, and that school-based science education was the dominant context. Yet, there is a need to move beyond an over-emphasis on learning the science of climate change not least because this focus does not necessarily translate into pro-environmental attitudes and behaviours (e.g., Brownlee et al., 2013). These reviews, alongside other research, emphasise the need for holistic, participatory, and creative approaches to climate change education that foreground concerns for justice and advocacy for the environment and that draws on multiple disciplines.

Sustainability education can be understood as education that supports citizens of today to live in ways that do not cause environmental harm, rather to live environmentally restorative lives that maximise opportunities for life on a healthy planet now and in the future. Like climate change education, sustainability education is understood and enacted variously. It can be construed as transformative, by seeking to challenge the unsustainable structures and values that govern institutions and individuals (e.g., Lotz-Sisitka et al., 2015). Often, it is framed in terms of whole-school approaches (e.g., Wals & Mathie, 2022) that involve actions across a range of dimensions such as:

- governance and leadership which can include vision statements, policies and strategies that communicate and actively support sustainability across the school;



- operations including actions that improve the sustainability of school buildings and grounds, energy, waste, water, biodiversity, transport, and procurement;
- teaching and learning that involves teachers and teaching teams, supported by school leadership, to develop content and pedagogy to integrate sustainability across the curriculum; and
- community engagement and partnerships to support learning about and contributing to sustainability through incursions or excursions, community projects, or engaging parent communities in schoolground improvements (examples in England include [SEEd](#)¹, [GreenSchools Project](#)² and [EcoSchools](#)³).

Elsewhere, sustainability education can be viewed in terms of developing competencies or, in policy discourse, in terms of ‘green skills’ (e.g. Department for Education [DfE], 2022).

Subject-based approaches are also an important part of climate change and sustainability education. Disciplinary-knowledge rooted in a subject-based curriculum has the potential to provide a range of distinctive perspectives which collectively equip young people to think critically, empathetically and imaginatively about the challenges of climate change and sustainability. Whilst wider research underlines the value of whole-curriculum approaches, in England⁴ the organisation of the secondary curriculum lends itself to a more subject-based approach. Although opportunities for cross-curricular and holistic approaches have tended to be more apparent in the primary and Early Years Foundation Stage (EYFS) contexts, primary schools are also expected to have strong disciplinary focus with Ofsted evaluating the extent to which the ‘curriculum is coherently planned and sequenced towards cumulatively sufficient knowledge and skills for future learning and employment’ (Ofsted, 2022, no page). Therefore, in England, recognising and supporting quality subject-based approaches is key to enhancing climate change and sustainability education in schools.

1.2.2 Policy context in England

Currently, in England, the National Curriculum includes climate change and sustainability in secondary geography and science (Dawson et al., 2022) and, in principle, it affords teachers flexibility to incorporate related content across their teaching (DfE, 2014) (discussed further in Section 4). In addition to the curriculum, the UK Government’s *Sustainability and climate change strategy for the education and children’s services system* (DfE, 2022) sets out priorities for England across five action areas (Climate Education, Green Skills and Careers, Education Estate and Digital Infrastructures, Operations and Supply Chains, International) and three key initiatives (National Education Nature Park, Climate Action Awards, Sustainability Leadership). Amongst the action areas and initiatives, and of key interest for this survey, is the strategy’s commitment to provide ‘additional support to teachers of all levels’ in relation to climate change and sustainability education (ibid., no page).

1 <https://se-ed.org.uk/our-work/whole-institution-school-approach-sustainability/>

2 <https://www.greenschoolsproject.org.uk/>

3 <https://www.eco-schools.org.uk/>

4 In England, schooling is organised in levels and stages: early years foundation stage (3 – 5-year-olds); primary school includes Key Stage 1 (5 – 7-year-olds) and Key Stage 2 (7 – 9-year-olds); secondary school includes Key Stage 3 (12 – 14-year-olds), Key Stage 4 (14 – 16-year-olds) and Key Stage 5 (16 – 18-year-olds). Key Stage 5 is a term used to describe Year 12 and Year 13, although it is not formally used in the National Curriculum.

1.2.3 Teachers' views and experiences of climate change and sustainability education

Recent polling in England has identified an appetite amongst students and teachers to enhance the provision of climate change and sustainability education in schools and has highlighted that teachers would like access to more support and training (SOS-UK, 2021; YouGov, 2019). However, these polls do not provide a detailed picture of the current state of teachers' related practice or their professional development experiences. Research by Howard-Jones and colleagues (2021) offers further insight; their survey of teachers in England (n = 626), found that most teachers (73.7%) were already discussing climate change with their students and that teachers are 'ready and willing to move forward with radical, action-oriented climate change education' (ibid, 2021, p. 1675). Whilst more than half of the teachers were encouraged by their schools to teach or discuss climate change with their students, only 32% of the teachers outside of science and geography felt sufficiently resourced to do so. Thus, whilst under-resourcing in a general sense appears to be constraining teachers' practice, little is known about the opportunities for professional development related to climate change and sustainability education in England that could help to alleviate that resourcing need.

1.2.4 Summary

Climate change and sustainability education are variously understood, but there is widespread recognition that whole-school approaches are important. In England, climate change and sustainability education frequently occur as part of a subject-based curriculum with an emphasis on scientific knowledge. However, support is needed for all teachers to develop subject-based content and pedagogy so they can contribute to effective holistic, whole-curriculum, climate change and sustainability education. The calls from teachers and students to enhance climate change and sustainability education in schools, and for the necessary resources, are reflected in recent policy activity in England. Therefore, this survey is timely as it captures current practices and needs of teachers in England, which can inform policy implementation and ongoing policy development in this area, especially in relation to teacher professional development.



2. Methods

2.1 The questionnaire

The questionnaire gathered teachers' views on climate change and sustainability, their experience of incorporating climate change and sustainability in their teaching, and their related professional development experience. The research was conducted with approval from the UCL Research Ethics Committee (REC 1627), and data were managed in accordance with the UK GDPR and DPA 2018. The questionnaire design and content were informed by existing research (Howard-Jones et al., 2021; Jie Li et al., 2021; Teacher Tapp, 2019; UK Government, 2018). A variety of question types were used to facilitate engagement throughout the questionnaire and to maximise insight. The question types encompassed selecting options, selecting extents of agreement or disagreement for various statements, selecting frequencies of applying various aspects of teaching, and open text fields for sharing views and experiences.

The questionnaire was accessed using the Qualtrics online platform. Responses were sought from teachers in England working across all subject areas and levels of schooling, between October and December 2022. Participants were recruited through a range of networks, social media channels and distribution lists, including the IOE, subject associations, and the DfE. Incentives were offered in the form of two randomly drawn cash prizes (£100 each) that could be used to purchase climate change and sustainability teaching resources. Efforts were made to gather responses from teachers with varied experiences of climate change and sustainability education; nevertheless, it is more likely that those who are already engaged in teaching related to climate change and sustainability responded to the survey and so the results should be construed as representative of the sample, rather than representative of teachers in England as a whole.

2.2 Data analysis

This report shares findings from the first phase of analysis which focused on the quantitative aspects of the questionnaire responses. The analysis quantified overall responses and explored similarities or differences in views and experiences of those teaching or not teaching subjects and levels; for example, views from those currently teaching geography were compared to views from those not teaching geography, and views from those currently teaching at secondary level were compared to views from those not teaching at secondary level. For questions that sought responses across Likert scales, analysis involved considering extents (including via 1-5 scales where 1 reflected 'strongly disagree' and 5 reflected 'strongly agree') and considering proportions (including via percentages of those selecting 'agree' or 'strongly agree' and percentages of those selecting 'often' or 'very often').

The analysis explored differences in responses through cross-tabulations, and differences in averages through independent-samples tests (without assuming equal variances across the groups of respondents being considered). Magnitudes of difference were quantified through Cohen's D values, which are often interpreted as values below 0.20 reflecting minimal differences, values from 0.20 to 0.50 reflecting small differences, values from 0.50 to 0.80 reflecting moderate differences, and values above 0.80 reflecting large differences (Cohen, 1988). Statistical significance was shown through p values, which broadly convey the extent of statistical uncertainty. The standard threshold for 'statistical significance' is a p value below 0.05. For the most part, statistically significant results have been included in this report.

2.3 The respondents

Responses were received from 870 teachers and headteachers across England. Respondents were not required to answer every question, with lower response rates in latter sections. The final set of questions, which investigated personal backgrounds and characteristics, were answered by between 508 and 528 respondents.

2.3.1 Demographics

The questionnaire was completed by 388 respondents identifying as female (73.9%), 131 as male (25.0%), and 6 non-binary and gender diverse people (1.1%). The remaining respondents did not provide this information. The higher proportion of females follows a similar trend to the teacher workforce in state-funded schools in England (75.5% female) (UK Government, 2022).

In terms of ethnicity, 467 respondents (90.5%) identified themselves as being from white backgrounds, 21 from Asian / Asian British backgrounds (4.1%), 18 from mixed backgrounds (3.5%), 4 from Black / Black British backgrounds (0.8%), and 6 from other backgrounds (1.2%). The remaining teachers did not provide this information. These proportions are also comparable to the workforce in state-funded schools in England where 90.3% of all identified as white, 5.1% as Asian and 2.4% identified as Black (UK Government, 2022).



2.3.2 Education and teaching experience

More than half the respondents reported a bachelor's degree as their highest qualification (274 respondents, 52.2%) and just under half reported a masters or a doctorate as their highest qualification (219, 41.7%). The majority of respondents (325, 62.0%) reported that they entered teaching via a PGCE programme in England, and through a university-led (306, 87.2%), rather than school-led, programme. Teachers reported a wide range of years of teaching experience since completing teacher education. The largest proportion reported 1-5 years of experience (157 respondents, 30.3%), 86 reported 6-10 years (16.6%), 85 reported 11-15 years (16.4%), 64 reported 16-20 years (12.4%), and 126 reported 20+ years (24.3%).

2.3.3 Current teaching (stage and level)

The most frequently reported subjects taught were geography (210 teachers, which was 41.3% of those who answered the associated questions), science (189, 37.2%), and personal, social, health and economic education (PSHE) including in tutor and/or form time (179, 35.2%). Just over one third of teachers (176, 34.6% of those who answered the associated questions) taught at early years and primary level; more than two thirds (359, 70.7%) taught at secondary level and a smaller proportion (27, 5.3%) taught at both primary and secondary levels.



3. Results

The results are presented in two parts – Teachers’ practice, and Teachers’ professional development – which are divided into sub-sections and include key findings. The results should be viewed as representing the views and experiences of a subset of teachers in England, rather than the broader teaching workforce.

3.1 Teachers’ practice

3.1.1 Inclusion of climate change and sustainability in teaching

KEY FINDINGS



- A significant majority of survey respondents reported including content related to climate change and sustainability into their teaching ‘sometimes’, ‘often’, or ‘very often’; less than one fifth reported they ‘never’ or ‘almost never’ include this content.
- Climate change and/or sustainability are most commonly included in geography teaching, followed by science teaching.
- Respondents teaching at the secondary level reported more frequent inclusion of climate change and sustainability content.
- There is a strong positive correlation between those whose ITE included a focus on climate change and sustainability and those who ‘often’ or ‘very often’ incorporated related content in their teaching.

The survey investigated the extent to which teachers incorporated climate change and sustainability into their teaching. Overall, **the largest proportion of respondents reported that they ‘sometimes’ included climate change (37.0%) and sustainability (35.9%) in their teaching**, whereas a smaller, but still significant, proportion reported that they ‘often’ or ‘very often’ included climate change or sustainability content (Table 1).



Table 1: Reported inclusion of climate change and sustainability in teaching.⁵

	Never	Almost never	Sometimes	Often	Very Often	Responses
I include content related to climate change in my teaching	8.6%	9.9%	37.0%	24.2%	20.3%	627
I include content related to sustainability in my teaching	7.9%	11.3%	35.9%	24.8%	20.3%	622
I am encouraged by school leaders to discuss climate change/sustainability in the classroom	16.3%	23.8%	31.6%	19.1%	9.3%	614
My students bring up climate change/sustainability in the classroom	6.3%	15.8%	44.9%	25.3%	7.7%	608
I plan my climate change/sustainability teaching with colleagues	27.6%	22.1%	27.9%	15.2%	7.2%	612
There is progression in teaching related to climate change and/or sustainability in my school	21.0%	21.0%	32.5%	18.7%	6.7%	609

Differences in inclusion of climate change and sustainability by current teaching (subject and level)

Respondents currently teaching geography at any level of schooling reported more frequent inclusion of climate change and sustainability content in their teaching compared with those not teaching geography. Specifically, respondents who teach geography were more likely to report that they 'often' or 'very often' incorporated climate change and sustainability content in their teaching, received encouragement by school leaders to do so, experienced their students raising climate change/sustainability in the classroom, and planned climate change/sustainability teaching with colleagues (Table 2). Respondents who reported currently teaching science in any level of schooling reported similar frequencies of including climate change content compared to those not teaching science.

⁵ The table shows the percentage of responses for each of the categories that could be selected for each questionnaire item, and the number of responses for each questionnaire item. Higher percentages of responses per category are given darker shading.

Table 2: Reported inclusion of climate change and sustainability in teaching, across different subjects at any level of schooling.⁶

Questionnaire item	All responses	Art and design	English / literacy	Geography	History	Mathematics / numeracy	PSHE including tutor time	Science
I include content related to climate change in my teaching	44.5%	[-] 37.1%	[-] 27.2%	[+] 59.0%	[-] 32.1%	[-] 25.3%	[-] 37.4%	45.0%
I include content related to sustainability in my teaching	45.0%	38.9%	[-] 25.9%	[+] 57.9%	[-] 30.9%	[-] 25.5%	[-] 35.8%	40.2%
I am encouraged by school leaders to discuss climate change/sustainability in the classroom	28.3%	30.6%	31.0%	[+] 34.1%	33.6%	28.0%	32.8%	29.8%
My students bring up climate change/sustainability in the classroom	33.1%	27.7%	[-] 25.2%	[+] 48.1%	32.1%	[-] 20.8%	29.9%	[-] 26.6%
I plan my climate change/sustainability teaching with colleagues	22.4%	21.0%	[-] 16.1%	[+] 33.7%	20.1%	[-] 15.4%	20.3%	20.2%
There is progression in teaching related to climate change and/or sustainability in my school	25.5%	20.5%	[-] 19.4%	[+] 33.2%	20.1%	[-] 18.8%	23.2%	25.5%

The **inclusion of content related to climate change and sustainability was more frequently reported by respondents teaching at secondary level**, where 48.5% reported that they ‘often’ or ‘very often’ include content related to climate change and 48.3% reported that they ‘often’ or ‘very often’ include content related to sustainability (Table 3). Respondents who teach subjects other than science and geography less commonly reported inclusion of this content; for example, only 37.1% of those teaching art and design at any level of schooling ‘often’ or ‘very often’ include content related to climate change; 27.2% of those teaching English/literacy; 32.1% of those teaching history; 25.3% of those teaching mathematics/numeracy; and 37.4% of those teaching PSHE.

⁶ The table shows the percentage of those who selected ‘often’ or ‘very often’ for each questionnaire item. It shows responses across all levels and across those teaching particular subjects: art and design (159 respondents), English / literacy (158 respondents), geography (210 respondents), history (137 respondents), mathematics / numeracy (155 respondents), PSHE including tutor time (179 respondents), and science (189 respondents). Respondents may have reported teaching multiple subjects and may not have answered every questionnaire item.

[+/-] indicators show statistically significant differences ($p < .05$) across those reporting teaching the subject compared to those not teaching the subject. An indicator of ‘[-]’ shows where those teaching the subject reported lower compared to those not teaching the subject, and an indicator of ‘[+]’ shows where those teaching the subject report higher compared to those not teaching the subject.

Table 3: Reported inclusion of climate change and sustainability in teaching, across teaching in different subjects at secondary level.⁷

Questionnaire item	All responses	Art and design	English / literacy	Geography	History	Mathematics / numeracy	PSHE including tutor time	Science
I include content related to climate change in my teaching	48.5%	47.1%	[-] 18.2%	[+] 86.4%	32.3%	[-] 10.3%	45.1%	[+] 58.3%
I include content related to sustainability in my teaching	48.3%	61.8%	[-] 15.9%	[+] 84.5%	[-] 29.0%	[-] 12.8%	42.3%	48.8%
I am encouraged by school leaders to discuss climate change/sustainability in the classroom	25.3%	20.6%	19.0%	[+] 33.0%	26.7%	[-] 8.1%	25.7%	23.8%
My students bring up climate change/sustainability in the classroom	34.4%	30.3%	[-] 19.0%	[+] 68.6%	43.3%	[-] 2.8%	32.9%	26.2%
I plan my climate change/sustainability teaching with colleagues	22.5%	23.5%	[-] 7.1%	[+] 47.6%	16.7%	[-] 5.6%	20.0%	19.0%
There is progression in teaching related to climate change and/or sustainability in my school	27.8%	20.6%	19.0%	[+] 44.7%	[-] 13.3%	[-] 13.9%	25.7%	29.8%

⁷ The table shows the percentage of those who selected 'often' or 'very often' for each questionnaire item. It shows responses from those teaching at secondary level (359 respondents) and those teaching particular subjects at secondary level: art and design (34 respondents), English / literacy (44 respondents), geography (103 respondents), history (31 respondents), mathematics / numeracy (39 respondents), PSHE including tutor time (71 respondents), and science (84 respondents). Respondents may have reported teaching multiple subjects, and may not have answered every questionnaire item.

[+/-] indicators show statistically significant differences ($p < .05$) across those reporting teaching the subject compared to those not teaching the subject. An indicator of '[-]' shows where those teaching the subject reported lower compared to those not teaching the subject, and an indicator of '[+]' shows where those teaching the subject report higher compared to those not teaching the subject.

Respondents who reported that they include climate change and sustainability content in their teaching were then asked to indicate a frequency of inclusion across a range of subjects (Table 4).

Table 4: Frequencies of including climate change and/or sustainability in teaching by subject at any level of schooling.⁸

Current teaching	Rarely	Occasionally	Most commonly	Number of responses
Art and Design	33.6%	49.6%	16.8%	125
Business Education	25.0%	41.7%	33.3%	12
Citizenship	3.6%	43.6%	52.7%	55
Design and Technology	23.2%	52.6%	24.2%	95
English/Literacy	17.9%	67.9%	14.2%	134
Geography	0.0%	20.5%	79.5%	195
History	54.3%	36.2%	9.5%	105
ICT or Computing	53.2%	39.0%	7.8%	77
Mathematics/Numeracy	77.9%	18.3%	3.8%	104
Modern Foreign Languages	66.7%	22.8%	10.5%	57
Music	77.3%	19.7%	3.0%	66
PSHE including tutor time	6.3%	56.6%	37.1%	143
Physical Education	75.4%	14.5%	10.1%	69
Psychology	70.0%	20.0%	10.0%	10
Religious Education (RE)	44.2%	33.7%	22.1%	86
Science	3.6%	29.0%	67.5%	169
Sociology	37.5%	37.5%	25.0%	8
Something else	3.8%	34.6%	61.5%	26

Of those who reported teaching geography (at any level), the majority 'most commonly' (79.5%) included climate change and/or sustainability in their teaching, with some reporting that they 'occasionally' (20.5%) included it, and none reporting that they 'rarely' included it. In contrast, **the majority of respondents who reported teaching mathematics/numeracy, music, physical education, modern foreign languages, and history reported that they 'rarely' included climate change and/or sustainability in their subject teaching.**

⁸ The table shows reported frequencies of including climate change and/or sustainability in teaching via the percentage of responses for each of the available categories. The number of responses reflects those who reported teaching the subject (at any level of schooling) and who also answered the question about including climate change and/or sustainability in their teaching for that subject. For each questionnaire item, higher percentages of responses per category are given darker shading.

Differences in inclusion by professional development

Analysis considered differences in the inclusion of climate change and sustainability content into respondents' teaching according to their previous participation in professional development. Amongst respondents who reported they 'often' or 'very often' incorporate climate change and sustainability into their teaching, the analysis identified a **strong positive correlation between those who have participated in related professional development and those who 'often' or 'very often' incorporate such content in their teaching** (Table 5). This was particularly the case for respondents whose ITE included a focus on climate change and/or sustainability: 73.1% of these respondents reported that they 'often' or 'very often' include climate change content in their teaching, compared with only 38.4% whose ITE did not include this focus. Analysis also found that teachers who had participated in related CPD since becoming a teacher reported higher rates of incorporating it into their teaching than those who had not.



Table 5: Inclusion of climate change and sustainability in teaching, across reported professional development.⁹

Questionnaire item	All responses	Training during ITE	Training during NQT/ECT year / first year of teaching	Since becoming a teacher: departmental, INSET, CPD training	Since becoming a teacher: outside-school training	Since becoming a teacher: self-taught training
I include content related to climate change in my teaching	44.5%	[+] 73.1%	[+] 73.7%	[+] 64.8%	[+] 67.5%	[+] 56.3%
I include content related to sustainability in my teaching	45.0%	[+] 68.2%	[+] 73.7%	[+] 63.8%	[+] 68.5%	[+] 56.0%
I am encouraged by school leaders to discuss climate change/sustainability in the classroom	28.3%	[+] 41.8%	[+] 73.7%	[+] 45.3%	[+] 36.0%	[+] 32.2%
My students bring up climate change/sustainability in the classroom	33.1%	[+] 58.5%	[+] 68.4%	[+] 54.0%	[+] 44.4%	[+] 39.4%
I plan my climate change/sustainability teaching with colleagues	22.4%	[+] 42.4%	31.6%	[+] 37.5%	[+] 34.8%	[+] 27.6%
There is progression in teaching related to climate change and/or sustainability in my school	25.5%	[+] 43.1%	[+] 52.6%	[+] 41.7%	[+] 32.5%	[+] 30.0%

These results highlight that current climate change and sustainability teaching predominantly takes place in geography and science lessons, and at the secondary level. They show the potential for enhancing provision within other subject areas, particularly citizenship, art and design, business studies, design and technology, English/literacy and PSHE, and for seeking out opportunities in subjects where related content is 'rarely' included by respondents to this survey, such as mathematics, history or music.

⁹ The table shows the percentage of those who selected 'often' or 'very often' for each questionnaire item. It shows responses across all levels and across those who reported participating in professional development related to climate change and/or sustainability: through their ITE course (67 respondents), through their NQT/ECT or first year of teaching (19 respondents), through within-school training since becoming a teacher (128 respondents), through outside-school training since becoming a teacher (166 respondents), and through self-taught training since becoming a teacher (375 respondents). These numbers of respondents reflect the base, and each person may not have answered every questionnaire item.

[+/-] indicators show statistically significant differences ($p < .05$) across those reporting participation in the professional development compared with those who did not. An indicator of '[-]' shows where those who had participated in the professional development reported lower than those who had not, and an indicator of '[+]' shows where those who had participated in the professional development reported higher than those who had not.

3.1.2 Use of resources to support teaching

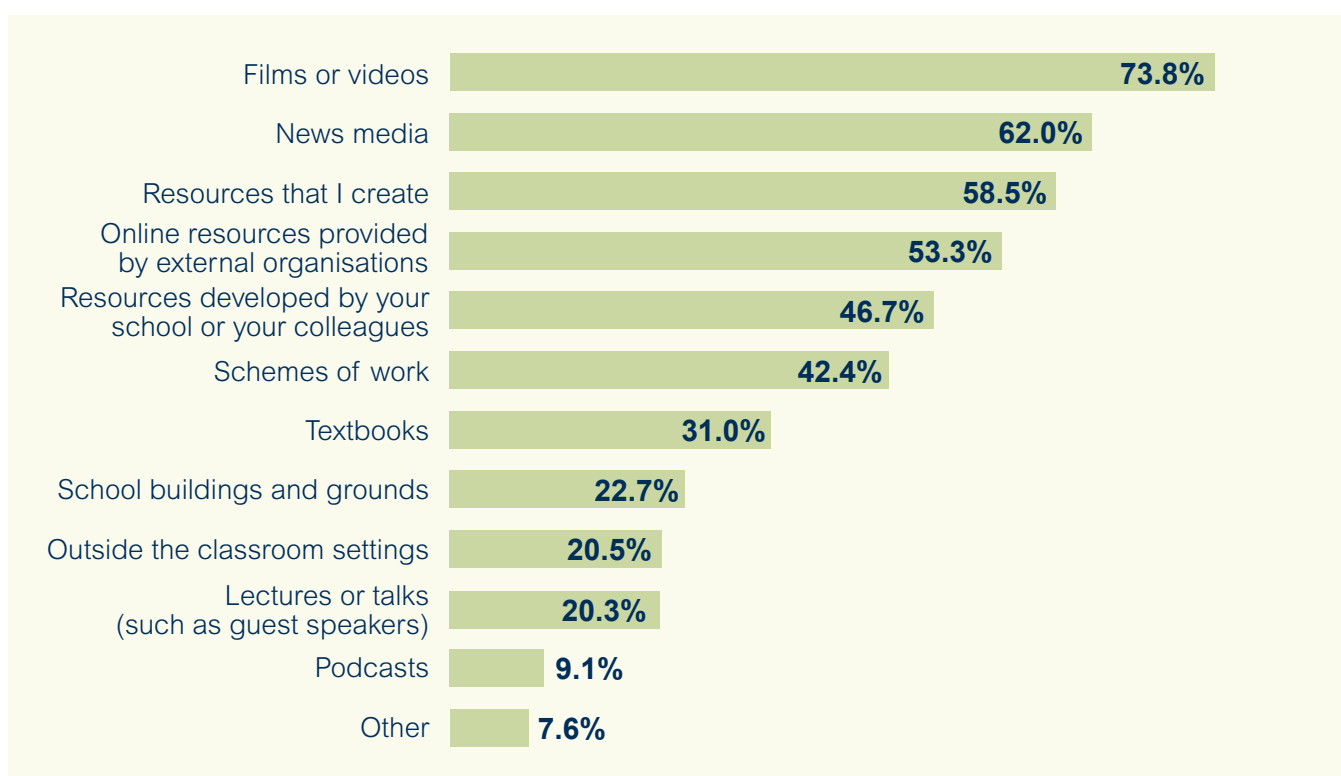
KEY FINDINGS



- The types of resources that respondents most frequently use to support teaching related to climate change and/or sustainability are ‘films and videos’, ‘news media’, ‘resources that I create’ and ‘online resources provided by external organisations’.
- School buildings, grounds and other outside the classroom settings showed relatively low levels of use as a teaching resource, and even lower levels of use by respondents teaching at the secondary level.
- Respondents who reported undertaking professional development related to climate change and sustainability reported using a wider range of resources than those who had not.

The survey asked respondents who reported including content related to climate change and/or sustainability in their teaching to indicate the types of resources they most commonly used to support this teaching. Across these responses, the **four most frequently selected resources were ‘Films and videos’ (73.8%), ‘News media’ (62.0%), ‘Resources that I create’ (58.5%), and ‘Online resources provided by external organisations’ (53.3%)** (Figure 1). These results draw attention to the importance of critical literacy skills for teachers (and students) which support them to critique the content and origins of these resources.

Figure 1: Use of resources to support teaching related to climate change and sustainability.¹⁰



¹⁰ The figure shows the percentage of respondents who selected that they used each resource. It includes responses from those who answered the array of questions (516 respondents).

School buildings and grounds (used by 22.7% of all respondents) and outside the classroom settings (used by 20.5% of all respondents) showed relatively low use as a teaching resource (Figure 1), and even lower use by respondents teaching at secondary level where school buildings and grounds were used by 19.0% of respondents. Respondents who teach geography at any level of schooling reported slightly higher use of school buildings and grounds and outside the classroom settings than those who did not. One notable comparison is that school buildings and grounds were used as a teaching resource by 26.5% of respondents teaching secondary geography compared with only 12.0% of respondents teaching secondary science.

Of further note is that the amount of professional development related to climate change and sustainability undertaken by respondents positively correlated with the range of resources they reported using (Table 6); in this way, **those who reported having participated in a type of professional development conveyed higher level of resource use compared to those who had not.**¹¹



¹¹ Except in the case of training during the first year of teaching, where similar resource use was reported by those who had undertaken such training and those who had not. However, the small sample of respondents who reported having participated in such training limits the potential for determining significant differences.

Table 6: Use of resources to support teaching related to climate change and sustainability, across reported professional development.¹²

Resource	Training during ITE	Training during NQT/ECT year / first year of teaching	Since becoming a teacher: departmental, INSET or continuing professional development	Since becoming a teacher: outside-school PD	Since becoming a teacher: self-taught PD
Lectures or talks	20.3%	29.4%	[+] 34.1%	[+] 34.2%	[+] 23.5%
Films and videos	[+] 87.5%	88.2%	77.0%	[+] 80.7%	[+] 76.5%
News media	[+] 73.4%	76.5%	67.5%	68.3%	[+] 66.0%
Podcasts	14.1%	23.5%	[+] 16.7%	[+] 16.1%	10.0%
Online resources provided by external organisations	51.6%	47.1%	61.1%	[+] 62.1%	[+] 57.1%
Textbooks	40.6%	29.4%	28.6%	32.3%	31.8%
Schemes of work	[+] 59.4%	47.1%	45.2%	46.0%	44.5%
Resources developed by your school or your colleagues	[+] 62.5%	52.9%	[+] 66.7%	[+] 57.8%	[+] 51.2%
School buildings and grounds	18.8%	35.3%	[+] 34.1%	[+] 34.8%	[+] 27.8%
Out-of-classroom settings	25.0%	41.2%	26.2%	[+] 31.1%	[+] 22.9%
Resources that I create	[+] 75.0%	58.8%	65.9%	[+] 75.8%	[+] 68.7%
Other	6.3%	17.6%	5.6%	7.5%	[-] 5.7%

These results highlight further avenues for supporting teachers to enhance their practice, including by supporting them to incorporate school buildings and grounds into their teaching related to climate change and sustainability. They also signal ways in which professional development across teachers' careers can support more expansive, varied teaching practice – in this case, through the use of a wider range of resources.

¹² The table shows the percentage of respondents who reported that they used each resource. It shows responses from those who reported different professional development in climate/sustainability: through their ITE course (67 respondents), through their NQT/ECT or first year of teaching (19 respondents), through within-school training since becoming a teacher (128 respondents), through outside-school training since becoming a teacher (166 respondents), and through self-taught training since becoming a teacher (375 respondents). These numbers of respondents reflect the base, and each person may not have answered every questionnaire item.

[+/-] indicators show statistically significant differences ($p < .05$) across those reporting participation in the professional development compared with those who did not. An indicator of '[-]' shows where those who had participated the professional development reported lower than those who had not, and an indicator of '[+]' shows where those who had participated the professional development reported higher than those who had not.

3.1.3 Use of outside the classroom activities



KEY FINDINGS

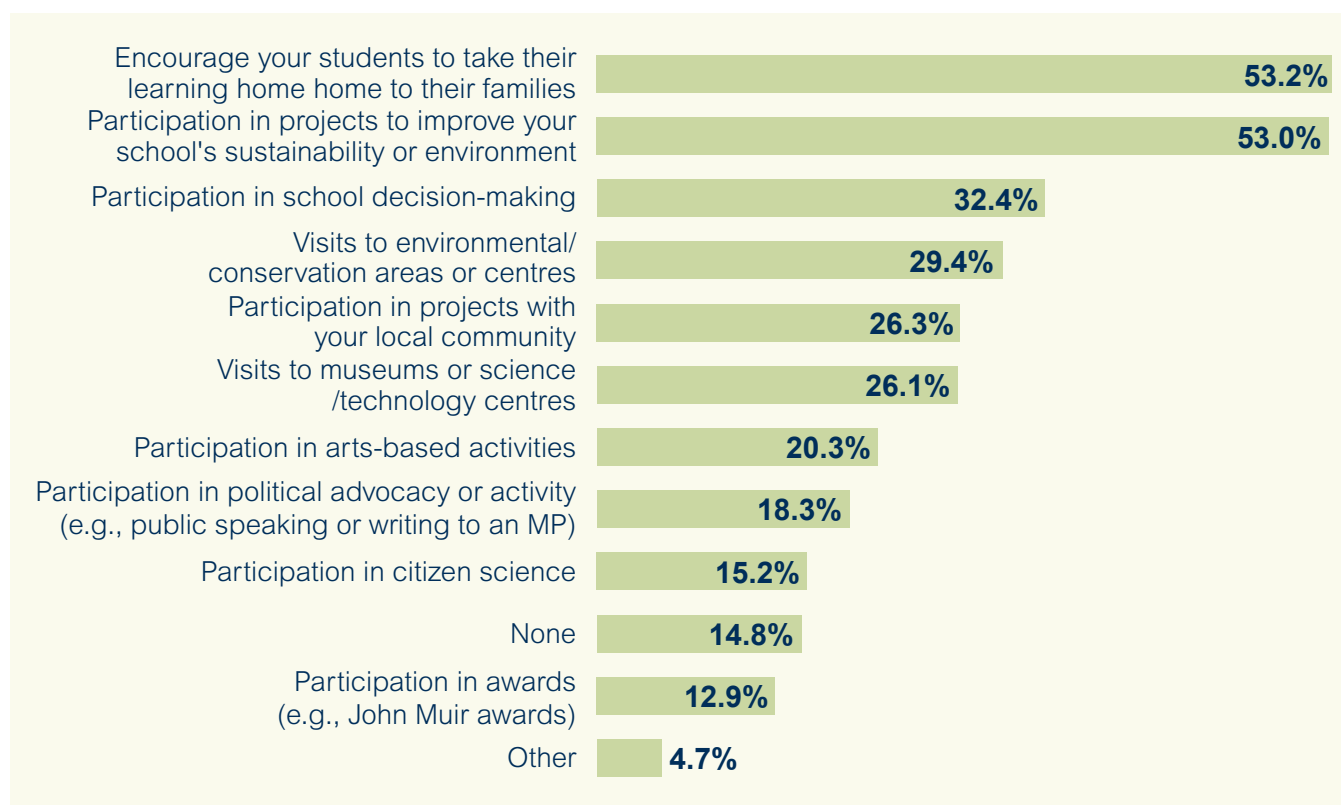
- The three most frequently used outside the classroom activities to support climate change and sustainability teaching were: encouraging students to take their learning home to families, students participating in projects to improve school sustainability or environment, and students participating in school decision-making.
- School buildings, grounds and outside the classroom settings showed relatively low use in relation to climate change and sustainability teaching, particularly by respondents teaching at the secondary level.
- Less use of outside the classroom activities to support teaching was reported by respondents currently teaching at the secondary level, compared to those teaching in other levels (except amongst those who reported teaching geography, where those teaching at primary and secondary reported similarly).
- There was a positive correlation between reported professional development related to climate change and sustainability and outside the classroom activities used to support teaching related to climate change and sustainability.

The questionnaire investigated the types of outside the classroom activities respondents used to support their teaching related to climate change and/or sustainability.¹³ Out of the 487 teachers who selected one or more items from the range of options, the majority (85.2%) indicated that they used at least one outside the classroom activity and only a small proportion selected 'none' (14.8%).

Across all responses, **the three most frequently selected activities were 'encourage your students to take their learning home to their families' (53.2%), 'participation in projects to improve your school's sustainability or environment' (53.0%), and 'participation in school decision-making' (32.4%)** (Figure 2).

¹³ This question was only available to those who had previously reported that they included content related to climate change and/or sustainability in their teaching.

Figure 2: Use of outside the classroom activities to support teaching related to climate change and sustainability.¹⁴



Differences in use of outside the classroom activities by current teaching (subject and level)

A higher number of outside the classroom activities to support teaching were used by respondents who teach geography at any level, when compared with those not teaching geography. Respondents who currently teach geography at any level report more use of participation in projects with local communities, more participation in projects to improve their school's sustainability or environment, more participation in school decision-making, and more encouragement for their students to take their learning home to their families (Figure 3). Respondents who currently teach science at any level of education (compared to those not teaching science) reported slightly less use, with the exception or more use of visits to museums or science/technology centres where 30.6% of science teachers reported the activity compared to 21.4% of those not teaching science.



¹⁴ The figure shows the percentage of respondents who selected that they used each activity. It includes responses from those who answered the array of questions (487 respondents).

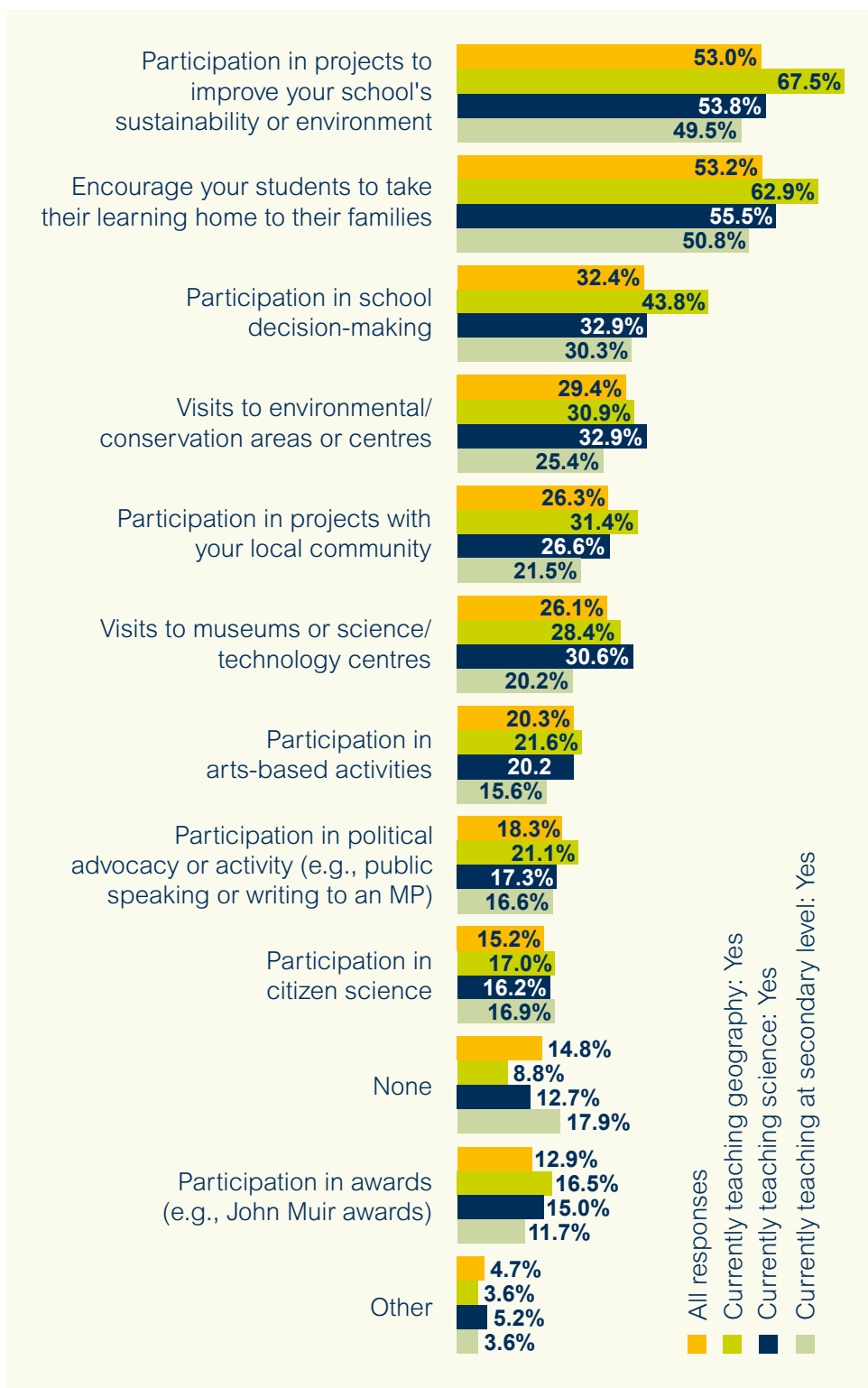
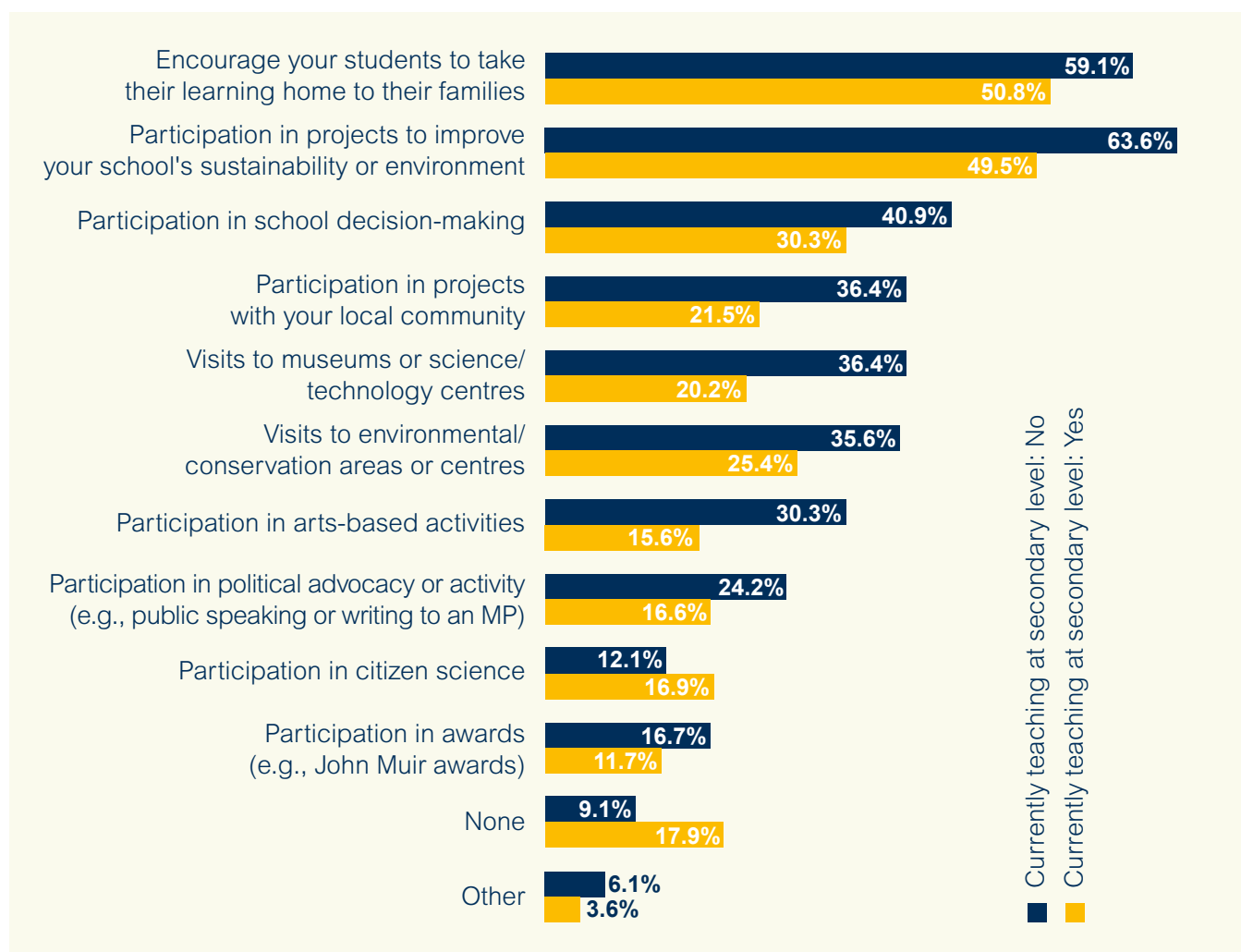


Figure 3: Use of outside the classroom activities to support climate change and sustainability teaching, across selected subjects and levels of teaching.¹⁵

Respondents who currently teach at the secondary level reported less use of most outside the classroom activities when compared with those not teaching at secondary level, except for those who teach geography (Figure 4). This includes: less use of visits to environmental/conservation areas or centres; less use of visits to museums or science/technology centres; less participation in arts-based activities; less participation in projects with local communities; less participation in projects to improve their school's sustainability or environment; and less participation in school decision-making.

¹⁵ The figure covers responses from those who answered the array of questions (487 respondents), and those who also reported currently teaching geography (194 respondents), currently teaching science (173 respondents), and currently teaching at secondary level (307 respondents); these numbers reflect those who reported teaching the subject or level and who also answered this array of questions.

Figure 4: Use of outside the classroom activities to support teaching related to climate change and sustainability, across teaching at secondary level.¹⁶



Differences in use of outside the classroom activities by professional development

The extent of respondents' professional development related to climate change and sustainability¹⁷ positively correlated with the number of outside the classroom activities they used to support their teaching. More specifically, analysis identified that more use of outside the classroom activities was reported by those who undertook CPD – including training offered by external organisations and self-taught training since becoming a teacher – compared with those who did not. Those whose ITE course included a focus on climate change or sustainability, or engaged in professional development during their first year of teaching post-qualification reported similar use of activities compared to those who did not.

These results highlight the limited engagement in activities outside the classroom to support teaching, despite the opportunities these types of activities present to expand and enhance climate change and sustainability education in schools. Incorporating these activities into a wider range of subjects and levels will support student learning that builds capabilities and skills. When coupled with more diverse resource use, these results indicate further potential opportunities for enhancing practice.

¹⁶ The figure shows the percentage of respondents who selected that they used each activity. It includes responses from those who reported currently teaching (359 respondents) or not teaching (149 respondents) at secondary level; each respondent may not have answered every questionnaire item.

¹⁷ The sum of reported professional development types on a 0-5 scale.

3.2 Teachers' professional development

3.2.1 Experiences of professional development

KEY FINDINGS



- Less than 13% of respondents reported a focus on climate change and sustainability during their initial teacher education (ITE) and the largest proportion of these respondents teach geography and/or at secondary level.
- Less than half of the respondents reported participating in formal professional development related to climate change and sustainability.
- 'Self-taught' was the most commonly reported type of professional development related to climate change and sustainability.
- Respondents who teach geography at any level of schooling reported that they had undertaken professional development related to climate change and sustainability more frequently than those who did not teach geography.
- Respondents who teach science at any level of schooling were less likely to report that their ITE course included a focus on climate change and sustainability than those not teaching science.

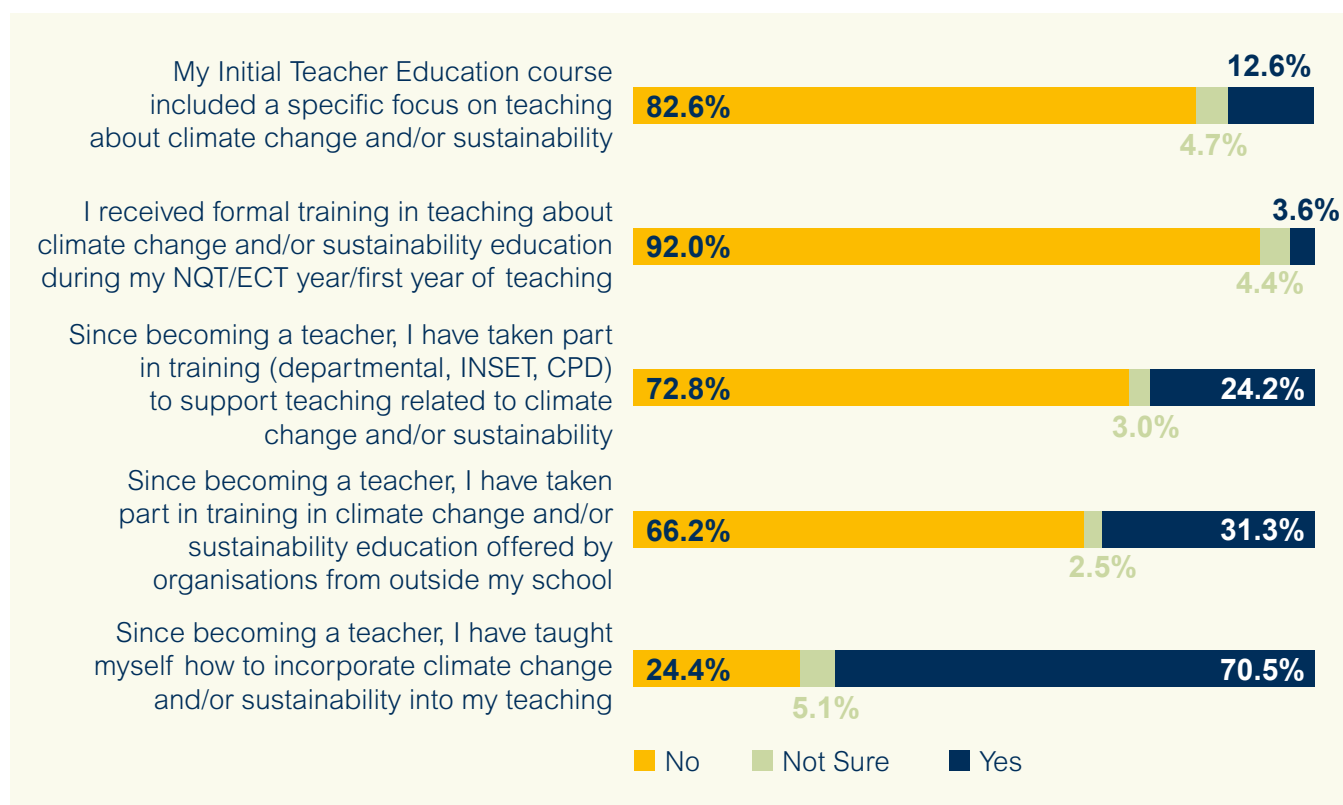
Respondents were asked to indicate the types of professional development related to climate change and sustainability that they had experienced. Overall, **less than half of the respondents (44.9%) reported participating in formal professional development related to climate change and sustainability.**¹⁸

Almost one quarter of the respondents (23.7%) reported that they had not participated in any professional development related to climate change and sustainability at all. Of those who had participated in related professional development, **the most commonly reported type was 'self-taught' (70.5%).** Further, amongst the cohort who had participated, **only 12.6% of these respondents reported that their ITE included a focus on climate change and sustainability**, with even fewer reporting participation in their first year post-qualification (3.6%). (Here, it is worth reiterating that respondents reported a wide range of years of teaching experience, therefore this finding relates to ITE over many years, not only to recent practice.)



¹⁸ In this instance, formal professional development includes: 'Initial Teacher Education course included a specific focus on teaching about climate change and/or sustainability'; 'formal training in teaching about climate change and/or sustainability education during my NQT/ECT year/first year of teaching'; 'training (departmental, INSET, CPD) to support teaching related to climate change and/or sustainability' (since becoming a teacher), and 'training in climate change and/or sustainability education offered by organisations from outside my school' (since becoming a teacher). The reference to informal professional development includes 'self-taught'.

Figure 5: Participation in types of professional development related to climate change and sustainability.¹⁹



Differences in professional development by current teaching (subject and level)

Of those who reported that they currently teach geography or science at any level of schooling, **more respondents who teach geography had undertaken professional development related to climate change and sustainability education of various types compared to those not teaching geography** (except for 'self-taught' development where those teaching or not teaching geography reported similarly). Analysis also identified that more of those teaching geography at the secondary level reported having undertaken professional development compared to those not teaching secondary geography, including through ITE courses that included a focus on climate change and sustainability (34.0% of those teaching secondary geography, compared to 9.5% of those not teaching secondary geography) and 'self-taught' development (84.8% compared to 69.3%). In contrast, **fewer respondents who teach science reported that their ITE course included a focus on climate change and sustainability** compared to those not teaching science. This is noteworthy given that climate change features in the National Curriculum for science. Finally, more **respondents who taught any subject at secondary level reported that their ITE course included a focus on climate change and sustainability compared to those not teaching secondary**.

¹⁹ The figure shows the percentage of responses for each of the categories that could be selected for each questionnaire item. It includes responses from all respondents.

These results indicate that respondents are heavily reliant upon 'self-taught' methods of professional development to support their climate change and sustainability teaching, while also revealing a lack of coverage of these topics within ITE programmes. They reflect the experiences of a cohort of teachers that are, generally speaking, engaged in climate change and sustainability education, including teachers of geography and science. It might reasonably be expected that such teachers would engage with these areas during ITE programmes, given the inclusion of climate change and sustainability in these subjects within the National Curriculum. In Section 4 we reflect on these results further in relation to the provision of ITE and CPD.

3.2.2 Teachers' priorities for support to enhance their teaching

KEY FINDINGS

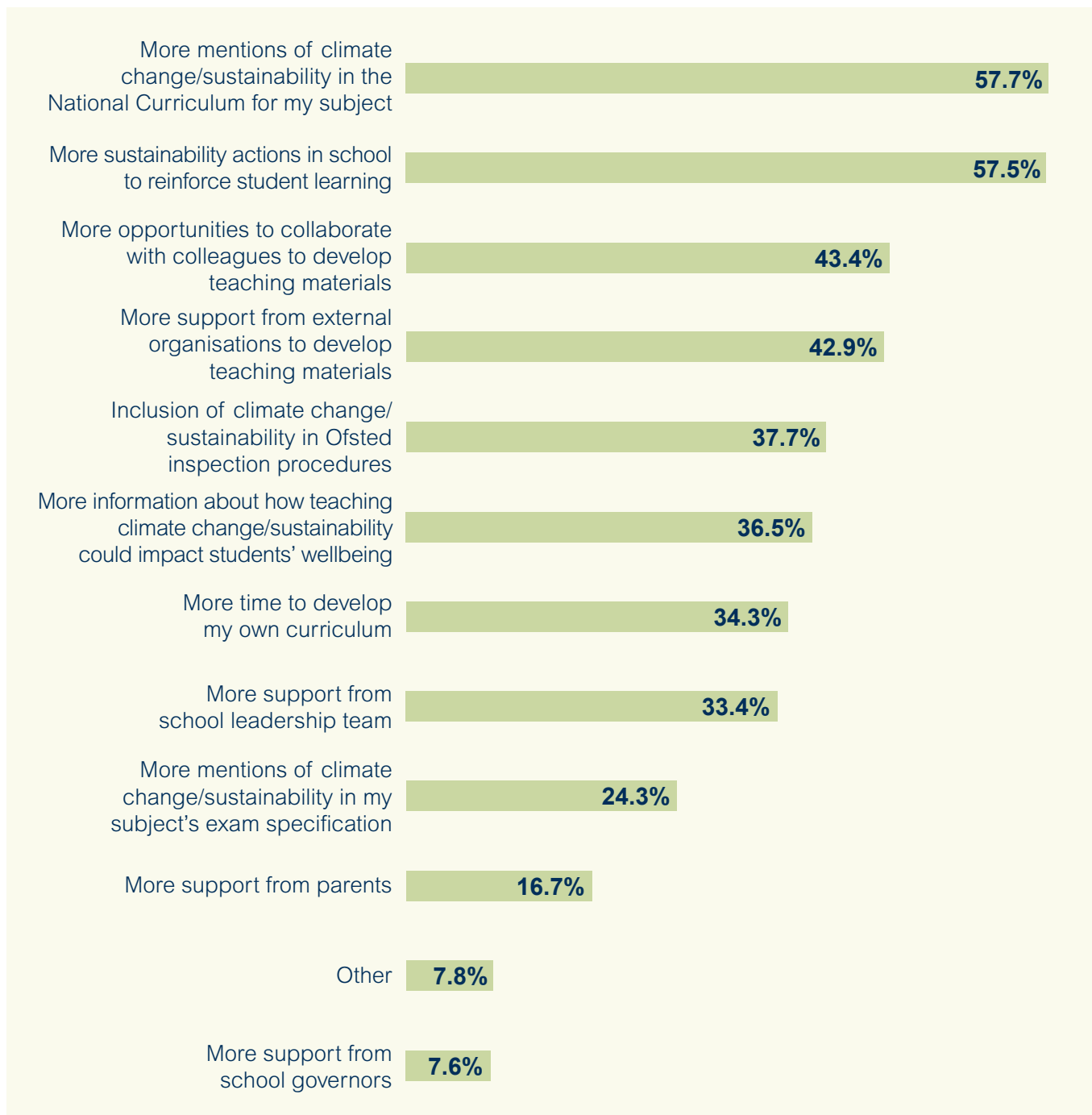


- More than half of the respondents selected 'more mentions of climate change and sustainability in the National Curriculum for the subject(s) I teach' as a 'top 5' priority for support; this was prioritised to a greater extent by those teaching at primary level than those teaching at secondary level.
- 'More mentions of climate change/sustainability content in the National Curriculum for the subject(s) I teach' was selected as a 'top 5' support priority by just over one third of those teaching science or geography at secondary compared with nearly two thirds of those teaching subjects other than science or geography at secondary level.
- More than half of the respondents selected 'more sustainability actions being taken in school to reinforce student learning' as a 'top 5' support priority.
- Just under half of the respondents selected 'more opportunities to collaborate with colleagues to develop cross-curricular teaching materials focused on climate change and sustainability' and 'more support from external organisations to develop teaching resources and strategies focused on climate change and sustainability'.

The survey asked respondents to prioritise the types of support that they would consider helpful to enhance their teaching related to climate change and/or sustainability, by selecting their 'top five' priority areas from a list of options. The most commonly selected priorities were for **more references to climate change and sustainability in the National Curriculum for the subject they teach (57.7%)**, and **more sustainability actions being taken in school to reinforce student learning (57.5%)** (Figure 6).



Figure 6: 'Top 5' priorities for support to help enhance teaching related to climate change and sustainability.²⁰

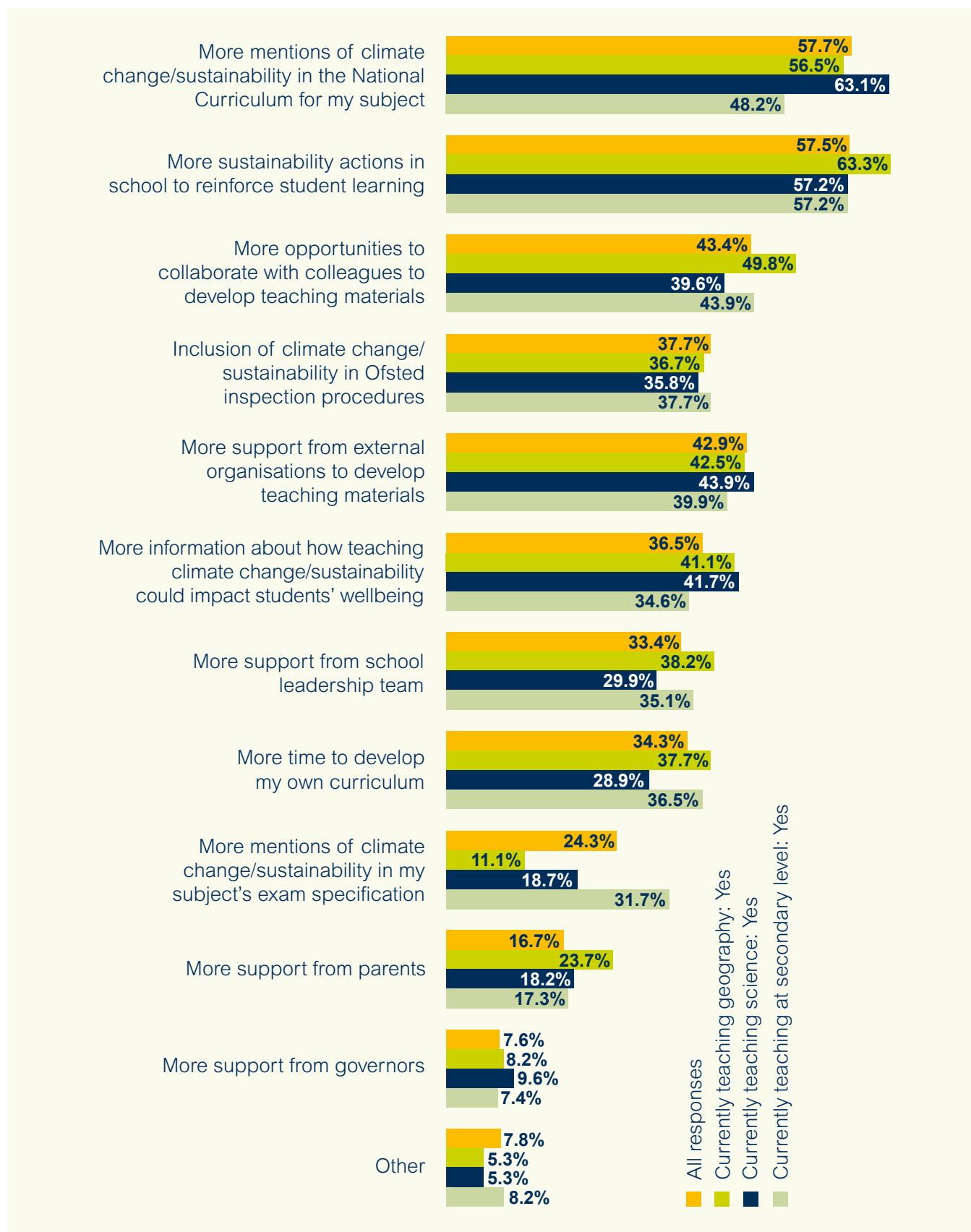


Differences in priorities of types of support by current teaching (subject and level)

Whilst there was general consistency amongst the priorities across subjects and/or levels (Figure 7), one notable difference was that **respondents who taught at primary level were significantly more likely to prioritise more mentions of climate change and sustainability content in the National Curriculum for their subject (77.7%)** compared with those who taught at the secondary level (48.2%).

²⁰ The figure shows the percentage of respondents who selected each area as a 'top 5' priority. It includes responses from those who answered the array of questions (539 respondents).

Figure 7: 'Top 5' priorities for support to help enhance climate change and sustainability teaching, across selected subjects and levels of teaching.²¹



²¹ The figure shows the percentage of respondents who selected each area as a 'top 5' priority. It includes responses from everyone who answered the array of questions (539 respondents), and responses from those currently teaching geography (210 respondents), those currently teaching science (189 respondents), and those currently teaching at secondary level (359 respondents). Each respondent may not have answered every questionnaire item.

Respondents who reported teaching at the secondary level were less likely to prioritise changes to the National Curriculum (compared with those not teaching secondary); and more likely to prioritise changes to exam specifications (compared to 6.1% of those not teaching secondary). Given that exams are concentrated within the secondary level of schooling, this latter difference is unsurprising. However, for **respondents who reported teaching in secondary, increased mentions of climate change and sustainability in their subject area's exam specification was more frequently prioritised amongst teachers of science (40.6%) and teachers of other subjects (36.3%), than it was for those who reported teaching geography (17.4%)**. Therefore, requests for changes to exam specifications appear to be subject-specific, more so than curriculum-wide. Furthermore, curriculum change was more frequently prioritised amongst those teaching at the secondary level who did not teach geography or science, than for teachers of geography or science (Figure 7). More specifically, **changes to the National Curriculum for their subject was selected as a 'top 5' priority by 59.4% of respondents teaching subjects other than secondary science or geography, compared with 36.7% of those teaching science or geography**.

These results indicate that many respondents would like to see changes to the National Curriculum and/or to exam specifications to support their teaching of climate change and sustainability. They also offer more nuanced insight into this common request for change in that the majority of the respondents who selected curriculum change as a priority teach subjects other than science and geography, and teach at the primary level. Therefore, they suggest that effort (be that related to curriculum change or to other types of support) might helpfully be focused on supporting teachers beyond secondary science and geography. Furthermore, the use of sustainability actions in school to reinforce student learning, as well as opportunities to collaborate with colleagues, provide helpful suggestions for school leaders wanting to support teachers to enhance their practice.



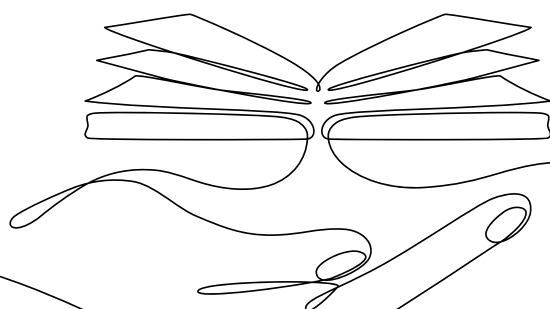
4. Reflection: Opportunities for enhancing climate change and sustainability teaching in England

This survey considers various features of the climate change and sustainability education landscape in England, with a particular focus on school-based teaching practice and related teacher professional development. Consistent with wider findings (e.g., Dawson et al., 2022), it finds that teachers of geography and science at the secondary level of schooling are the most likely to incorporate climate change and sustainability into their teaching, but it also reveals that teachers of other subjects are incorporating these topics, albeit to a lesser extent. It finds limited evidence that teacher professional development is available to support teachers of geography and science, or other subjects, to do more.

If young people in England are to have access to education that equips them to live sustainably and respond to the climate crisis, a more expansive, whole-curriculum approach to climate change and sustainability education in schools is needed. It must afford young people access to disciplinary and interdisciplinary knowledge and skills, advanced critical thinking and problem-solving capabilities, and a wide range of experiences so they can make choices about how they respond to climate change and live sustainability. As we set out in the following reflection, this will require changes in the content that is taught, and in the cohort of teachers who are engaged and equipped to incorporate climate change and sustainability into their teaching. This survey, therefore, makes a valuable contribution in the way that it enables opportunities for supporting such change to be identified. This section draws from the analysis and the research literature to reflect on five key opportunities for enhancing related teaching: (1) Moving teacher professional development beyond the 'self-taught', (2) The untapped potential of initial teacher education, (3) Extending teachers' practice outside the classroom, (4) Empowering school leaders, and (5) Building on the National Curriculum.

4.1 Moving teacher professional development beyond 'self-taught'

This survey reveals significant gaps in professional development related to climate change and sustainability teaching. Less than half of the respondents (44.9%) reported participating in formal professional development related to climate change and sustainability, and nearly one quarter of the respondents (23.7%) reported no participation in professional development at all. These results are notable given that the respondents represent an engaged cohort of teachers with more than 81.5% reported that they 'sometimes', 'often' or 'very often' incorporate climate change and sustainability in their teaching. Perhaps more significantly, however, is that of those who reported participating in professional development, most reported that the type of professional development was 'self-taught' (70.5%).



These results highlight the significant influence that self-directed and self-motivated professional development has on the provision of climate change and sustainability education, a situation that reflects its position outside the structures that support and determine school priorities. Whilst further analysis is needed to understand how 'self-taught' is conceived and experienced, and although self-directed development might be expected and encouraged in all professions, it is problematic to rely on these approaches. Individuals are limited by the structures they operate within and their capacity for pursuing such self-directed development will be constrained by these contexts. Most obviously, teachers who are not required by the curriculum to teach these topics are likely to be less motivated to pursue such development (possibly due to pragmatic time constraints) which will limit the potential to expand the cohort of engaged and equipped teachers. Furthermore, due to limited exposure to related professional development, teachers might have narrow conceptions of climate change and sustainability education which could, in turn, constrain the nature of the professional development that they pursue.

Various opportunities for professional development can thus be identified to support a wider cohort of teachers to incorporate climate change and sustainability into their teaching practice in alignment with, and building on, the existing curriculum. These include opportunities for:

- **Subject-and age-phase-specific professional development** for secondary and primary teachers which includes and extends beyond science and geography.
- **Professional development associated with teachers' pastoral responsibilities and form tutor roles.** The relatively high levels of engagement in climate change and sustainability through PSHE (56.6% of respondents reported 'occasionally' and 37.1% reported 'most commonly'), indicates possibilities for positioning climate change and sustainability as fundamental to a teachers' professional responsibility, in parallel with safeguarding (Rackley, 2021).
- **Communities of practice** that bring together teachers of different subjects and levels could provide mutually supportive and generative teacher professional development. Given that many respondents prioritised 'greater opportunities to collaborate with other staff to develop cross-curricula teaching materials' as a useful area of support, these communities could provide valuable avenues for professional development.
- **Diverse, high-quality resources** for teachers which reflect the global nature of climate change and support teachers' critical media literacy. The two most commonly used resources to support teaching are films and videos (73.8%) and news media (62.0%) which, as Puttick and Talks (2022) discuss, are often free and easy for teachers to use and share.

4.2 The untapped potential of initial teacher education

A second opportunity for enhancing teaching related to climate change and sustainability in England is through ITE. Noting that the majority of respondents completed their ITE via a university-based route (87.2%), the survey results indicated limited activity in these programmes related to climate change and sustainability. That is, about one in six respondents reported that their ITE programme included a focus on climate change and sustainability, rising to one in five for those who taught secondary geography. Given that this low reporting comes from an engaged cohort of teachers, who, in the case of geography and science teachers, are required by the National Curriculum to teach these topics, there is a clear opportunity to enhance this professional pathway. Analysis suggests that where climate change and sustainability is present

within ITE, it is reinforcing these topics within the realm of geography teachers more so than science, and much more than other subjects. However, if climate change and sustainability education is to draw on the expertise of a range of subjects (because responses to climate change and sustainability require a range of expertise), the siloing within geography and science at the beginning of a teachers' career could be reinforcing barriers to cross-curricular approaches in schools.

The report insights regarding ITE are limited given that few respondents completed a school-based ITE programme, and so further research is needed to better understand broader practice. Nevertheless, the analysis highlights the need for further policy development and support for the implementation of climate change and sustainability education across ITE. Currently, the DfE strategy (DfE, 2022) points to the Initial Teacher Training Core Content Framework (DfE, 2019b) and Early Career Framework (DfE, 2019a) as policy mechanisms which support climate change and sustainability within ITE. However, as Dunlop and Rushton (2022) have highlighted, in contrast with other ITE frameworks in the UK, neither of these documents specifically include climate change or sustainability education. Furthermore, a recent report by the Universities Council for the Education of Teachers (Vare et al., 2022) argues that teachers will not be equipped as they should be to teach in uncertain times, and recommends 'integrating the development of learners' awareness of – and their reactions to – sustainability and climate change without creating unnecessary workload be included at the very least' (ibid., 2022, p. 13). Further research could also investigate why some ITE courses may or may not incorporate climate change or sustainability, whether that be related to structures, capabilities of teacher educators, or of student teachers.



4.3 Extending teachers' practice outside the classroom

Outside the classroom activities are a third opportunity to enhance teaching related to climate change and sustainability education. The majority of respondents (85.2%) reported undertaking one or more outside the classroom activities to support their teaching, with high proportions of these teachers encouraging students to take learning home to their families or participating in projects to improve their school's sustainability or environment. There was consistently less reported activity in secondary compared with primary levels, particularly in relation to the use of school buildings and grounds and out of classroom settings to support teaching. Yet, analysis indicated that 'more sustainability actions being taken in school to reinforce student learning' was the second most frequently selected type of support amongst 'top 5' priorities (57.5%), after changes to the National Curriculum.

These results indicate that many respondents recognise the educational value of school buildings and grounds, which are views that could be harnessed to situate student learning beyond the constraints of the classroom to include learning within students' physical, everyday environments (Dillon, 2012). This is crucial as it is widely recognised that outside the classroom learning, which includes opportunities for students to have formative experiences in nature, has a lasting impact on attitudes towards the environment (e.g. Harris, 2021). As has been mentioned elsewhere in this report, this analysis does not offer explanations for the levels of engagement, although previous research (e.g., Dillon, 2012) has identified factors including self-efficacy, alongside time and financial resources, and suitability of school grounds. Thus, it is important to emphasise that any attempts to enhance this practice are not met with requests for teachers to simply do more. Constraints and barriers should be identified and taken into consideration in any initiative that seeks to increase sustainability activities in the school estate, such as the National Education Nature Park (DfE, 2022), and facilitate the use of school buildings and grounds and out of classroom settings in teaching. In so doing, such activities could have a generative impact on climate change and sustainability education in England, particularly in the way that it could support teachers of subjects other than geography and science, and in primary settings.



4.4 Empowering school leaders

The survey indicates opportunities for school leaders to provide additional support for teachers in relation to climate change and sustainability education. The results confirm findings of previous research (Gillow et al., 2022) which have indicated that, whilst many head teachers are broadly supportive of climate change and sustainability education, their priorities tend to rest elsewhere, particularly post-pandemic and in the context of severe financial restraint on school budgets. Amongst respondents, 40% of teachers reported that they are ‘never’ or ‘almost never’ encouraged by their school leaders to discuss climate change and sustainability with students. This is not to say that teachers are not supported, or are discouraged; however, it indicates a window of opportunity to encourage change at a whole-school level. Relatedly, there was limited attention to and recognition of the potentially valuable role that school governors can play in supporting and leading change within schools, with only 7.6% of respondents selecting ‘more support from school governors’ as a ‘top 5’ priority for support.

Leadership of climate change and sustainability education in schools can take shape in many ways, driven by a range of individuals in schools. Previous research (Dunlop et al., 2021) has found that teachers and students wanted climate change and sustainability education to feature in school policies (e.g., School Development Plan) and inspection guidance, an expectation that aligns the new DfE strategy that schools will have Sustainability Leads by 2025. However, this raises questions about who will undertake these roles and how they will be resourced and equipped. Harnessing the knowledge of the school community, including the diverse expertise that rests within governing bodies, offers potential leadership capacity within schools such that the responsibility for climate change and sustainability education can extend beyond individual teachers and school leaders. Indeed, the National Association for Environmental Education has published guidance to support this (Lee & Scott, 2020). Careful consideration of professional development opportunities and plans for resourcing this leadership is necessary to avoid burdening already hard-pressed school leaders and engaged teachers.

4.5 Building on the national curriculum

The final opportunity relates to curriculum. Research underlines that a curricular focus on scientific facts of climate change needs expansion, not least because teaching facts alone can increase young people’s feelings of helplessness and hopelessness (Ojala, 2012, 2015) which can lead to climate anxiety and apathy (Galway & Field, 2023; Ojala, 2013). In England, however, this framing persists in the National Curriculum (Glackin & King, 2020), and is reinforced in the new DfE strategy (2022), including through its commitment to a new GCSE in Natural History (Dunlop & Rushton, 2022). The survey results indicate that teaching related to climate change and sustainability continues to align with the National Curriculum by virtue of who completed the survey (41.3% taught geography, 37.2% taught science, 35.2% taught PSHE, 70.7% taught at secondary level) and reported teaching practice. Whilst in principle (and as mentioned in Section 1), the National Curriculum affords teachers flexibility to incorporate climate change and sustainability across their teaching (and academisation means that many schools are not required to follow it), the results indicate such flexibility is not flowing through to practice. Thus, explicit encouragement is needed which would be supported by curriculum change.

The survey results further strengthen the case for curriculum change whereby the largest proportion of respondents (57.7%) selected 'More mentions of climate change/sustainability content in the National Curriculum for my subject' as one of their 'top 5' priority areas for increased support. However, larger proportions of these respondents taught at primary level compared with secondary, and in subjects other than geography and science. Thus, targeted curriculum change that actively facilitates cross-curricula and cross-phase teaching and learning emerges as a key opportunity for strengthening the climate change and sustainability education provision in England. Any need for curriculum changes notwithstanding, research commissioned by Teach the Future (Catallo et al., 2022) has advocated for an 'action-oriented curriculum', an approach which teachers in England broadly support (Howard-Jones et al., 2021). This work pragmatically highlights immediate opportunities that align with the existing curriculum where teachers can support students' abilities to act in response to climate change.

Any discussion of the ways in which national curricula focus teachers' practice also needs to consider the influential role that examinations and assessments play within the school system in England, in particular as part of a wider 'assessment culture' which shapes teachers' practice (Perryman & Calvert, 2020) and workload (Walker et al., 2019). As reported above, only 24.3% of respondents identified changes to exam specifications as a 'top 5' priority for support; however, such change was more frequently prioritised amongst teachers of science and of other subjects at any phase of school than it was for teachers of geography (future analysis could consider these responses in relation to variation in exam specifications across subjects and phases). Whilst meaningful climate change and sustainability education extends well beyond what can be captured in exams and assessment, and previous research has identified that teachers and young people want them to be decoupled (Dunlop et al., 2022), in the shorter term, changes to exam specifications might well have an impact on the breadth of climate change and sustainability education that young people access. Consistent with the above curriculum discussion, the survey analysis prompts thinking about how to bring subjects beyond the usual suspects (in this case, geography and science) to the fore when teaching climate change and sustainability in schools.



5. Concluding remarks

This research provides a new baseline of understanding about the state of climate change and sustainability education in England and opportunities for future enhancement. These findings can be used by teachers, teacher educators and organisations who support teachers in their important contribution to society's transformation to sustainability. UCL's Centre for Climate Change and Sustainability Education will use these findings, and further analyses from the survey data, to inform the design of a suite of teacher professional development programmes for teachers, tailored by subject and age-phase. We will work with our school network to co-develop support for sustainability leadership in schools as they develop and implement climate change action plans. Furthermore, these results will inform ongoing policy discussions, including those related to the DfE's commitment to supporting teachers, as articulated through its *Sustainability and Climate Change Strategy*. Through this, we will strive towards an education system which enables our children and young people to learn for the environment and to develop capabilities and skills which enable them to contribute to a more sustainable and just future.



6. References

- Brownlee, M. T. J. J., Powell, R. B., & Hallo, J. C. (2013). A review of the foundational processes that influence beliefs in climate change: opportunities for environmental education research. *Environmental Education Research*, 19(1), 1–20. <https://doi.org/10.1080/13504622.2012.683389>
- Catallo, A., Lee, E., & Vare, P. (2022). *Curriculum for a Changing Climate: a track changes review of the national curriculum for England*. <https://tinyurl.com/35d4skc6>
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, New Jersey: Lawrence Earlbaum Associates.
- Dawson, V., Eilam, E., Tolppanen, S., Assaraf, O. B. Z., Gokpinar, T., Goldman, D., Putri, G. A. P. E., Subiantoro, A. W., White, P., & Widdop Quinton, H. (2022). A cross-country comparison of climate change in middle school science and geography curricula. *International Journal of Science Education*, 44(9), 1379–1398. <https://doi.org/10.1080/09500693.2022.2078011>
- DfE. (2014). *The national curriculum in England: Framework document*. Department for Education. <https://rb.gy/hkx5o>
- DfE. (2019a). *Early Career Framework*. <https://www.gov.uk/government/publications/early-career-framework>
- DfE. (2019b). *ITT core content framework*. Department for Education. <https://rb.gy/wg01v>
- DfE. (2022). *Sustainability and climate change: a strategy for the education and children's services systems*. Department for Education. <https://rb.gy/hv4z5>
- Dillon, J. (2012). Science, the environment and education beyond the classroom. In B. Fraser, K. Tobin, & C. McRobbie (Eds.), *Second International Handbook of Science Education* (Vol. 24, pp. 1081-1095.). Springer.
- Dunlop, L., Atkinson, L., Stubbs, J. E., Turkenburg-van Diepen, M. (2021). The role of schools and teachers in nurturing and responding to climate crisis activism climate crisis activism. *Children's Geographies*, 19(3), 291-299. <https://doi.org/10.1080/14733285.2020.1828827>
- Dunlop, L., & Rushton, E. A. C. (2022). Putting climate change at the heart of education: Is England's strategy a placebo for policy? *British Educational Research Journal*, 48(6), 1083-1101. <https://doi.org/10.1002/berj.3816>
- Dunlop, L., Rushton, E. A. C., Atkinson, L., Ayre, J., Bullivant, A., Essex, J., Price, L., Smith, A., Summer, M., Stubbs, J. E., Diepen, M. T. van, & Wood, L. (2022). Teacher and youth priorities for education for environmental sustainability: A co-created manifesto. *British Educational Research Journal*, 48(5), 952–973. <https://doi.org/10.1002/berj.3803>
- Galway, L. P., & Field, E. (2023). Climate emotions and anxiety among young people in Canada: A national survey and call to action. *The Journal of Climate Change and Health*, 9, 100204. <https://doi.org/10.1016/j.joclim.2023.100204>

- Gillow, E., Schwitzer, R., & Dorrell, E. (2022). *Teaching about climate change: A report in climate change and sustainability education in schools*. Public First. <https://rb.gy/s17iz>
- Glackin, M., & King, H. (2020). Taking stock of environmental education policy in England – the what, the where and the why. *Environmental Education Research*, 26(3), 305-323. <https://doi.org/10.1080/13504622.2019.1707513>
- Harris, F. (2021). Developing a relationship with nature and place: the potential role of forest school. *Environmental Education Research*, 27(8), 1214–1228. <https://doi.org/10.1080/13504622.2021.1896679>
- Howard-Jones, P., Sands, D., Dillon, J., & Fenton-Jones, F. (2021). The views of teachers in England on an action-oriented climate change curriculum. *Environmental Education Research*, 27(11), 1660–1680. <https://doi.org/10.1080/13504622.2021.1937576>
- Jie Li, C., Monroe, M. C., Oxarart, A., & Ritchie, T. (2021). Building teachers' self-efficacy in teaching about climate change through educative curriculum and professional development. *Applied Environmental Education and Communication*, 20(1), 34–48. <https://doi.org/10.1080/1533015X.2019.1617806>
- Jickling, B., & Blenkinsop, S. (2020). Wilding Teacher Education: Responding to the Cries of Nature. *Canadian Journal of Environmental Education*, 23(1), 121-138.
- Lee, E., & Scott, W. (2020). *Developing Sustainability: Helping school governors influence whole school approaches*. UK National Association for Environmental Education <https://naee.org.uk/feb-16-guidance-for-school-governing-boards/>
- Lotz-Sisitka, H., Wals, A. E. J., Kronlid, D., & McGarry, D. (2015). Transformative, transgressive social learning: Rethinking higher education pedagogy in times of systemic global dysfunction. *Current Opinion in Environmental Sustainability*, 16, 73–80. <https://doi.org/10.1016/j.cosust.2015.07.018>
- Monroe, M. C., Plate, R. R., Oxarart, A., Bowers, A., & Chaves, W. A. (2019). Identifying effective climate change education strategies: A systematic review of the research. *Environmental Education Research*, 25(6), 791-812.
- Ofsted. (2022, July 11). *Education Inspection Framework*. <https://rb.gy/fg6cl>
- Ojala, M. (2012). Hope and climate change: The importance of hope for environmental engagement among young people. *Environmental Education Research*, 18(5), 625–642. <https://doi.org/10.1080/13504622.2011.637157>
- Ojala, M. (2013). Emotional Awareness: On the Importance of Including Emotional Aspects in Education for Sustainable Development (ESD). *Journal of Education for Sustainable Development*, 7(2), 167–182. <https://doi.org/10.1177/0973408214526488>
- Ojala, M. (2015). Hope in the Face of Climate Change: Associations with Environmental Engagement and Student Perceptions of Teachers Emotion Communication Style and Future Orientation. *Journal of Environmental Education*, 46(3), 133–148. <https://doi.org/10.1080/00958964.2015.1021662>

- Perryman, J., & Calvert, G. (2020). What motivates people to teach, and why do they leave? Accountability, performativity and teacher retention. *British Journal of Educational Studies*, 68(1), 3–23. <https://doi.org/10.1080/00071005.2019.1589417>
- Puttick, S., & Talks, I. (2022). Teachers' sources of information about climate change: A scoping review. *Curriculum Journal*, 33(3), 378–395. <https://doi.org/10.1002/curj.136>
- Rackley, K. M. (2021, April 25). *School safeguarding policy should consider climate change and eco-anxiety*. Geogramblings. rb.gy/6jr9z
- Rousell, D., & Cutter-Mackenzie-Knowles, A. (2020). A systematic review of climate change education: giving children and young people a 'voice' and a 'hand' in redressing climate change. *Children's Geographies*, 18(2), 191–208. <https://doi.org/10.1080/14733285.2019.1614532>
- SOS-UK. (2021). *Teach the Future: Teacher Training on Climate Education*.
- Teacher Tapp. (2019). *Teacher Stress and Saving the World from Climate Disaster*. <https://teachertapp.co.uk/articles/teacher-stress-saving-the-world-from-climate-disaster/>
- UK Government. (2018). *Teachers in primary and secondary school: TALIS 2018*. <https://rb.gy/r5yoi>
- UK Government. (2022). *School workforce in England*. <https://rb.gy/ipxz9>
- Vare, P., Oberholzer, L., Shamim Ahmad, M., Durham, H., James, J., Lee, H., Linse, C., Lofthouse, R., McGrath, S., Meehan, U., Ovenden-Hope, T., Price, L., Rolph, C., Sampson Chappell, L., Seymour, M., Smith, R., Sturrock, S., & Watson, K. (2022). *Golden Thread or Gilded Cage? An analysis of the Department for Education support for the continuing professional development of teachers*. Universities Council for the Education of Teachers (UCET).
- Vesterinen, M., & Ratinen, I. (2023). Sustainability competences in primary school education – a systematic literature review. *Environmental Education Research*. <https://doi.org/10.1080/13504622.2023.2170984>
- Walker, M., Worth, J., & Van, J. (2019). *Teacher workload survey 2019: Research brief*. <https://www.gov.uk/government/publications/teacher-workload-survey-2019>
- Wals, A. E. J., & Mathie, R. G. (2022). It takes a whole school. *American Scientist*, 110(4), 244–247. <https://doi.org/10.1511/2022.110.4.244>
- YouGov. (2019). *Oxfam Teachers Survey*. YouGov. <https://tinyurl.com/ezdje86u>





UCL Centre for Climate Change and Sustainability Education
IOE, UCL's Faculty of Education and Society
University College London
20 Bedford Way
London
WC1H 0AL



ucl.ac.uk/ioe/departments-and-centres/centres/ucl-centre-climate-change-and-sustainability-education



climateeducation@ucl.ac.uk



[@UCL_CCCSE](https://twitter.com/UCL_CCCSE)