Empowering teachers and fostering pupil climate action in Welsh primary schools

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Abstract

The Curriculum for Wales intends to help students understand and address climate change, but relies on teachers' knowledge and implementation thereof. This article focuses on "*The Lifecycle of My Clothes*", a unit of work (UoW) developed by academics and practitioners. The UoW aimed to increase students' awareness of the environmental impact of clothes and facilitate informed climate change action, delivered through cross-curricular pedagogy methods. Through post-intervention semi-structured interviews and focus groups with 17 teachers across four primary schools in South Wales, this article examines how pupils' knowledge, attitudes and behaviours towards clothing and the climate have changed since running the UoW, and whether it has empowered primary school teachers to deliver climate change education (CCE) within the framework of the Curriculum for Wales. Teacher responses were analysed within an interpretivist qualitative framework to identify emergent themes, with a reflexive stance maintained throughout the analysis. After the delivery of the UoW, teachers reported that pupils' knowledge, attitudes and behaviours towards clothing and the climate had improved significantly. Teachers felt more empowered to teach CCE through an increase in awareness and knowledge of how their actions can mitigate climate change, as well as reduced anxiety. The UoW was also cited by teachers as the driver for

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changes in their personal and professional lives, including their contributions to whole-school changes. We propose that engaging teachers in CCE can help them feel more confident in their teaching and proactive in climate mitigation.

KEYWORDS
climate change education, climate justice, curriculum for Wales, fast fashion

INTRODUCTION

Global temperatures are increasing rapidly, with 2024 the first year above the "safe limit" of 1.5°C (Hausfather, 2025). Increasing temperatures and destabilisation of global weather patterns are disproportionately affecting those who contribute the least to climate change (IPCC, 2023). Therefore, it is more important than ever to educate the global population about climate change and encourage climate justice and action to save the planet.

In Wales, where this research was conducted, a new curriculum became statutory for primary schools in September 2022. Among other aspects which have earned it praise, such as learner centrality and teachers as learning facilitators (Sinnema et al., 2020), the Curriculum for Wales (CfW) aimed to support young people to improve their attitudes and behaviours towards climate change, and act in ways to mitigate it (Welsh Government, 2020). However, delivery of the CfW is heavily reliant on practitioners' teaching in a cross-curricular manner and addressing issues such as climate change, which the literature shows most teachers do not feel confident to do (Howard-Jones et al., 2021). Additionally, given that primary school teachers play a major role in helping pupils develop an awareness of the environment and how to care for it (Mat Said et al., 2003), it is imperative that they possess strong environmental beliefs and are well-informed to teach CCE effectively in their classrooms (Martín-Ezpeleta et al., 2022).

This study explores how a unit of work (UoW) called "*The Lifecycle of My Clothes*" empowered primary school teachers to teach CCE within the framework of the new CfW. The study also explores the change in pupils' knowledge, attitudes and behaviours towards clothing and the climate following the UoW. The Unit of Work used in this study was developed collaboratively by academics at Swansea University and teachers from pioneer schools[1] to align with the CfW.

LITERATURE REVIEW

Lack of CCE in primary schools

To date, CCE has been mainly aimed at adolescents, with younger children being the least engaged (Monroe et al., 2019; Trott, 2019). The literature shows there is little research or policymaking surrounding environmental education for primary school age groups (Morrissey Gleeson & Morrissey, 2024), and therefore an increasing need to 'explore constructive learning environments for children' (Trott, 2019). Although teachers would favour starting climate change education with action at primary-school age (Howard-Jones et al., 2021), relevant policymaking to date has tended to focus on older learners. For example, although the 'Climate in the classroom – National climate education action plan' (University of

Reading, n.d.) claims to focus on learners aged 8 to 18 'in order to provide an initial point of focus', it concentrates primarily on secondary school learners.

Hoath and Dave (2022) argue that introducing climate change across educational cultures would ensure that the message is 'fully embedded and inclusive' in young people's lives. Martín-Ezpeleta et al. (2022) concur, stating that educational interventions in childhood help form pro-environmental attitudes which in time develop into pro-environmental behaviours. Martín-Ezpeleta et al. (2022) invoke the mere exposure effect (MEE) theory to explain why there will be a positive effect on young children from repeated exposure to CCE; although some concepts and vocabulary may be difficult for younger children, repeated exposure can facilitate their understanding (Bornstein & D'Agostino, 1994). MEE facilitates attitude formation with limited cognitive processing, and psychology literature shows repeated exposure to stimuli may lead to preference development (Harmon-Jones & Allen, 2001; Montoya et al., 2017), which undermines the view that young children are too young for CCE. In addition, previous studies involving primary school children have shown that they are able and interested in learning about and discussing the real-world issue of climate change (Karpudewan et al., 2015; Kumar et al., 2023).

The need for education on clothing and fast fashion

The recognition in the UN's Sustainable Development Goals (SDGs) of children as drivers of change for a sustainable future (2015) proves how influential they can be. Children form sustainable habits and behaviours from a young age (Hosany et al., 2022), influencing purchases made by their parents or guardians (John, 1999; Trikha & Saini, 2019). However, many consumers lack awareness of the damaging impact of fast fashion and the clothing industry has a damaging impact on the planet (Papasolomou et al., 2023). Even those studying fashion in higher education can display a lack of understanding of sustainability related to the fashion industry (Bennetta & Oeppen Hill, 2022).

A comprehensive review of 80 papers (Hosany et al., 2022) identified key contributors to children's sustainable behaviour; findings confirmed the significant influence of parental attitudes and behaviours. However, peer influence was also highlighted in the review; children's learning is shaped by observing the behaviour of their teachers and friends, and can even result in reshaping "their families' psychological predisposition and behaviours through the process of ecological resocialisation". Therefore, early integration of fast fashion into sustainability education could influence children's attitudes and behaviours towards their clothes.

The curriculum for Wales

Rolled out across primary schools in 2022, the Curriculum for Wales (CfW) provides an ideal opportunity for climate change education in primary schools. A notable strength is its cross-curricular approach, which enables a sustainability thread to be integrated through the different Areas of Learning and Experience (grouped subjects). The CfW aims for learners to become "ethical, informed citizens of Wales and the World" (Welsh Government, 2020) and offers opportunities for teachers to act with more agency, developing school curricula that address pupils' interests and take a place-based approach. However, this has placed considerable pressure on teachers, prompting many to search for "off-the-peg" resources that will help them meet the framework of the new curriculum and provide interesting lessons for their learners (Hughes & Lewis, 2020).[2]

The unit of work "*The Lifecycle of My Clothes*"

The Unit of Work (UoW) used in this study was developed collaboratively by academics at Swansea University and teachers from pioneer schools to align with the CfW (Ardoin et al., 2017). Activities were created for all Areas of Learning and Experience, providing options for a week's worth of lessons and ensuring that the sustainability focus was not just within science (see Figure 1). Whilst the beginning of the week focused on increasing students' knowledge about their clothes, subsequent activities drew learners' attention to their clothes' end of life, thus incorporating social justice into the curriculum. Activities in the second half of the week focused on actions that could be taken as a result of the knowledge learned, such as writing persuasive letters to government representatives and upcycling clothes. The mixture of knowledge acquisition, futures thinking and initiative to take collective action affords the opportunity to develop *action competence* in learners and teachers.

Action competence

Prior research has established a connection between children's sustainable behaviour and pertinent knowledge and attitudes (Ardoin et al., 2017). Subsequent studies demonstrate that sustainable behaviour is also associated with components integrated within what has been referred to as the Action Competence framework (Oinonen et al., 2025; Torsdottir et al., 2024). Action Competence was first reported by Jensen and Schnack (1997) as an alternative to the "traditional science-based approach to environmental education".

Primary School - Short Term Planning
Topic: The Life Cycle of Clothes
Recycling+

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
Immersion Day Bring your favourite clothes to school day	**Detectives Day** Materials: what are my clothes made of? Why?	**Here and There Day** The journeys that clothes make	**Drama Day** Perspectives in the world of the fashion industry: "what role do we play?"	**Fashion Day** Trends: fast and slow fashion
LLC Exhibit their clothes and express their opinion Spider Diagram: what do I know about my clothes?	**S&T** Investigation of fabric properties Discuss: Are "sustainable" and "biodegradable" properties? How do we measure this?	**Humanities** Quiz: Can you guess where X is made? Double sided cards (Clothes on one side, Country of origin on the other).	**LLC** Set up a class discussion about how to make the fashion industry more sustainable (role play, include multiple ideas and perspectives).	**EA** Discuss how to make your clothes last longer (How to look after my clothes) What is refashion & upcycling?
M&N Data Handling: looking at labels, collect data of origin and composition, and show results in bar charts/pie charts	**S&T** Rank fabrics' properties from most to least important when choosing what to buy (diamond ranking activity).	**Humanities** Atacama Desert Clothes Disposal Area (map journey) Comparing the life cycle of two different items: map their journeys from beginning to end.	**LLC** Use these perspectives to inspire a piece of writing: persuasion text or poster.	**EA** Design "The perfect uniform for a happy world". Children to make decisions on the origin and fabrics used to create an ethical sustainable uniform.
H&W Discuss results and log their opinions on the spider diagram: what have I learnt so far?	**S&T** What makes a piece of clothing the best buy and why?	**Humanities** Woollen Mills in Wales (Virtual) Trip to Woollen Mill.	**H&W** Arrange interview with expert "What can we do to improve our impact on the planet?" Discuss ideas and list benefits linked to their wellbeing.	**EA** Design project: use their own old clothes to make something new.

recycling.plus.res@gmail.com

FIGURE 1 The scheme of work for "*The Lifecycle of My Clothes*". The subject areas follow the CfW and are defined as follows: LLC = Language, Literacy and Communication, M&N = Mathematics and Numeracy, H&W = Health and Wellbeing, S&T = Science and Technology, EA = Expressive Arts. More information on the design of the UoW can be found in Ardoin et al. (2017).

Establishing that sustainable behaviour does not exclusively rely on knowledge and awareness, the article identifies four important components relating to students' abilities to act (i.e., their "action competence"): (1) knowledge/insight – acquiring knowledge about the problems, their causes and the available solutions; (2) commitment – promoting motivation, commitment and drive; (3) visions – developing visions of how the conditions might look in the future; and (4) action experiences – the benefits of taking concrete actions at school (Jensen & Schnack, 1997). Breiting and Mogensen (1999) later used three components to define action competence:

  (i) Knowledge of action possibilities;
 (ii) Confidence in own influence;
(iii) A wish to act.

Since the early reports, some authors have redefined the Action Competence Framework (e.g. Sass et al., 2020) and some have used Breiting and Mogensen (1999) original framework (e.g. Torsdottir et al. (2024)). For the purpose of this study, we have taken a more generalist approach and used "attitudes" to encompass the "confidence in one's own influence" and "willingness to act" aspects of the original framework from Breiting and Mogensen (1999) and "knowledge" from the original Jensen and Schnack (1997) knowledge component.

More recently, Olsson et al. (2020) define action competence as "a latent capacity among individuals to act sustainably". Although we find that definition productive for this study, we share concerns expressed about the overemphasis on individual actions or behavioural change as answers to the planetary crises and have considered collective and structural actions as an aspect of action competence in this study.

Action competence studies are predominantly focussed on the action competence of teenagers and youth, with teachers' responses used for triangulation purposes (e.g. Finnegan, 2023). However, studies of pre-service and in-service teachers are emerging. Schonstein and Budke (2024) studied secondary school geography teachers in Germany and found three types of teachers: those who do not see action competence as important, those who are overwhelmed and those who are highly motivated to teach action competence in education for sustainable development. Vidal and Kuckuck (2025) conducted a literature review to understand pre-service teachers' action competence in education for sustainable development and found 32 studies from 2007 to 2024, with a heavy skew towards quantitative studies. Our study addresses a less developed area – action competence of in-service teachers.

RESEARCH AIMS

In this study, we take a qualitative approach to understanding the change in knowledge, attitudes and behaviours influencing the "action competence" of pupils and teachers from four schools in Wales after running "*The Lifecycle of My Clothes*" Unit of Work. We assess this through the following research questions:

1. How have the pupils' knowledge, attitudes and behaviours towards clothing and the climate changed since running the UoW?
2. Have primary school teachers been empowered to teach CCE within the framework of the Curriculum for Wales by running the UoW?

METHODS

This study sought to understand changes in pupils' knowledge, attitudes and behaviours towards clothing and the climate as well as the extent to which the UoW had empowered teachers to teach CCE within the framework of the Curriculum for Wales.

Focus groups and interviews have been demonstrated as suitable methods for those aims. For example, Taber and Taylor (2009) studied the development in knowledge of primary school pupils through post-intervention interviews, while Trott (2019) explored children's growing awareness of climate change through focus groups. However, while most studies assessing the effectiveness of CCE conduct research directly with learners, this article reports on our engagement with teachers.

Ethical considerations

Ethics approval for data collection among both adult and child participants was granted by Swansea University on 7 October 2022 (reference 311022/533). Parents, carers and guardians of pupils involved received advance notification of the study via an information sheet distributed by the participating schools. Parents retained the right to withdraw their child and associated data from the study at any stage of the research. Participants were explicitly informed of their continuous right to withdraw at any stage, and full transparency was maintained regarding the study's expectations for both participants and their guardians to ensure ongoing assent.

Data collected was stored and processed in compliance with the General Data Protection Regulation and the Data Protection Act 2018. Permission was sought from teachers before audio recording of interviews began. Recordings were transcribed and saved with pseudonyms to keep data anonymous. Teachers' names and personal data were not transcribed.

Data collection

Schools were identified through researchers' networks and invited to participate in the project. Teachers from four primary schools in South Wales delivered the UoW in their institutions and then participated in semi-structured interviews and focus groups ($n = 17$). All participating teachers were white; 14 were female, 3 were male.

Three schools ran the UoW with all their pupils, from Reception to Year 6; a fourth school ran it with Year 4 and 5 learners only. Details are summarised in Table 1. Schools were small (126 to 180 pupils on roll) and were located in a spread of socioeconomic areas with a range of 8%–32% free school meals, compared to a Wales-wide average of 23%. The number of pupils with special educational needs ranged from 8% to 32%, against a Wales-wide average of 11.1%.

Due to the nature of semi-structured interviews, extra questions were asked if necessary. Participants were encouraged to be vocal, with the researcher asking follow-up questions and leaving pauses between questions. Spontaneous conversation was encouraged to gain insight into the participants' genuine views. This created 'emic' data that emerged in a natural way, with minimal imposition from the researcher (Stewart & Shamdasani, 2014). Emerging themes or unexpected findings from the emic data were explored during data collection, which ensured that the research captured a comprehensive and nuanced understanding of participants' perspectives. The researcher ensured each participant had opportunities to answer each question, as to mitigate Kelly's argument against group interviews (2003) and to get the most from each respondent. Specific information on the teachers' semi-structured

TABLE 1 Information on teachers' semi-structured interviews.

School	In person/online	*N* of participants	Year group(s) taught	Length (minutes)
1	In person	2	3, 2	17
1	In person	1	Reception	14
1	In person	4	4, 4, 6, 1	21
2	In person	5	Deputy Head, Reception/1, 2/3, 4/5, 6	35
3	In person	3	2, 3/4, 6	42
3	In person	1	4/5	27
4	Online	1	5/6	13

Note: In the UK reception children are aged 4–5, Year 1 5–6, Year 2 6–7, Year 3, 7–8, Year 4 8–9, Year 5 9–10 and Year 6 10–11.

interviews is in Table 1, and the interview questions are in Appendix A. Teachers reflected on the impact of the UoW on themselves and their teaching practices, and on the pupils' knowledge, attitudes and behaviours. Samples of pupils' work were provided to the research team by the teachers.

Data analysis

An inductive, reflexive thematic analysis approach (Braun & Clarke, 2006) was adopted to explore teachers' perceptions and experiences of climate change education (CCE) in the context of the new Curriculum for Wales. This bottom-up approach allowed themes to emerge directly from the data rather than being imposed through a pre-existing coding frame or theoretical model (Saunders et al., 2007). The focus was on understanding how participants' perceptions and practices changed, rather than testing a hypothesis.

Audio-recorded interviews were transcribed verbatim and checked for accuracy. After each interview, the researcher conducting the interviews made reflective notes capturing early impressions, patterns and moments of significance – these were shared with the research group. Each transcript was read five times to enable deep familiarisation with the content.

Initial coding was performed by a single researcher to ensure consistency. Codes were generated inductively, focusing on words, phrases and patterns that appeared consistently across the data. These codes were then clustered into overarching and sub-themes, using a constant comparison method to ensure internal consistency and clarity of meaning. While some of the resulting themes --such as knowledge, attitudes/behaviours and empowerment to teach CCE- aligned closely with the study's research questions, they were not predefined but rather emerged naturally from the data.

To enhance trustworthiness, two additional researchers independently reviewed the coded data and participated in collaborative analysis, where codes and emerging themes were discussed, refined and agreed upon among the research group. This process of reflexive dialogue helped mitigate individual bias and ensured that multiple perspectives were considered (Barrett et al., 2020; Coulston et al., 2025). The final thematic framework (Table 2) reflects the consensus of the research team and captures both the breadth and depth of teacher responses.

Changes in pupils' attitudes and behaviours emerged as a theme from the teacher interviews but were not corroborated through focus groups or interviews with pupils themselves. Following the interviews, teachers were invited to provide samples of pupils' work. The work was read three times by an individual researcher; the third reading took place after the thematic framework had been established.

TABLE 2 Themes and sub-themes developed from teacher interview data.

Theme	Illustrative quote	No. of times theme was mentioned (across all interviews)	No. of participants that mentioned the theme (out of 17 teacher participants)
Theme 1: Key Vocabulary	"They've still remembered what they mean by 'renewable', what they mean by 'biodegradable'." Y4/5 teacher, School 3	17	9
Theme 2: Change in Pupils' Attitudes and Behaviours		42	15
Increased Awareness of the Need for Sustainable Practices	"They are just more generally aware […]that the choices we make are far-reaching and clothes are one of those choices they make." Y4 Teacher, School 1	11	8
Hand-me-downs and Charity Shopping	"They're not ashamed to say, 'oh I've been to the charity shop'; […] before this [UoW] they wouldn't have said anything." Y6 Teacher, School 1	10	7
Initiating Activities	"We found that they wanted to re do it [testing materials] then back at home." Reception Teacher, School 1	5	4
Theme 3: Change in Teachers' Perceptions and Practices		44	15
Practices	"[the UoW]'s not only changed their attitude, it changed mine as well […] and just trying to incorporate more [CCE] into our topical activities as well." Y4/5 Teacher, School 3	14	12
Perceptions	"I didn't realise the impact of some of these choices and decisions[…] I think it was quite informative for us as staff." Y5/6 Teacher, School 1	30	15

During this final stage, the team engaged in reflexive dialogue, a collaborative process of examining how individuals' assumptions, values and positions might influence interpretation (Barrett et al., 2020). These discussions helped surface alternative perspectives and challenge implicit biases, ensuring a more balanced and credible analysis. Images of pupils' work that most clearly illustrated the key findings were then jointly selected by the research group for inclusion in the study. We defined "attitudes" in this study as a combination of the "confidence in one's influence" and "willingness to act" aspects of the Breiting and Mogensen (1999) Action Competence Framework. We defined "knowledge" as per Jensen and Schnack (1997); while content knowledge provision was an inherent component of the educational settings in which we operated, a focus on identifying possible solutions to the "problem" (i.e. fast fashion) prepared teachers and learners for developing knowledge of action possibilities.

FINDINGS AND DISCUSSION

This research paper aimed to evaluate the effectiveness of the new climate change education (CCE) programme on teachers and pupils by analysing focus group data gathered from teachers in response to the UoW. Table 2 summarises the key themes and sub-themes identified, including their frequency of mention by teachers. This section is organised by research theme; Table 3 shows the relationship between the research questions and themes that emerged from the data.

KEY VOCABULARY

Despite the interview questions not explicitly addressing the acquisition of key vocabulary by pupils, 53% of teachers mentioned that their learners had used keywords such as "biodegradable" and "sustainable" after working with the UoW. This was also observed in samples of pupils' work.

The results suggest a differential rate of acquisition of key vocabulary across the age groups engaged. For example, a Year 6 teacher expressed surprise at finding that some of his pupils were already familiar with the key vocabulary prior to the UoW. Year 4 and 5 teachers reported that their pupils had learnt the keywords and retained the information weeks later. In contrast, Year 2 and 3 teachers observed that, while most pupils understood the terminology by the end of the teaching period, long-term retention of key terms was deemed unlikely:

> They did understand lots of the terminology towards the end, but I think if you asked them now they probably would have forgotten.
>
> Y2 Teacher, School 2

Teachers who discussed key vocabulary across the three schools agreed on the importance of exposing all pupils to accurate terminology, including younger years and those with additional needs. This aligns with Bornstein and D'Agostino (1994) findings that younger children's processing of difficult vocabulary improves with increased exposure. A year 2/3 teacher said:

> We've always said that in science, use the correct terminology…I think vocabulary is a big aspect of science when you're teaching it to primary age children
>
> Y2/3 teacher, School 3

These teacher comments suggest the UoW has had a positive impact on pupil knowledge, and so does the correct use of technical vocabulary observed in the learners' schoolwork. In Figure 2, for example, the learner has correctly used the word "sustainable" in a letter written to the then Education Minister for Wales, Jeremy Miles.

TABLE 3 Relationship between research question and emergent themes.

| Research question	Themes that address question
RQ1. How have the pupils' knowledge, attitudes and behaviours towards clothing and the climate changed since running the UoW?	*Theme 1*: Key Vocabulary *Theme 2*: Change in Pupils' Attitudes and Behaviours
RQ2. Have primary school teachers been empowered to teach CCE within the framework of the new Curriculum for Wales by running the UoW?	*Theme 3*: Change in Teachers' Perceptions and Practices
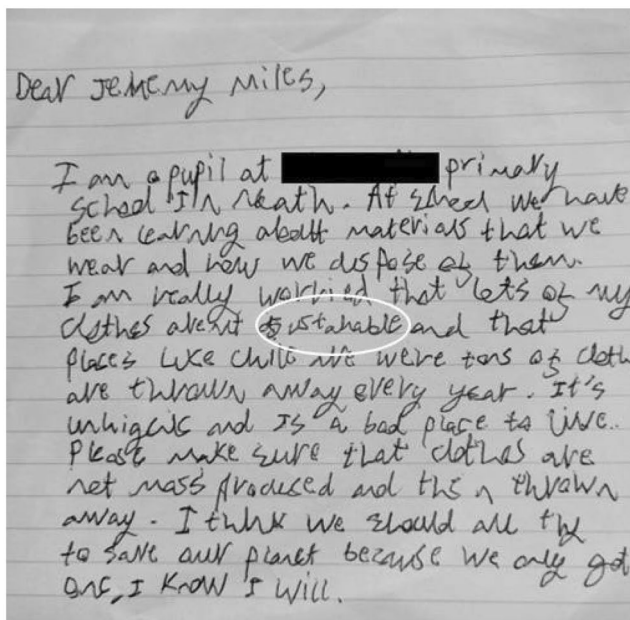
FIGURE 2 Pupil's work, school 4: persuasive letter writing activity.

CHANGE IN PUPILS' ATTITUDES AND BEHAVIOURS

The literature contends that education in the United Kingdom lacks pro-environmental ambition (Glackin & King, 2020; Greer et al., 2023; Martin et al., 2013). Whilst learning is mainly assessed through knowledge-based means (Graham, 2005), it has been argued that measuring knowledge alone is insufficient and that CCE needs to be action-oriented to facilitate learners' sustained engagement (Chawla & Cushing, 2007; Walsh & Cordero, 2019). Teachers are also calling for action-oriented CCE to be offered in primary schools (Howard-Jones et al., 2021). Therefore, analysing the changes in attitudes and behaviours influencing the "action competence" of primary school pupils towards clothing and the climate in response to the UoW provides a valuable measure of its effect.

Following the teaching of the UoW 88%, of teacher participants noted a positive change in pupils' attitudes and behaviours. Three key sub-themes emerged from the data (Figure 3); pupils' increased awareness of the need for sustainable practices, the de-stigmatisation of hand-me-down clothes and charity shopping, and pupils initiating climate-friendly activities in school and at home.

Increased awareness of the need for sustainable practices

Teachers reported that, subsequent to the UoW, pupils of all ages and abilities were more aware of the choices they made with regard to clothing and sustainability in general. One Year 6 teacher commented that pupils were more mindful about the lost property problem at their school:

> They do make comments about the clothing that they wear and we have a problem with lost property and there's always clothes left hanging around and I think now they sort of thought more about that and looking after it even more.
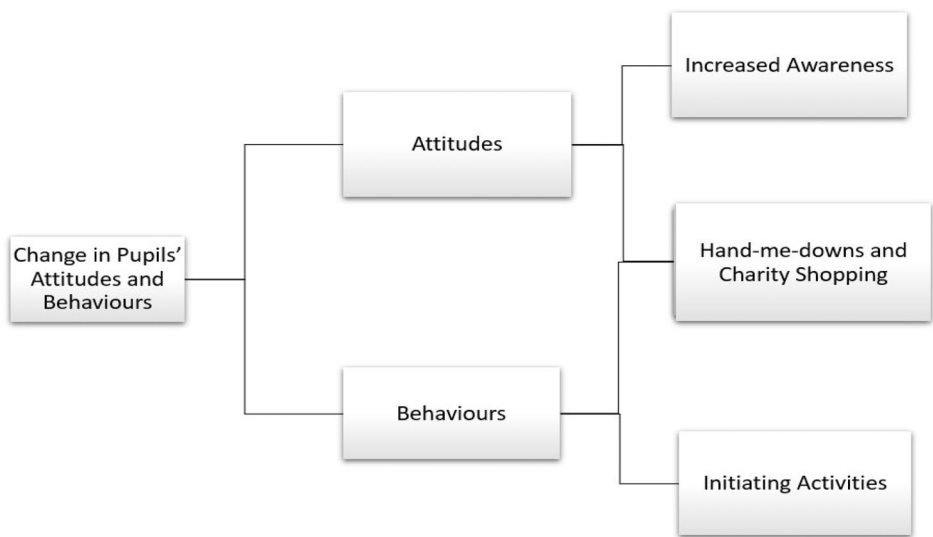>
> Y6 Teacher, School 3

FIGURE 3 The key sub-themes regarding pupils' attitudes and behaviours.

Whilst inspiring pupils to have environmentally friendly attitudes is a key aim when teaching CCE (Hosany et al., 2022), an environmentally friendly mindset does not necessarily lead to environmentally friendly actions, as Stern (2000) makes clear. Following completion of the UoW, children could identify potential action, but their increased awareness alone did not allow for the determination of whether those actions were implemented. Indeed, one teacher within this study noted the potential for social desirability bias as they questioned whether their pupils' visible change in attitudes was genuine, or whether they wanted to impress their teacher by saying what they believed was the 'right' thing.

Hand-me-downs and charity shopping

Following the teaching of the UoW, teachers observed that children were more openly discussing the sourcing of their clothes, whereas they had previously been ashamed to admit shopping at charity shops. This was particularly notable in the school with the highest number of children eligible for free school meals (32%). Teachers agreed that the UoW had "removed the stigma" attached to charity shopping.

One resource that seemed particularly valuable in the de-stigmatisation was the book *Sam's Clothes* (Ardoin et al., 2017), a custom-written fictional narrative developed specifically for the UoW. A Year 4 teacher noted that it successfully challenged the notion of shame associated with charity shopping and passed-down clothes.

> I think that was one of the things with the book Sam's Clothes, that it did actually introduce that idea of don't be ashamed with hand-me-downs and charity shop clothing and things. I think that was quite good in that respect, it was quite a good talking point.
>
> Y4 Teacher, School 1

Other teachers from the same school also noted that shopping in charity shops had been destigmatised following using the UoW.

> Few of mine have mentioned going to a charity shop with their parents and being so proud of it, I think because they've got that understanding that they are helping.
>
> Reception/Year 1 Teacher, School 1

At the end of *Sam's Clothes*, the protagonist feels proud rather than embarrassed by the pre-loved and mended clothing they wear.

Teachers' comments provide evidence that well-developed CCE teaching resources can make a difference to pupils' attitudes and potential behaviours, although long-term behaviour change was not measured as part of this study.

Initiating activities

Teachers reported that, following the UoW, pupils of all ages initiated climate-friendly activities in their schools. Reception pupils in one school asked to litter-pick around the school, and some took activities from the UoW and ran them at home with their parents. The teacher was visibly pleased and felt that the UoW helped their lesson planning and made their job easier.

> If they want to learn it, then that makes my life a little bit easier, because they are the ones who are eager to do it, and so it helps me give out lessons that they want to be taught.
>
> Reception Teacher, School 1

Older pupils took to upcycling, bringing items into school that they had either repaired or upcycled, as the following quote describes:

> Some of them are talking about patches to iron onto clothes if they've got holes and things, bit of a trend in the class now.
>
> Y4/5 Teacher, School 2

The Curriculum for Wales aimed for pupils to become 'ethical, informed citizens of Wales and the world' by implementing a learner-centred approach that prioritises pupil interests (Welsh Government, 2020). The teacher-reported pupil response to the UoW indicates that it piqued pupils' interests and motivated them to engage in activities beyond the classroom. This also aligns with Monroe et al. (2019) who argued that CCE is more effective when pupils have a personal connection to the topic and are actively engaged throughout the learning.

CHANGE IN TEACHERS' PERCEPTIONS AND PRACTICES

Given its principle-based approach, the Curriculum for Wales is heavily reliant on the capacity and capability of teachers (Evans, 2022). Considering that climate change and sustainability are integrated throughout (Welsh Government, 2020), it is fundamental that teachers are empowered to teach CCE (SCTC, 2022). Currently, there is a gap in teachers' understanding and confidence in the knowledge and skills essential for teaching CCE (University of Reading, n.d.; Monroe et al., 2013). That gave rise to our second research question, namely whether primary school teachers have been empowered to teach CCE within the framework of the new Curriculum for Wales by running the UoW. In answer to that, this section details the perceptions and practices that changed following teachers' delivery of the UoW.

After delivery of the scheme of work, teachers reported changes to their practices and perceptions around climate change and CCE. A number of sub-themes within practices and perceptions were identified and are summarised in Figure 4.

Practices

Teachers reported changes in their personal, teaching and whole-school practices. Following the teaching of the UoW, some teachers started a clothing swap between colleagues and took to mending their clothes rather than repurchasing items unnecessarily.

> Since doing this project I think it's made me think even more now, like I'm patching my clothes and I'm sewing my tights and socks and stuff now.
>
> Year 4/5 Teacher, School 2

This is significant, as literature shows a clear correlation between teachers' attitudes and their teaching practices, specifically in terms of CCE (Morrison, 2018; Nation & Feldman, 2021).

Teachers also highlighted that the UoW had impacted their teaching practices and how they viewed the Curriculum for Wales.

> For us, look at the new curriculum, I think it shows it's quite easy to do with just one small topic then. It's so broad, isn't it? Yes, that we can adapt for other topics then.
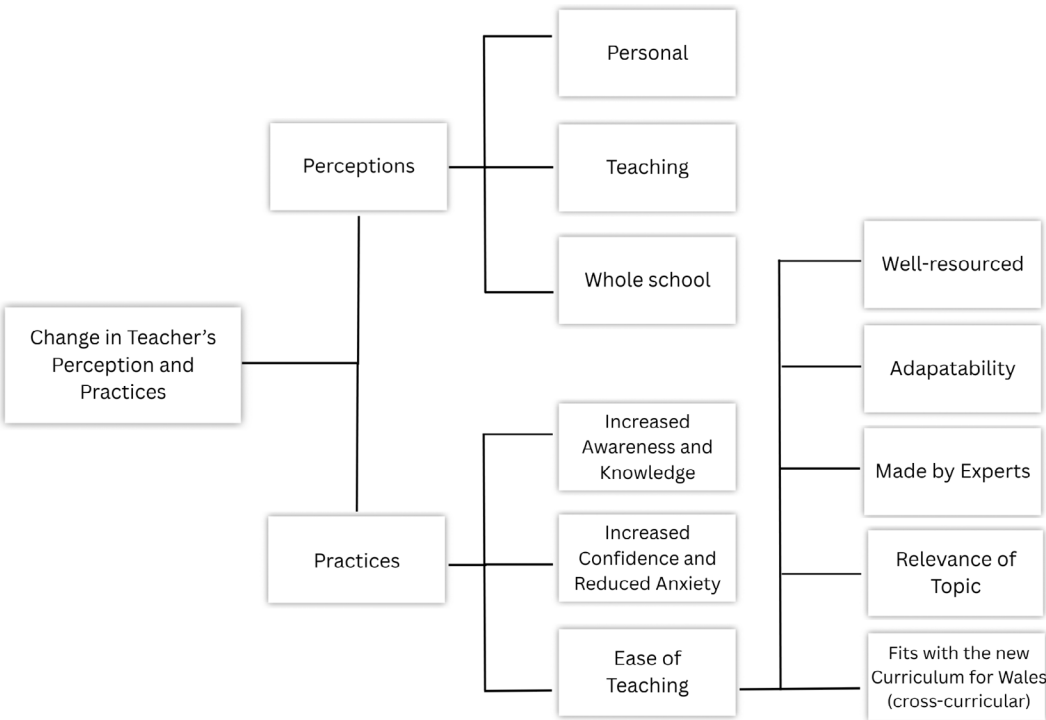>
> Year 2/3 Teacher, School 3

FIGURE 4   Sub-themes identified in teachers' changes in perceptions and practices.

Teachers also intended to use the UoW in the forthcoming years and said that it had inspired them to have recycling as a "regular hook" to incorporate into more of their activities. This fed into thinking about how whole-school practice could change, with discussions around how the UoW could be used regularly to develop knowledge and awareness in the younger children, without them getting bored of the topic. Teachers of younger learners were particularly interested in how a message taught early on could be reinforced higher up the school, as the following quote demonstrates:

> I think younger down, as long as they've got an awareness of it, then if we continue to do this every year, or every two years within our curriculum cycle, then it means then that is gonna be filtering through the school every year which means that they are always going to have some sort of understanding every year.
>
> Reception/Year 1 Teacher, School 2

It is important to note here that many of the positive comments came from teachers of older learners, for whom the UoW resources demonstrated greater suitability. Teachers in lower years were more likely to provide suggestions for additional activities that would appeal to their younger learners (see later). As in the quote above, teachers also noted that repetition over the years would support increasing familiarisation and understanding as the learners grew up.

Perceptions

Teachers reported the UoW had increased their understanding of why CCE is needed, and there was also an improvement in their knowledge and perceptions of pro-environmental actions. Results also show a significant increase in teachers' confidence to teach CCE and regarding personal actions they can take to reduce their impacts, which increase the likelihood of CCE content delivery and engagement in their classrooms (Bloom, 2021).

Teachers' confidence may have improved due to a reduction in anxiety around climate change and teaching CCE. A significant number of teachers expressed that they felt anxious about climate change, reflecting the feelings of many primary and secondary teachers (Hoath & Dave, 2022). However, participants agreed that they felt less anxious following what they had learnt from the UoW.

> I'm incredibly anxious about climate change…because it causes me anxiety. I tend to not read about it….Whereas I'm happy to learn about it… if you said to me 'If you did this that would really help the environment' I'd be like 'yeah that's great'… if you said to me 'Look there's a pack. That's what you need to know about to help', then I'd be like 'Ah brilliant'.
>
> Year 2/3, School 2

The results also show that empowerment to teach CCE is related to how easy the teachers find it to teach. Factors include how well-resourced the programme is as well as its adaptability, expert-led development, topical relevance and its cross-curricular approach, which demonstrated strong alignment with the Curriculum for Wales. Teachers expressed appreciation for the ease with which the UoW could be taught, citing its adaptability to accommodate the diverse learning needs of pupils at different levels, including learners with additional learning needs (ALN).

> Cross-curriculum fits in nice with the new curriculum and it's good for all the teachers to understand, because they don't all have the science background or the interest as well. So having everything laid out clear for them to see what the expectations are for each day then with the more detailed planning of things worked really well.
>
> <div align="right">Year 4/5, School 3</div>

Nonetheless, these views were primarily expressed by teachers from upper-year classes, whose pupils typically operate at higher academic levels compared to those in the Foundation to Year 2 stage.

An overarching view among participants was that they trusted the teaching materials due to them being developed by experts. This coincides with Bloom's finding that an increase in teaching CCE is heavily reliant on teachers having resources they can trust (2021). Teachers' views confirm that the trust elicited by expert-led development was a factor contributing to the empowerment to teach CCE, particularly for Welsh primary school teachers who have only had a mandate to teach CCE since September 2022 (Welsh Government, 2020) and therefore need access to reliable resources.

Other comments relating to the ease of teaching the resources included the personal relevance of the clothing topic for pupils and their high level of engagement with activities due to their personal relevance. This coincides with Monroe et al. (2019), who found that these two themes, personal relevance and ease of engagement, increase CCE programme success. Results indicate that the layout of the week's activities, showing their specific alignment to the Areas of Learning Experience, further empowered the teaching of CCE, as teachers from all subjects could understand it and felt confident that they were following the correct curriculum design.

DISCUSSION

This study considered the effect of a Unit of Work around clothing on pupils' behaviours, attitudes and knowledge of clothing and climate change, and teachers' sense of empowerment to teach the Curriculum for Wales. Teachers reported that pupils' knowledge of technical vocabulary such as "biodegradable" and "sustainable" increased and that pro-environmental attitudes emerged, with learners engaging in activities such as litter picks and upcycling their clothes even after the UoW was complete.

According to their teachers, learners could be said to have gained action competence as defined by Breiting and Mogensen (1999). Pupils became more aware of action possibilities (the UoW encouraged them to critically examine their individual and familiar consumption patterns and consider changes), became more confident in their own influence (evidenced through their production of persuasive letters advocating for action) and displayed a willingness to act (completing tasks such as upcycling, repeating school tasks at home). Additionally, some identified examples of action competence extended beyond the individual to incorporate collective initiatives, such as group advocacy or whole-class or school projects.

The field of climate change and sustainability education is moving towards integrating a climate justice aspect (e.g. Rushton et al., 2025). We incorporated aspects of climate justice into the teaching materials of the UoW as we drew attention to the clothes dumps in the Atacama Desert and the unfair practices of soiled clothes bundles being sold to Ghanaian markets. Although teachers did not explicitly comment on this in their feedback, the details cited in the advocacy letter to the then First Minister (Figure 2) reflect the impact resulting from the inclusion of those aspects (the relevant excerpt of the letter reads as follows: "I am really worried that lots of my clothes aren't sustainable and that places like Chile are w[h]ere tons of clothes are thrown away every year. It's unh[y]gienic and is a bad place to live").

A related, unexpected finding of the research was the destigmatisation of the wearing of second-hand clothes and the purchasing of clothing from charity shops, which was most frequently reported by teachers in the area of highest economic deprivation. However, in less economically deprived areas, teachers reported parental resistance regarding this topic, with parents not wanting their children to wear second-hand clothes and choosing to buy them new clothes instead. Since children's sustainable behaviour is a result of both parental and school support (Hosany et al., 2022; Martín-Ezpeleta et al., 2022), empowering teachers and children also requires engaging and collaborating with parents about the importance of CCE.

Teachers reported changes in their own perceptions and practices, therefore gaining action competence as a result of teaching the UoW. Findings indicate that teachers increased their knowledge of action possibilities and were willing to act; this was observed across two levels. On the one hand, the contents taught raised awareness of sustainable actions among practitioners as well as confidence that taking action will have an effect, motivating them to undertake sustainable practices. This was evidenced by their commenting on actions that they had taken on a personal level (e.g. mending their tights). At the same time, the ease with which they were able to teach the UoW (because they trusted the resources) increased practitioners' awareness of teaching content and practices around sustainable actions, as well as their confidence both in their capability to deliver this sort of teaching and in the effect it will have on learners. This was evidenced by their instigation of whole-school level initiatives such as setting up a uniform swap for pupils.

The reported changes in teachers and pupils were enabled by the flexibility afforded by the Curriculum for Wales, which offers teachers the opportunity to develop school curricula that address pupils' interests. The CfW also mandates the teaching of sustainability across the Areas of Learning Experience, thus offering further opportunities for teachers to teach CCE and align it with topics such as clothing. This study shows the opportunities of cross-curricular CCE, which could be useful for curriculum development outside of Wales, particularly as the focus for CCE typically remains siloed in science and geography lessons.

Notwithstanding the insights gained, the study was subject to some limitations. First was the geographical area in which it was conducted. Even though the teaching pack itself has had downloads in multiple countries, this research was limited to South Wales due to the geographical location of the researchers and their connections with local schools. Although we were able to capture a wide range of pupil economic backgrounds, learners were predominantly from white families in larger urban areas in Wales. Findings in schools where the children were from rural areas, predominantly non-white or from affluent backgrounds, may have been very different. In addition, teachers self-selected to participate in this study and therefore may have been interested in climate change education already. Future research could investigate whether the teaching materials can motivate teachers with no initial interest in CCE to explore sustainability, whether as a thread of the Curriculum for Wales or in other curricular contexts.

CONCLUSION

The topic of clothing offered an opportunity to explore consumption, identity and ethics in classroom settings, suggesting that everyday choices can hold powerful pedagogical potential. The correct use of terms such as "biodegradable" and "sustainable" by the pupils, as noted by over half of the participants, suggests that carefully designed, subject-embedded activities can support new vocabulary acquisition and conceptual understanding. Educators described pupils talking confidently about charity shopping, initiating school and home-based eco-activities, and expressing pride in mending or handing down clothing.

The findings have reinforced the value of contextualised, personally meaningful climate change and sustainability education and the opportunity afforded by the Curriculum for Wales to explore such topics. While these observations indicate growing environmental awareness, they remain provisional and are based on teacher perceptions rather than direct pupil voice or behavioural tracking.

Our findings extend calls in the literature for action-oriented, place-based CCE in primary settings (Chawla & Cushing, 2007; Howard-Jones et al., 2021), demonstrating how a familiar, relevant topic can catalyse both learner engagement and teacher empowerment. By focusing on clothing –a topic which receives limited attention in most environmental education research–, this study fills a noted gap and shows how early exposure to sustainability can normalise pro-environmental thinking (Bornstein & D'Agostino, 1994; Trott, 2019). Moreover, while recognising that systemic change cannot rely solely on individuals and requires collective commitment, considering pertinent knowledge and attitudes as highlighted in the Action Competence framework afforded this study valuable insight into how knowledge (including of action possibilities), confidence in one's own influence and willingness to act may shape sustainable behaviour in classroom settings.

Future studies should explore how the effects of CCE with a focus on clothing and fast fashion evolve over time. Studies could include direct pupil voice to further validate and understand the transformative potential of early years CCE, particularly regarding motivation and action-oriented changes in pupils' behaviours. Further work could also investigate the implications for inequity and perceptions of used and mended clothing that running the UoW could have in deprived areas across the UK.

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CONFLICT OF INTEREST STATEMENT
No potential conflicts of interest were reported by the authors.

DATA AVAILABILITY STATEMENT
Research data are not shared.

ETHICS STATEMENT
Institutional ethics approvals were obtained prior to the commencement of this study with application number 311022/533. All research participants consented to take part.

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Endnotes
[1] A network of pioneer schools across Wales was recruited by Welsh Government from 2016 to support the design of the Curriculum for Wales before its implementation in 2021.

[2] For more information on the Curriculum for Wales, see the special edition of *The Curriculum Journal* on this topic https://bera-journals.onlinelibrary.wiley.com/doi/10.1002/curj.41.

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APPENDIX A

Semi-Structured Interview Format
Recycling+ Teacher Feedback Questions

1. How did you find running the Recycling+ unit of work?
2. Did you run all of the activities? If not, what guided your selection?
3. What did you like about the unit of work?
4. Would you recommend any adjustments to the unit of work to make it easier for readers to use?
5. Would you recommend any adjustments to make it more accessible for learners?
6. To what extent has running the unit of work changed your perceptions of how you can act to help the planet?
7. To what extent has running the unit of work changed the pupils' perceptions of how they can act to help the planet?
8. Have you observed any behavioural or attitude changes in the pupils as a result of the unit of work?
9. Does know how your actions can help the planet make you feel less anxious about climate change?