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Article

"It makes me angry. REALLY angry": exploring emotional responses to climate change education

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Keywords: ethnography, climate change, emotion, education

- Consideration of emotional response to climate education in a primary classroom
- Exploration of emotions that teaching about climate change may raise for teacher, researcher and pupil
- Identification of gender and cultural bias in children's climate mitigation visions
- Use of three stage approach to climate education with emotion navigated, not ignored

Purpose: Climate change education and the emotional consequences this topic raises in the classroom has been largely ignored by researchers. This paper considers the emotional response to climate education in a primary classroom (age 9-10 years) in England and begins to explore the emotions that teaching about climate change may raise for both teacher, researcher and pupil.

Design: Part of a long- term ethnographic project in a school in England. Analysis of c60, 9-10-year olds drawings, participant observation notes and research diaries.

Limitations: This is a small study - further research with larger numbers, different ages and in different geographical regions are required with both pupils and teachers.

Practical implications: This work identifies pedagogies that allow injustices children identify to be explored with emotional responses being navigated rather than ignored. Such approaches support wellbeing in the face of growing numbers of young people suffering from eco-anxiety.

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1 THE CLIMATE EMERGENCY CONTEXT

The climate crisis represents the biggest problem facing the planet – posing a risk to human and non-human forms of life (Chomsky, 2019). The complexity of the issues has entangled social, economic and political threads thus increasing the anthropocentric risks of food insecurity, political instability, disease, poverty etc. (Peters and Vivekanananda, 2014). In this context there are growing numbers of young people experiencing what has been termed eco-anxiety (Marks et al. 2021) with a growing recognition that there is a need for innovative climate change education to support these learners (Dalelo 2011; Devine-Wright et al 2004; Kagwa and Selby 2012; Papadimitriou 2004). However, Rousell and Cutter-Mackenzie-Knowles (2019) suggest that climate change education remains under-theorised in relation to the more established fields of environmental education, education for sustainability and science education. There have been studies exploring the influence of mass media on student’s understanding of climate change (eg. Shepardson et al, 2012) and the ineffectual nature of scientific knowledge-based approaches on behaviour change (eg. Brownlee et al, 2013). However, how climate change education and the emotional consequences this topic raises in the classroom should be navigated has been largely ignored. This paper considers the emotional response to climate education in a primary classroom (age 9-10 years) in England and begins to explore the emotions that teaching about climate change may raise for both teacher (in this case teacher researcher) and pupil.

1.1 Climate education in England

The English education system has a National Curriculum (Department for Education, 2013) that neglects explicit reference to climate change before the age of 13 years old. However, young people under 13 are aware of the growing risks of a planet in crises and there are increasing concerns regarding the impact of this on their well-being (Whitehouse, 2018). Educationists and psychologists suggest promoting action (Ojala 2016 & 2013, Hicks 2018) as a positive way to reduce anxiety. However, the Department for Education recently published guidance which stated that teachers were not allowed to support anti-democratic activist groups such as those that facilitate climate change education (Department for Education, 2020).

Action does not have to come in a form of protest. Recent research by Howard-Jones et.al (2021) has highlighted how a majority of teachers in England recognize the importance of climate change education. Lee et al (2015) argues that this type of education is a necessity if we are to ensure public support and engagement with climate action. However, as Howard-Jones et al (2021) note, many teachers are fearful of inciting negative emotional consequences as a result of teaching such sensitive issues.

The focus of this paper is to reflect on the emotional responses to a climate change lesson. Fortus (2014) notes that, over the past 20 years there have been calls to include more studies about the relationship between emotional responses and science education

as emotions are embedded in both the learning and practice of science. In this context, emotions can provide a lens through which to consider the effect of understanding the science of climate change.

There has been considerable research that illustrates young people’s range of emotions about environmental issues, including the climate (for example Ojala, 2012a and 2012b, Swim et al, 2011). As the climate emergency proceeds, Gillespie (2020), notes that a new emotional landscape involving guilt, fear, helplessness, despair, mourning and trauma related to the climate is evolving. Mankad (2012) states that environmental decision-making demands emotionality as it promotes motivation for, and engagement with, complex issues. Hufnagel (2015) also puts great emphasis on this relation to emotion, arguing that without emotion we cannot understand whether or not a learner is engaged in either understanding or practices surrounding climate education.

Bryan (2020), notes that the role of emotions in teaching have been largely neglected in mainstream educational discourse. There have been few studies focusing on teachers’ emotions and preservice teachers’ emotion when teaching climate change (Hufnagel, 2015, Lombardi and Sinatra, 2013). With this in mind, our paper serves to build on work relating to the complex interaction between learners and teachers’ emotional landscape in response to climate change education and the challenges this poses. The questions we wish to explore in this paper are:

1. What are the emotional responses 9-10-year olds recognize with regard climate change and climate education?
2. How does an ethnographic approach add to our understanding of emotions when teaching climate education?

We will begin by reflecting on the challenges of engaging in emotional issues, before reflecting on why we used an ethnographic approach for this study. We will then recount the three-stage approach to the climate change education lesson we planned and led; unpack the discussion and engagement we had with young people in the classroom and focus on the emotions we and the pupils experienced.

1.2 What are emotions?

Keltner and Gross (1999) define emotions as being ‘relatively short-term biologically-based patterns of perception, experience, physiology, action and communication that occur in response to specific physical and social challenges and opportunities” (p468). They are, as Shields (2002) notes, urgent, personal responses relating to an individual’s well-being associated with an experience / event. Emotions have what Nussbaum (2001) refers to as ‘aboutness’ – they are enacted in response to something specific and can influence how a person considers themselves capable of change. This aboutness is important to our work as it provides an opportunity for us to think about which aspects

of climate change education elicit emotions for young people in school and how educators and researchers can support learners through the elicitation of these emotions.

Previous work on the emotional response to scientific learning has typically considered or prioritized positive emotions. There is an assumption that positivity indicates engagement, while more negative emotions inhibit engagement and learning (see for example, Broughton et al 2013, Tomas and Ritchie, 2011, Sadler and Zeidler, 2004). However, we argue that, by focussing on the positive, only a partial picture can emerge. We acknowledge that climate change produces a spectrum of negative responses.

O’Neill and Nicholson-Cole’s (2009) research focused on the impacts of fearful climate change messaging in the mass media. They found that while items that initiated fear and shock brought attention to an issue, they did nothing to motivate behaviour change in the 14-35-year-old participants. Since then, environmental psychology has explored the complex relationship between emotions and mechanisms to cope with climate change and decision making (Ojala, 2013, Reser and Swim 2011). In their global survey of 16-24 year olds, Marks et al (2021) note that 50% of young people are suffering with some form of eco-anxiety. 45 % of young people are negatively affected by their feelings to climate change on a daily basis. In our work as teacher educators, we also recognise that strong emotions are experienced by practitioners teaching such content. As such, we recognise that climate change education is challenging to the teacher and pupil alike.

1.3 Emotions, ethnography and education

As ethnographic researchers in education we recognise the multiple, interconnected and complex relations we have with and between people and places. Like Mills and Morton (2013), we see ethnography as offering the researcher and reader unique insights into educational worlds where institutional policies and individual experiences can be followed. We are researchers, teachers, teacher trainers, friends, parents to name a few of our roles. For the purpose of this paper we reflect on the classroom ethnography we have done at a single school with two classes of children (9-10 years) over a two-year period. Erickson (2010) notes that defining classroom ethnography is complex and a ridged definition can be unhelpful. They comment that the techniques used in classroom ethnography do not necessarily fit a set of techniques but a perspective where, unlike other ethnography, classroom ethnography is done by a teacher or person who has spent some time within the class and school.

While we spent two years working with the school, the focus of this paper is on a particular session that explicitly draws out emotional responses to climate change. The session came eight months into the project when relationships with staff and pupils had been established.

To ‘do’ ethnography relies on establishing a relationship with informants. We, like Fareen Parvez (2017), start from the premise that an emotional connection with those we work with allows richer understandings. Emotional expressions in this sense are not

observations that may add insight as an aside, but are the central focus of the moments we have in the classroom.

Recently, a number of ethnographic works have focussed on the emotions and vulnerabilities of the ethnographer (see for example, Behar 1996, Lerum 2001, Lumsden 2009, Drake and Harvey 2014, Hoang 2015). But what about the emotions of those we observe in this domain? Without doubt, the classroom is a space of emotion as pupils negotiate their way through the school day. The interplay of space, actors and the issues of the lesson converge in often unplanned and surprising ways to render a spectrum of emotion. From our experience as teachers and researchers we recognise this with regard climate change education and have drawn on the work of Fareen Parvez (2017) to help frame our observations.

Fareen Parvez (2017) suggests three domains of observing emotion: witnessing emotional expression, witnessing emotional vulnerability and establishing ties through emotional intimacy. To witness emotional expression can, for a teacher, be exciting and distressing in equal measure as the pupils gain confidence, understanding or grapple with difficult and complex issues and concepts. However, if this is observed from a distance and not disentangled through conversations and reflection, how emotion is managed goes unchecked. The second of Fareen Parvez’s (2017) domains overlaps with the first in that it refers to the observation of pain, anger or sadness due to the situation within which the teacher (researcher) finds themselves in. It is within these overlapping domains that this paper is situated: observing the emotional response children have to climate change education. The final domain is one in which a teacher(researcher) might establish ties with pupils due to these emotional responses - we will consider this in the later discussion.

In this paper we attempt to report on how we, as teacher researchers, purposefully planned activities for pupils to share their emotions about climate change and the climate crisis. This brings a focus on moments of revelation. Csordes (2007) notes that such moments allow the researcher (teacher) to experience intuition and empathy with the pupils and develop a deeper understanding of the moment – to which we consider understanding of emotion crucial.

2 METHODS

Previous to the lesson about climate change we had worked with the class on issues that related to this theme, for example fast fashion which, as an industry, contributes 10% of global carbon emissions. We were mindful of the emotional responses we could get from a session that directly asked pupils about their feelings regarding climate change. In our planning we did not want to communicate climate change information and then leave the children to grapple with their emotional responses to this information on their own. We hoped to facilitate a space for learners to talk about their responses to what they knew.

Our approach to lesson planning was informed by Hicks’ (2019) four stage framework for teaching about global crisis. Here, teachers facilitate:

1. the acquisition of appropriate knowledge of the issues
2. an exploration of young people’s feeling towards these issues
3. the identification of relevant choices for positive change
4. opportunities to engage in appropriate action for change.

We merged the four stages into three activities: an independent, 10-minute sketching activity so that pupils could communicate their understandings of what they understood by climate change – as pupils in the class referred to the ‘climate emergency’ we were led by this language and used this phrase interchangeably with climate change. The second activity explicitly asked pupils to share emotional responses in relation to climate change; and the final activity invited the group to sketch / write about their vision for the future. It was hoped that this final activity would end the session on a more positive note and facilitate discussion of mitigation and adaptation strategies rather than dwell on the negative. Our approaches to the study were approved by our university’s Ethics Committee and in line with BERA (2018) guidelines. We worked with two classes, 30 learners in each (n=60), in an urban school in England. The senior leadership team considered the school to be one where contemporary issues – including those pertaining to the environment and climate - were important to children’s learning.

We planned to deliver the climate change lesson with pupils eight months into the research. By this point we had developed an element of trust and familiarity between ourselves, the teachers and young people in the class. We did not plan to observe a lesson led by a teacher, but were instead facilitating a whole class session, with the teacher and teaching assistant present in the room. This would allow us to reflect on our own emotional responses to the activities. As such, we were active participants in the research (DeWalt and DeWalt, 2011).

In any research context there are power relations at work, but we hoped that by leading the session and working with the class in creative practices and dialogue we might be able to support participants in sharing their understandings and emotional responses to climate change. Group and partner discussion was encouraged within the classroom and students sat in groups of fours and sixes around tables for the session. In our research diaries we reflected on both the pupil’s and our own emotional responses to the lesson and how they informed the way in which we approached climate change education.

The data collection was informed by the Mosaic Approach (Clark and Moss, 2011). This demanded that we listen to young people by using a range of different tools that could be used to piece together children’s perceptions of climate change and the climate emergency. These tools included our research diaries with observational notes of conversation with children and children’s drawings. Due to the Covid pandemic we were unable to enlist the insights of young people in the interpretation stage of the analysis, but have since shared our findings with the groups involved, therefore adhering to the principles of the Mosaic Approach (Clarke and Moss, 2011).

Following Marks et al (2021), we did not wish to increase potential eco-anxiety by presenting the younger generation as the group who would be able to ‘fix’ all of the problems alone. We introduced our session by talking to the class about our desire to know more about what young people understood by climate change – we positioned the young people as experts in their own knowledge systems and important agents for change within a wider community. We began by asking young people to make an independent, free response drawing and annotate what their understanding of climate change and the climate crises was. This activity lasted c.10 minutes and all pictures were anonymized using a series of numbers and letters (indicating the participant and class). Individuals considered the aboutness of the emotional response – the important or emotionally significant topics of the climate crises (as informed by methods used by Hufnagell 2015). These images offered potential insights into children’s relationships to the world (Farokhi and Hashemi, 2011) without the pressure of linguistic confidence. Boden et al. (2018, pp218) note that, “visual methods seem to disrupt participants’ rehearsed narratives allowing multiplicity to surface more readily”. Our aim was to use pupil centred techniques of data collection which we hoped would allow non-threatening insight into thinking. We adapted Clark and Moss’s (2011) method of learning walks with children. Whilst learners were drawing at their desks, we walked round the room, asking questions and discussing drawings in order to clarify meaning. These were later written up in our research diaries and assisted us in making sense of the images when further analysis was undertaken after the session. We hoped that supporting pupils in the process of openly acknowledging the emotional (and often strange and uncomfortable) reaction to climate change would allow them to find this more of an everyday and accepted part of a school session. It was by engaging in this process that we hoped to develop a better understand of the children’s emotional responses to climate change and the climate emergency.

We followed the initial drawing activity with a group discussion about emotional responses to climate change. On the whiteboard at the front of the class we presented a horizontal line. This depicted a spectrum from very positive to very negative. We asked the children, where on the spectrum are you in reaction to four sentences: I feel nervous about climate change. I feel worried about climate change. I feel angry about climate change and I feel restless about climate change. Each child was given a sticker with their personal number on which they positioned on the spectrum with regard each question. These stickers allowed not only a visual indication of how the group felt (which was photographed to reflect on later), but also offered a way of discussing both individual and group emotions. These visuals and discussions were essential for deepening our understanding of what was going on in the classroom for both the pupils and for us as teacher researchers.

For the final activity in the session we asked pupils to draw someone they felt would be able to help mitigate the problems of climate change in the future. Finishing with this activity we hoped would facilitate a more hopeful and positive end to the session.

However, we were mindful that climate change education can be a highly sensitive issue in a classroom. In order to neutralize the atmosphere before the class were dismissed for their lunch break a ‘fun’ activity, with no relation to the theme was introduced. We decided to watch funny videos of cats for a few minutes. This was a very successful strategy and the whole group obviously enjoyed the clips, wanting to see more of them rather than leave for their break.

3 ANALYSIS

Data collected consisted of our research diaries, photos and children’s drawings. As we analysed our research diaries and photos we drew upon our immersion in the classroom to reflect on contextual clues in what was said and drawn that signaled emotional responses to the issue of climate change. We were also careful to note our responses to the emotions that were shared.

In the first activity, drawings were used to reflect on what children thought about climate change and the climate crisis. Dimitrijevic et al. (2016) note that there is no well-accepted technique to use when analysing children’s drawings. We chose interpretive coding techniques which were supported by thematic analysis of annotations. We both independently looked at the drawings and made initial notes; drawing out themes. We then came together to discuss these and identify commonalities.

The second of the activities invited children to position themselves along an emotional continuum in response to particular words relating to how they felt about climate change and the climate emergency. Further themes were identified through this process and immersion in the data which enabled us to gain a better understanding of how the children felt.

The final activity in our three-stage session with young people returned to a drawing activity. This time, not based on knowledge, but hope for the future. Drawings, as in the first activity, were analysed by each of us in turn and then together.

By examining the aboutness of the elicited emotions connected to climate change in the three activities we identified four categories: impacts, causes, severity and acting to mitigate climate change (see Table 1).

Table 1: Identified categories of aboutness

Aboutness Category	Description of the Category
Impacts	Who or what is being impacted Where the impacts occur
Causes	Who or what is causing climate change
Severity	The severity of the climate change
Taking action	Who or what should take action to address or stop climate change

As teacher researchers we also reflected on our own emotions. We talked together about how the session had affected us and the emotions that the activities, and children’s responses to these activities facilitated. These reflections were then noted in our individual reflective diaries which we shared during the analysis process.

3.1 Activity 1: What is climate change and the climate crisis?

From the annotated drawings and conversations during the first activity, children were asked to reflect on ‘what is the climate change and the climate crises?’ Though we knew and were prepared for the focus of this work to be on exploring emotion, we both noted in our conversations and diaries how uncomfortable we felt about potentially upsetting children. As noted in the diaries:

> “I know the plan is to get children talking about climate change, that’s the focus of this project. However, hearing that emotion articulated in the children’s own words really brought home how we, as teachers, need to do this more. The children seemed both excited and relieved that they could share their concerns.” (Diary 1)

> “Uncomfortable, raw – I know this is part of the process of climate education but it’s not one I really enjoy. Part of me wants to protect these children from the scary world, but seeing how articulate they were at communicating what they thought and why was a relief. We need space in classrooms for this.” (Diary 2)

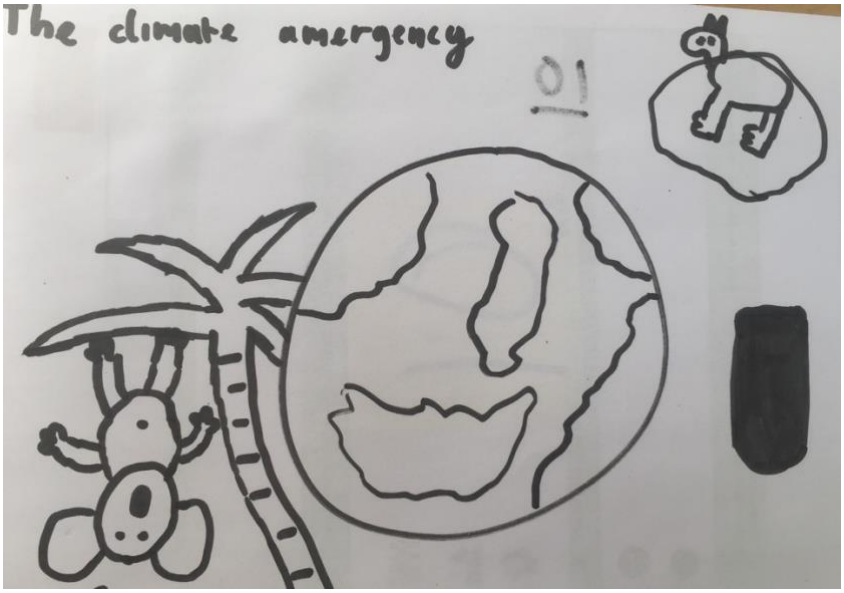
Four reoccurring themes became apparent from the drawings all of which were related to impacts, causes and severity: the melting of icebergs; the burning of fossil fuels from factories, ocean plastic and the Australian forest fires which were being reported in the media at the time (see Table 2). A further theme of deforestation was noted by one single child which we feel worthy of note and will also comment on below.

Table 2: Identified themes from drawings of activity 1 and associated words used by children in drawings

Themes in children’s pictures and annotations	Linked vocabulary
Melting icebergs	Sad, dying, endangered, sea level rise, drown, losing their home, polar bears, penguins
Burning of fossil fuels	Factories, air, pollution, fossil fuels, smoke, carbon dioxide, asthma, ill, choke
Ocean plastic	Chocked, die, fish, seals, whales, turtles, jelly fish, swallow, kills, wraps around, everywhere, arctic
Forest Fires in Australia	Koalas, kangaroos, burning, dying, burnt to a cinder

While it is not possible to include all drawings here, below are examples within which each of the categories can be identified along with the associated extracts from our diaries.

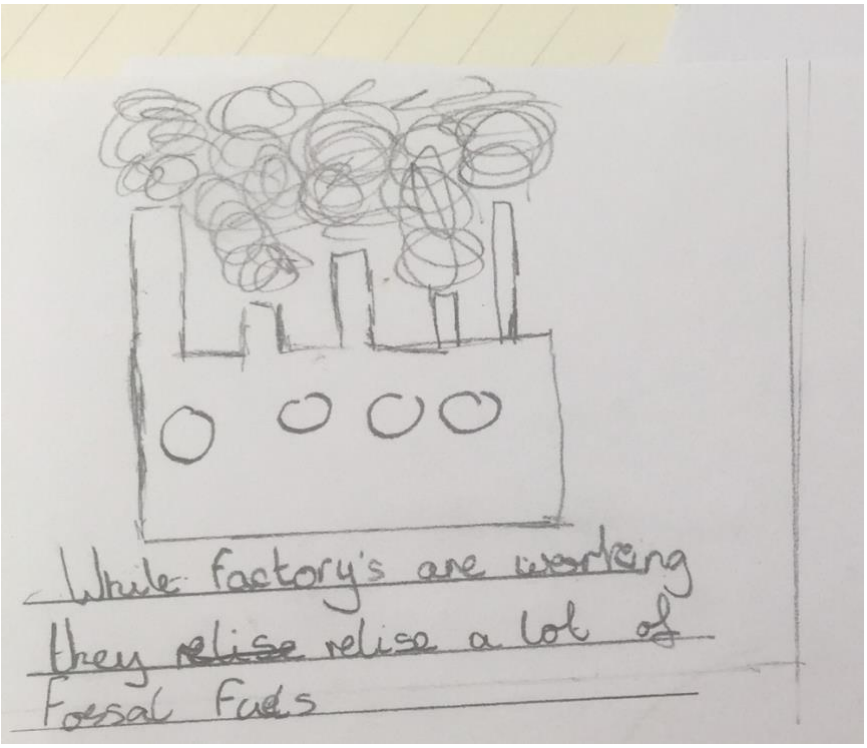
Figure 1: Child’s drawing of the climate crisis



10a identified the climate crisis as an ‘emergency’ that was impacting on the whole world. They were using words like ‘terrible’, ‘awful’ when they spoke and seemed frustrated by what was happening, especially with regard the two issues which were most pertinent to them: the impact of melting ice caps on polar bears (as seen in the top right), and the current forest fires taking place in Australia. Many young people were talking about how they had seen many koala bears losing their homes and being rescued on the television. They had seen these images both at home and in school during their ‘news time’ after lunch when they streamed the children’s news service ‘Newsround’. It was interesting to talk to 10a about their concern for this impact – it was very much for the koala - the cute fluffy animal who would clasp to a human and be fed through a baby’s bottle to rehydrate them. There was no concern for the loss of tress, plants, insects or other non-human species. There was no concern for the humans who had lost their lives and homes. There was no concern for the impact the fires, and what the release of stored carbon into the atmosphere would have. The koala and polar bear produced an emotional response. 10a saw only animals in danger that can’t help themselves and felt pity, guilt and sadness.

As we walked round the tables it was becoming obvious that the children were having an emotional response to thinking about climate change. The words they used were negative and included climate change being ‘horrible’, ‘awful’, ‘terrible’.

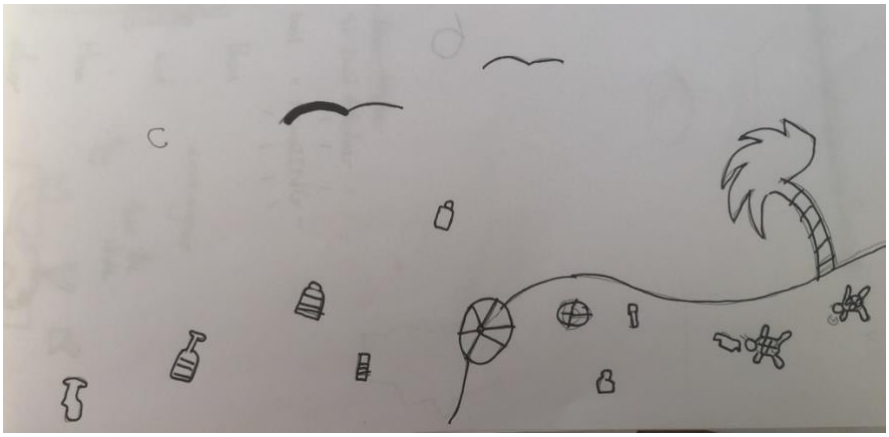
Figure 2: Child’s drawing of factories as a contributor to climate change



27b identified that the climate crisis was due to the burning of fossil fuels in the manufacturing of goods. While there is some misunderstanding here – factories releasing fossil fuels, rather than releasing carbon dioxide and other pollutants – the association with climate change and industrialisation is clear. Here is a cause, rather than a consequence of the climate emergency. It became clear through conversations with 27b and walking round the room talking to others that there were misconceptions relating to the scientific processes of climate change, even in a simplified form. Children were having an emotional response to the consequences of a process that they did not (fully) understand. There were simple causal connections being made such as: Greenhouse effect = icecaps melting = **all** polar bears losing their homes and **all** the people on Earth drowning. This cataclysmic view was causing anxiety for the children, none of whom recognised that this vision of the future was not one predicted by scientists.

Ocean plastic was a reoccurring theme in many of the pictures, as can be seen in the work of 6a. In this drawing there is plastic debris scattered through the sea with a turtle looking to imminently swallow a plastic bag. While there is a tree in the picture, this seems to be used as a landscape feature rather than as a point for discussion. The important work that plants (including trees) have in the mitigation of climate change was not mentioned.

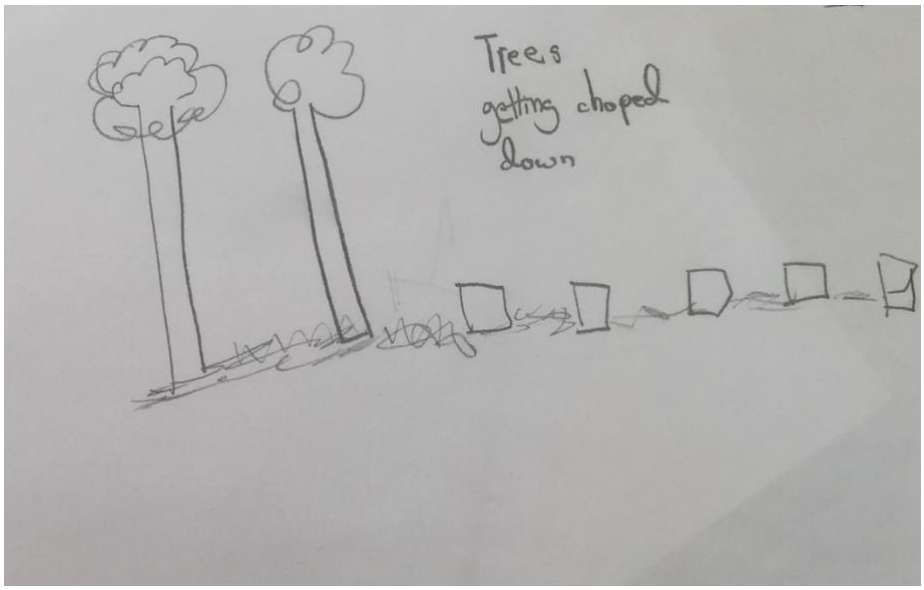
Figure 3: Child’s drawing of ocean plastic as an impact of people on the planet



The images young people created all showed some understanding of the processes and impacts of human action on the planet, but did not dwell on a personal response to climate change. What was interesting was that in both sessions, all learners seemed to expect both of us to agree with their emotional responses. They at no point seemed to hide their feelings or feel it was inappropriate to feel sadness, fear or guilt at what was happening. We noted in our diaries how we, as the teacher researcher were interpreting these responses:

> ‘Children seem to be more capable of dealing with difficult issues and handle their emotions than we expected.’ (Diary 1).

Figure 4: Child’s drawing of deforestation



Participant 3b presented an image of felled trees. We have included this image because it was the only image from the whole data set which focussed on plants alone. Plants are incredibly important to mitigating the climate emergency. They are rain makers and earth

coolants, food resources and support the lives of all other living creatures. This importance was not the reason for the focus on trees in this image. 3b’s concern was not for the trees, but for the lack of paper this felling would lead to. They saw a correlation between lack of trees and reduced resources for humans.

All themes from the drawings were explicitly linked with the loss of animal species and habitat due to a combination of rising temperatures, rising water levels and rising levels of pollution. It was only one drawing and during discussion with two pupils that any direct reference was made to plant agency in the climate crisis. We were told that, ‘trees are being cut down’, the purpose for which was to supply either ‘fuel for factories’ or to use the trees to ‘make paper’. This deforestation was seen as a problem as it was the cause of loss of habitat for animals. What we refer to as *botanical agency*, that is a plant having agency for and of its own right, was not considered by anyone in the activity.

3.2 Activity 2: How do you feel?

Once the first drawings were completed, we talked to the group about wanting to explore how they felt about climate change. This time we were shifting from knowledge about process and impact and began to identify specific emotional responses to climate change.

The first response showed that a majority of the group were feeling nervous and worried about climate change. We asked them what they were worried about. Children responded by saying it was “the polar bears”, “rising sea levels”, “the end of the Earth” that gave them most concern. There was a certain sense of doom. We were aware that this activity had changed the feeling in the room to a more negative one. As teachers we didn’t want to prolong these feelings so we quickly moved on.

> “Directly asking how the children felt was different from finding out about their feelings through an activity as we did in the first part of the session. Faced with the raw emotions felt uncomfortable. We were aware we needed to balance wanting to facilitate the discussion of emotions without inciting further anxiety.” (Diary 2)

The class were then asked: do you feel angry about climate change the climate emergency. Anger does not tend to be an emotion very often encouraged to be displayed within a primary classroom. However, when we invited the group to think about anger, the group all indicated with their numbers that they felt angry. Some participants moved their paper off the scale to indicate how strongly they felt. To reinforce this, 13a commented: “It makes me angry, REALLY angry”. We asked why or who the children were angry at. All children responded by saying ‘adults’ or ‘grownups’ with many comments echoing 11b when they said “the adults just haven’t done enough, they have let us, the planet, everything, down”. This put us in a difficult position. We shifted from being the participant teacher researcher, to a member of a group who the children were angry with and identified as having let them down. In the first drawing activity the children seemed to accept that we would have the same opinions as them. However, in this activity,

this was not the case. Children became accusatory towards us, we were the grownups that had let them down. Both of us talked about our sense of guilt afterwards.

> “It seemed our position had shifted and as experienced teachers we recognised we had choices to make; we could take the ‘it’s really difficult and we’re doing our best’ position – which would further develop an ‘us’ and ‘them’ dichotomy; talk about what we do personally to mitigate the issues and present ourselves as one of the goodies / environmental activists; or play devil’s advocate and see what response it got. But, would this stance incite greater anger and to what purpose would that be? In the end it seemed to us that agreeing with the group was an appropriate reaction. By doing so, we acknowledged their anger, our position and recognised as teachers that we did not wish for their anger to grow further. It seemed we were protecting both ourselves and the group from further heightened emotional encounter.” (Diary 1)

We continued with the session and moved to the final screen where we asked the group how restless they felt along the spectrum. We explained that by restless we meant, how ready for action were they.

> “I was so relieved that a majority of the young people felt they could take action for positive change. Only one person felt there was no point and positioned themselves off the scale. Here again we were very aware of the emotions running in the classroom. There were tuts of disgust at the individual’s placement of this lack of positivity and calls of ‘No!’ followed by shocked expressions.” (Diary 1)

This session saw a 9-year-old openly articulating how helpless they felt within the context of climate change. They felt they had no agency and there was no point in taking action. As teacher researchers responding to this reaction we felt a mixture of disappointment and guilt at being an adult. We also recognised that as a teacher researcher, we were expected to facilitate a safe place for children to share their views (as stipulated in the Teacher’s Standards (Department of Education, 2012). Having peers jeering at a negative response that was congruent to others had to be addressed in the moment.

We encouraged everyone to listen to each other’s opinions and have space to discuss their views. The group were open to this, and the individual who had indicated a sense of helplessness had the confidence to stand up for their position. They referred to what they had heard at home and on the news. They referred to the images of the Australian wildfires and polar bears loosing their homes they had seen. They looked at us and their peers and asked: ‘how can we possibly make it right?’ This provided a timely segue into the final activity.

3.3 Activity 3: who or what is going to help us?

The final activity in the session asked the group to consider who or what they felt would be able to make positive change for the future. Once again, all participants were asked to make a drawing. Here, ‘taking action’ was the focus and through the process of coding drawings, six main themes became evident: Greta Thunberg, tools to support environmental action, artificial intelligence, super hero, change through group action and the representations of angelic forms.

Whilst not wanting to give too much weight to the frequency of each code, the quantitative comparison of the codes in Table 3 shows that some themes clearly stood out in the drawings. Of particular frequency were references to Greta Thunberg, the creation of robots and the use of tools to help clean up the planet.

> “While I know that Greta [Thunberg] visited the UK I was really surprised as to the impact she had on these young people. They were all talking about her in hugely positive ways – here was a hero for 9- and 10-year olds.” (Diary 2)

Table 3: Codes derived from the qualitative analysis of young people’s drawings of their climate hero

Code:	Pictured objects	Number
Greta Thunberg	Young white, female with long hair. Wearing a yellow coat	25
Eco tools	Nets, animal first aid kits, litter picking apparatus	14
Artificial Intelligence and the Role of Technology	Robots	9
Super hero	Cape, face mask, super power	6
Multiple heroes	Identifying more than one person needed for heroic action	4
Angelic	Angel wings	2

These codes reveal the main themes identified in the inductive coding of n=60 drawings. In what follows we once again present a selection of drawings that represent each code in turn and embed notes from our diaries that help to contextualize this analysis. In the drawings, the children explore potential solutions to climate change

and the climate crisis. Throughout the session, children were excited and engaged in the activity. The atmosphere was very different from activity two. The groups were transformed from talking about their anger and helplessness to more solution focussed and hopeful futures.

> “It was great to see how children saw their own personal responsibility about climate change and the crisis not being put on their shoulders alone. There was a feeling of empowerment and shared responsibility throughout.” (Diary 1)

3.4 Greta Thunberg

In 25 drawings, explicit reference was made to images who were recognizable as Greta Thunberg – young, white female with long hair, sometimes in braids, sometimes with a speech bubble quoting some of her famous speeches. Unlike drawings of future facing technological innovations (as seen in image 7, here the images are relating to a real, contemporary individual; a familiar figure who young people associate with. Many of the depictions of Thunberg incorporated reference to her speeches and image 8 relates to the now famous ‘How dare you’ speech that she made to UN officials at the 2019 Climate Summit. Here, her anger at the authorities and their lack of action to combat the consequences of climate change were made clear through 8a’s drawing. Children commented that her anger was ‘real’ and was ‘making a difference’. They felt that she reflected and voiced their concerns as young people. While Greta was not called a ‘superhero’ she was referred to in terms indicative of such with children commenting ‘she’s amazing’, ‘she’s incredible’, ‘she’s awesome’, ‘she will save the planet’.

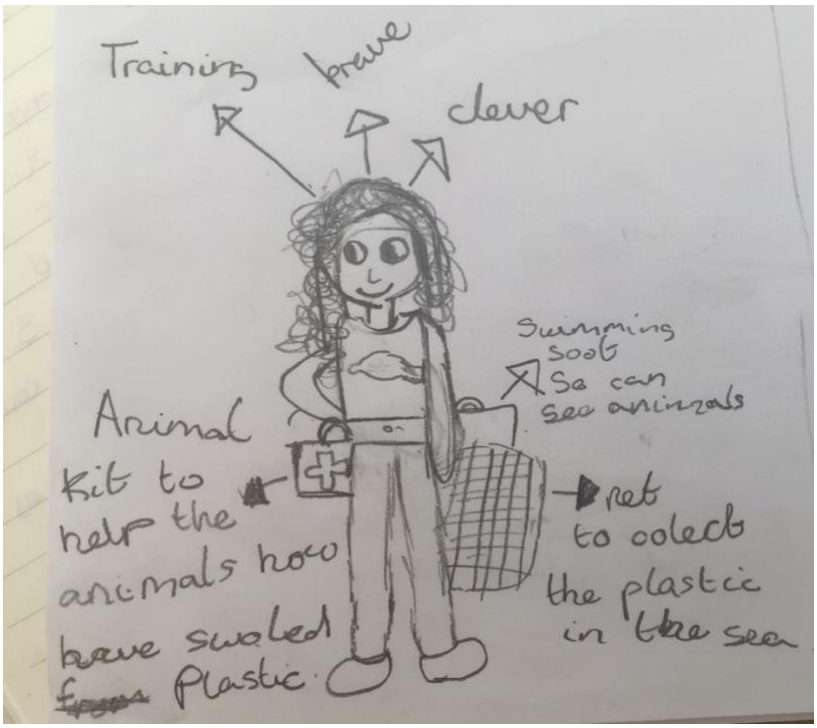
Figure 5: Child’s drawing depicting Greta Thunberg

3.5 Eco tools

14 drawings saw the presence of tools and equipment to help individuals make a difference to climate change. These tools served the same purposes as those that were being performed by the robots (see below), namely collecting ocean plastic and waste. Some of the robotic devices had seed planting facilities. Here, in this final activity, we find that children recognize the importance of trees. A number of pupils talked about how trees ‘give us oxygen’ – though no reference to trees as rain makers, climate monitors, food resources etc. was made. While the importance of plants may not cover a wide understanding, we found this particularly interesting, especially as there were so few references being made to botanical agency in the first activity. It seems that while trees and plants were not necessarily seen as a priority in understanding climate change, they had importance to the children when considering the future.

One of the main themes in activity 1 was the place of animals in the climate emergency. Here, depictions of people with tools that enabled caring for animals were seen. In these drawings it is not scientists and engineers who are depicted as the developers of solutions, but everyday individuals – individuals who feel they have agency enough to make a difference.

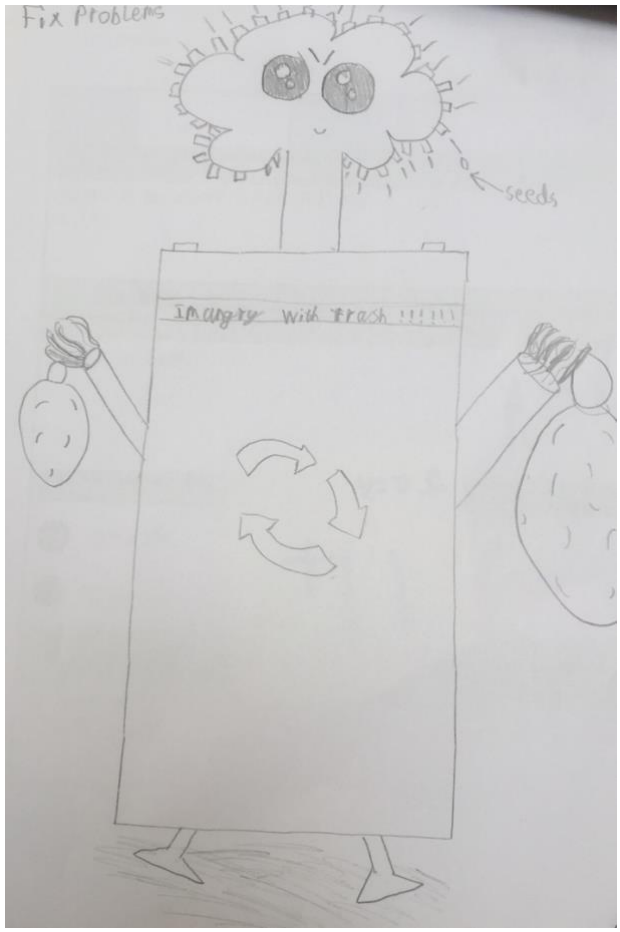
Figure 6: Child’s drawing showing eco tools



3.6 Artificial intelligence

Nine drawings depicted robots that were created to fulfil various functions relating to improving the environment. These included being able to plant trees, pick up litter, dissolve ocean plastics and recycle waste.

Figure 7: Child’s drawing of artificial intelligence



> “It seems that the group have an understanding the physical consequences of some human impacts on the planet – including deforestation, and plastic pollution. However, there was no reference made to any social inequalities that have resulted from climate change (for example living with extreme weather, food poverty and poor working conditions to supply the global north with material goods).” (Diary 1)

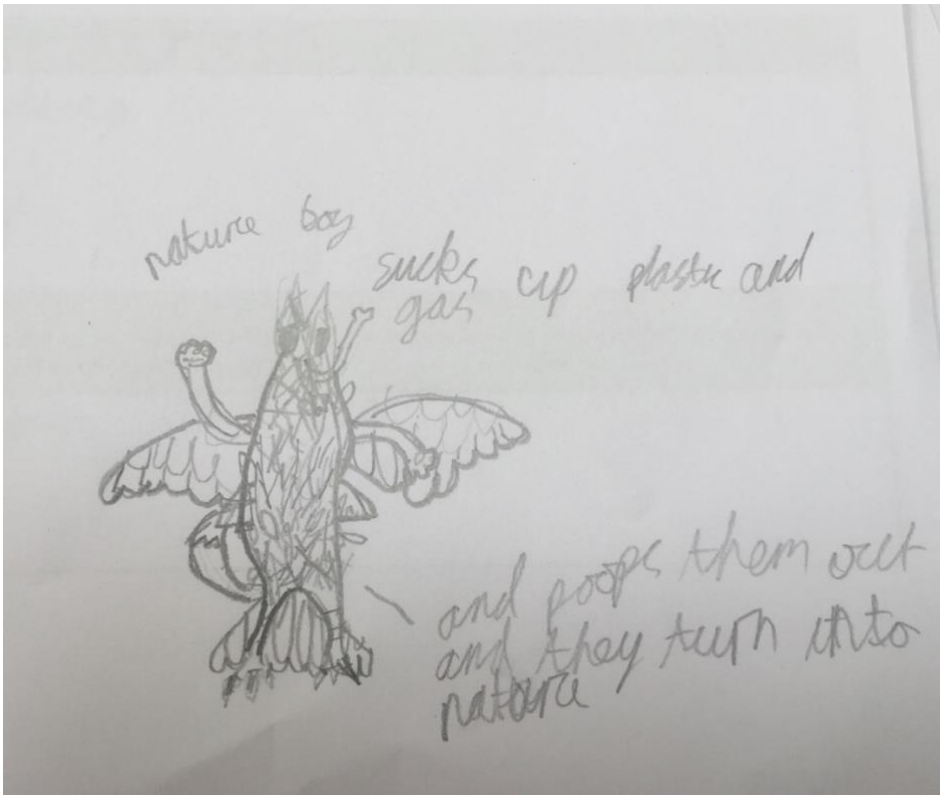
We were somewhat surprised at these omissions as previous sessions with the group had been focused on fast fashion and the socio-economic and environmental consequences of this industry. Linked learning and understandings were not being made. It also indicates that these children have an expectation that science and engineering industries will be able to develop creative solutions to the problems we face in the climate

emergency. Whilst drawing, 5b talked to us about how the robot was ‘angry with trash’ and the people who dumped rubbish and rubbish in the sea. They said that robots would be able to ‘fix the problems we [people] have made’ and that they were really excited at that prospect.

It should also be noted that in all but two drawings from across the sessions the young climate activists were referred to with female pronouns (she/her). Only two depictions (in the form of superheroes with capes) were referred to as he/him. All depictions of people were young, white individuals.

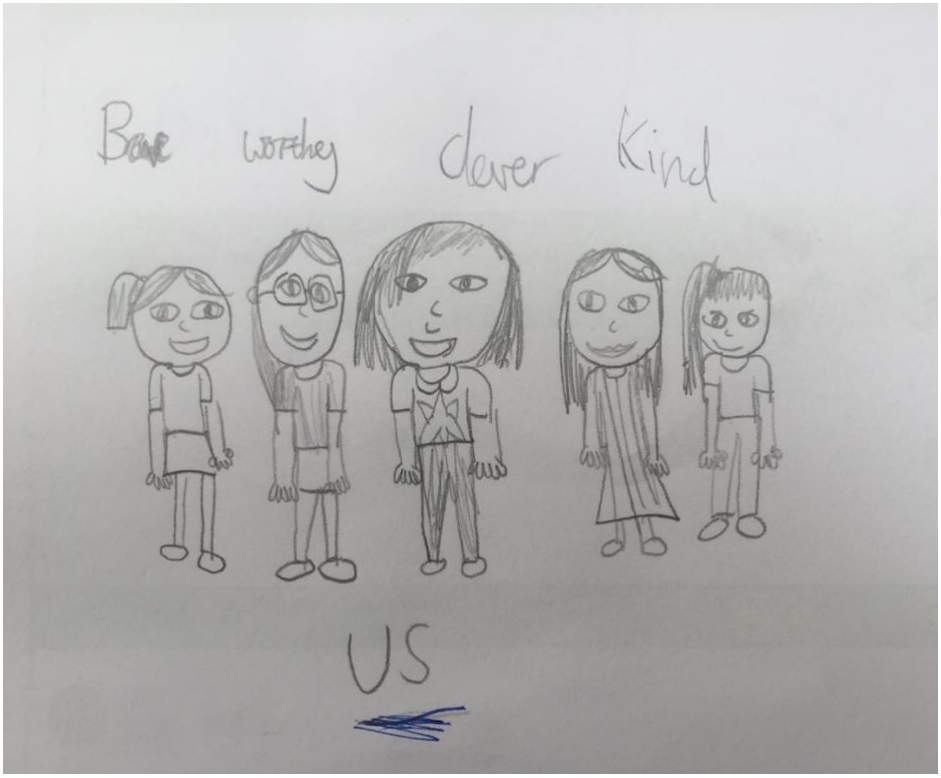
3.7 Superheroes

Figure 8: Child’s drawing of a superhero in the form of ‘Nature Boy’



Of the six individual superheroes that were depicted as future combatants of the climate emergency, four were presented in recognizable human form. These had some commonalities to the representation of superheroes in children’s media. That is to say, they were drawn with a cape and mask. The remaining heroes took on a variety of shapes, with elements of animals mixed together. For example, heroes were depicted with both a trunk and wings. This may indicate that young people are accepting a split between ‘nature’ and ‘humans’ – humans being apart from nature. In this interpretation it seems that it is ‘nature’ that will be able to undo and repair human actions. It may also indicate that, like the angelic forms below, help will come from outside of this world.

Figure 9: Child’s drawing that depicts community of action



3.8 Multiple heroes

Four young people represented a group of people as the way climate change would be mitigated – working together towards shared community action. Instead of an individual character, drawings depicted groups – recognizing the need for ‘ordinary’ people to work together in order to combat the climate crises. All groups of people were depicted as females, all were smiling and looking happy to be part of the solution. The participant who drew image 8 told us how ‘we’re’ part of the solution – pointing to everyone in the classroom and underlining the word ‘us’ on their picture. No depictions included people with a visible disability apart from the wearing of spectacles. However, it should be noted that Greta Thunberg has been diagnosed with Asperger’s syndrome and it is not clear whether young people embedded this non-visible difference into their drawings.

3.9 Angels

Two drawings showed angelic forms. These drawings depicted young females with magnificent wings, in flight and smiling. This may denote young people as seeing solutions to climate change resting with a higher power, out of their and other worldly people’s control. The children who drew these depictions were positive about the future. They had faith that climate change would be overcome. No longer were they talking of anger and helplessness as in the previous activity, but hope and happiness in the face of creating change.

Figure 10: Child’s drawing of a climate hero in angelic form

4 DISCUSSION

For the purpose of the discussion we will return to our two research questions.

4.1 What are the emotional responses of 9-10-year olds to climate education and how can teachers navigate these emotions in the classroom?

This research has demonstrated that children who took part in the planned climate education lessons experienced a spectrum of emotions. For a majority of individuals these emotions altered as we worked through the three activities. Activity one and two saw many usually considered negative emotions being displayed and talked about by young people - such as anger, sadness and helplessness. As teacher researchers we also had to navigate our own emotions in response to these situations. Activity three, saw more positive feelings in the class with all participants being able to identify ways in which we might mitigate the consequences of climate change. Children were more hopeful and happier. This change was also reflected in our own feelings as teacher researchers.

In climate change lessons we noted that some learners shifted their views of us from being ‘friendly teacher agreeing with us’ to ‘adult responsible for climate change’. In response to these emotions we had to quickly consider what position to take in the classroom discussion (for example, devil’s advocate, silent observer, political activist). We were also mindful of how the strategies we used intersected with educational content (directed by the National Curriculum (Department of Education, 2013) and classroom management (directed by the Teachers’ Standards (Department of Education, 2012). We had to face, amongst other emotions, anger. Boler (1999) refers to anger as a response to a perceived injustice in terms of Aristotle’s ‘moral’ anger. The moral anger both we and the

children experienced could have been identified as inappropriate or uncivil behaviour. However, we considered it as an essential ‘political emotion’ (Lyman (1981) and witnessed young people being motivated to address injustice through this moral anger. We did not silence voices but encouraged an exploration of the injustices that children identified with regard climate change. In so doing the children were able to consider who could help.

In addition to the way in which emotion was navigated, the children in our study made many drawings of young people when trying to identify who was going to help mitigate climate change. This may indicate, or be the precursor to, eco-anxieties. Children did not identify adults in power to be key agents for change. The drawings were not only of young people, but were also predominantly female, able bodied and white. Our concern then is not only that young people are placing pressure on themselves to find solutions to climate change, but there is an unconscious exclusivity to who they feel will make a difference. How will our societies of diverse communities connect with these people?

Jones (2021) notes that a majority of young people (7-18 years old) have no knowledge of policy and action pertaining to climate mitigation. Mark et al (2021) note that greater eco-anxiety comes when young people see a lack of climate mitigation being taken by governments and authorities. Knowing what actions authorities are taking is essential to lowering levels of anxiety and reducing a tendency for young people to feel it is up to them to sort the problems of climate out by themselves.

We see climate education as needing to include signposting to large scale policy and action, and within that action, represent the diversity of our societies. Time for planning social diversity into climate education and identifying community mitigation actions would ensure learners feel part of a larger, inclusive movement towards change. We call for further work to explore this area and how teachers navigate these issues successfully with different ages and stages.

4.2 How does an ethnographic approach add to our understanding of emotions regarding climate education?

As researchers we became immersed in the classroom. This immersion was assisted by the previous eight months of work we had been doing with the school on climate education. It was also assisted by our previous and ongoing work as teachers and teacher educators. We were familiar with the school environment, how it works and pedagogies relating to the teaching of 9-10-year olds. This enabled us to do what Emerson et al., (1995:133) refers to when they state: ‘Ethnographers must discern local knowledge not simply on the basis of people’s talk but rather through their “talk in interaction”’. We were attempting to notice emotional behaviour in ourselves and others in order to produce specific situated meaning as they occurred. Undertaking classroom ethnography demanded we negotiate the emotions of and with the children. We were professional teachers mindful to policies such as the Teachers Standards (Department of Education, 2012). We were researchers upholding BERA’s (2018) ethical guidelines. We were parents

wanting to protect children from feeling uncomfortable or uneasy. Mills and Morton (2013) note that the educational ethnographers’ challenge is to weave the closeness and rawness of the classroom experience into a context that can be analysed for insights. They acknowledge it is education’s riskiness – it always being unsettling – that makes ethnography the ideal method in which to capture its power and vitality.

Earlier in this paper we introduced Parvez’s (2017) three domains of observing emotion as an ethnographer: witnessing emotional expression, witnessing emotional vulnerability and establishing ties through emotional intimacy. We recognised that, as a teacher researcher working with young people on issues of climate change we were going to witness the first two and become entangled with emotions (both ours and the pupils) through conversations and reflection. Parvez’s final domain is one that looks to establish ties between teacher researcher and pupils. Using ethnographic process gave us opportunity to recognise emotional responses and shared experiences. Using Parvez’s observational domains has allowed us to begin to describe some of the complexity of emotion entangled with teaching climate education.

It should be remembered that this is a small ethnographic study - further research with larger numbers, different ages and in different geographical regions are required with both pupils and teachers to further develop our understanding of climate change education. As ethnographic researchers we attempted to pay close attention to both our own and young people’s emotional responses to climate change education - an area that has been largely been neglected in main stream educational discourse (Bryan, 2020).

Emotions are implicit in the teaching of climate education. We have shared one way that educators may support a dialogic, hopeful pedagogy - where teachers allow time to ask about feelings and possibilities for mitigation. At each step in this three stage process emotions were navigated rather than ignored. We hope that such insights help not only what is taught, but also how climate change education is researched - thus supporting greater wellbeing in the face of growing numbers of young people suffering from eco-anxiety.

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