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Collaboration and care in climate education: Brave responses to an uncertain future

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Abstract

An effective educational response to the climate emergency requires disrupting existing ideas about universities' roles, curriculum design and the relationship between educators, students and communities. This study examines an approach to curriculum development taken by academics at The Open University, UK whilst developing the postgraduate short course 'Teacher development: Addressing the climate emergency'. We sought to challenge hierarchical models of knowledge transfer by working in collaboration with disciplinary experts, grassroots leaders, and young climate activists and foregrounding online and local grassroots practices, students' civic participation, citizen science and intergenerational dialogues. We report on our collaborative autoethnographic study, which we conducted with respect to the course development. This collaborative ethnographic approach has allowed us to externalise and acknowledge the ways in which approaches of collaboration and care have underpinned our course production process, as well as being essential to the ways in which we enable our students to support their own learners. This paper aims to raise awareness of the significance of embracing uncertainty and adopting pedagogies of care and adds to the literature that employs Noddings' Framework of Moral Education to critically examine pedagogical practice. The insights gained will be useful for educators seeking to develop

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climate-related curricula and the collaborative approach taken will be of interest to those developing new curricula in teacher education.

KEYWORDS

climate education, collaborative autoethnography, interdisciplinary collaboration, pedagogy of care, uncertainty

INTRODUCTION

Climate change is the greatest global threat of our time, with people in the countries most affected often least able to mitigate that threat. People currently feel powerless to address the climate emergency (Hickman et al., 2021) and lack the relevant skills and capabilities to do so. To address the climate emergency, people not only need the technical skills to support the transition to low-carbon economies. They also the skills and capabilities to transform unjust social and economic structures and navigate the uncertainty involved in living in a changing environment. These skills and abilities include communication, influencing, problem-solving, critical thinking and teamwork (Cook, 2020; Kwauk & Casey, 2022). Education has a vital role to play in supporting learners to develop the skills and capabilities to reduce and adapt to the impact of climate change.

The uncertainty that the climate emergency brings creates a demand for different kinds of knowledge worldwide and setting new conditions for knowledge production and sharing. Educators can no longer pretend that climate-related learning is all about facts that can be transmitted, and we can no longer pretend we have all the answers. Despite this, however, climate education is often fragmented across the curriculum, taught as 'knowledge to be tested' in isolated disciplines instead of recognising climate change as the most urgent issue facing our species (UNESCO, 2019). Unsurprisingly, learners are currently dissatisfied with the quality of climate-related teaching (SOS International, 2021). Education around skills and values, as well as knowledge, is essential, so that people not only learn *about* the environment but can learn and act *for* the environment (Dunlop & Rushton, 2022; Facer, 2020; Rushton et al., 2023).

Educators need to develop justice-centred pedagogies, educating for empowerment and activism, as well as promoting interdisciplinary and institution-wide approaches. However, many teachers lack the necessary skills, resources or support to deliver effective climate education (Howard-Jones et al., 2021; Teach The Future, 2021). They often also lack the relevant capabilities, their agency limited by personal, social and material factors to the extent that it is often easier to continue with the same curriculum than to engage in the conflict necessary to instigate change (Owens et al., 2023). A great deal of support is needed to interrogate the nature of our research, policy and practice in the field of climate education, recognising our complicity in environmental and human rights violations and acknowledging our own 'implicated subjectivity' (Rothberg, 2019).

In light of these considerations and taking account of the critical role that universities have in responding to the climate crisis (Sterling, 2021), a decision was taken within the Institute of Educational Technology (IET) at The Open University to develop an educational response to the climate emergency that would disrupt existing ideas about universities' roles, curriculum design, and the relationship between educators, students and communities. This response would take the form of a postgraduate short course for educators. Unlike the traditional approach to designing a postgraduate curriculum, where the educators make most of the decisions around content and pedagogy, this course would be designed in collaboration

with disciplinary experts, grassroots leaders and young climate activists. This approach responds to the call for those of us involved in curriculum design to be willing to become learners ourselves, to seek out and appreciate different worldviews and to work across disciplinary boundaries (Sandri, 2022).

The leader of IET's postgraduate curriculum brought together an authoring team whose disciplinary backgrounds include not only educational technology but also language studies, ecology, healthcare, visual art, music and citizen science. Our research and teaching interests are also varied and include equitable and inclusive online teaching and learning; open educational practices; design and evaluation of online communities and tools; energy transition and digitalisation; and social justice in education. Undoubtedly, a strength of our authoring team is that we contribute a diverse range of knowledge, skills and resources. We have each drawn on a wealth of experience that encompasses teaching, research and leadership in education. What unites us all is a strong commitment to social justice and to enabling educators to support learners in all contexts to not only understand the climate emergency but to take action. Following the arguments of Swyngedouw (2011) and MacGregor (2014), we take the position that addressing the climate emergency through education, in any sector, should involve challenging the dominant apocalyptic discourse that leaves no room for dissent and reintroducing the 'political' by supporting learners in democratic participation, public disruptive protest and other direct action.

When approaching the end of the production process, an invitation for the authors to share our experience of writing the course with other academics at the Higher Education and the Climate Crisis Conference prompted us to reflect on those experiences through an autoethnographic study, reported here. We embarked on this approach tentatively. Whilst autoethnography holds unrealised potential for researchers engaged in educational research that seeks to solve real-world problems, the idea of writing from one's own experience is the opposite of what academic researchers in educational technology have trained to do; the very thought of research that focuses on subjective experience produces fear and scepticism (Mao et al., 2023). As a result, more traditional approaches prevail in this area of educational research and comparatively few autoethnographic studies have been published. This paper offers a contribution to this limited body of literature in the educational technology field.

Autoethnography requires a level of openness that is risky and makes researchers vulnerable and yet it is this openness that has the potential to transform institutional culture through making academics visible in a more trusting and inclusive way (Lapadat, 2017). This paper offers an original contribution by openly interrogating our own practice as educators and sharing our use of Noddings' Framework of Moral Education to critically examine pedagogical practice (Noddings, 2002, 2005, 2010).

Our case study—The course 'Teacher development: Addressing the climate emergency'

The development of the course, 'Teacher development: Addressing the climate emergency', draws on recent research, and on the lived experiences of learners and educators in multiple sectors and contexts to explore the variety of ways in which online, blended and technology enhanced education can contribute to addressing the climate emergency. The course gives educators a basis for developing new approaches and teaching strategies that they can apply in their own practice, whatever their role and setting. It is intended that by the end of the course, the educators who study it will be able to support learners in understanding the causes and impacts of the climate emergency. They will be able to critically evaluate a range of pedagogies and theories relevant to addressing the climate emergency through

online teaching or technology-enhanced learning-focused teaching. They will also be able to identify key ethical and moral considerations connected with the climate emergency and the ways in which it is being addressed globally.

The course joins a suite of online, postgraduate short courses already available within the Institute of Educational Technology (IET) at The Open University—courses which can be studied alone or as part of other qualifications, including IET's Masters in Online Teaching. These courses cover many vitally important areas for educators, including creating online courses, evaluating and improving online courses, embedding mental health in the curriculum, accessibility and inclusion, embedding equity and using scholarship to improve practice.

The team brought together to produce the course included learning developers, digital development editors, curriculum managers and assistants, as well as the seven of us working on the course as authors. The production team worked entirely online, with core members coming together for 30-min twice-weekly meetings. The course has been developed in collaboration with disciplinary experts, grassroots leaders and young climate activists, including two young activists from the island of Samoa. The course will be presented for the first time in late 2024, and a taste of the content is already freely available in a 16-h openly licensed course, 'Supporting climate action through digital education', hosted on The Open University's OpenLearn platform.

RESEARCH DESIGN

In our process of reflecting on the design of the course, our methods are similar to those we have used to produce the course itself. They are dialogic, emergent and pragmatic. Writing together and collaboratively offers an alternative to lone working in academic silos that is both powerful and transgressive, disrupting usual patterns of thinking (Abegglen et al., 2022).

Our underpinning approach is loosely based on collaborative autoethnography, loosely in that the term 'ethnography' implies a passive experience of being observed, whilst writing together is an active process requiring agency, fluidity and creativity (Gale & Wyatt, 2017).

Essentially, our experience reflects that of other collaborative ethnographers who describe,

...a group of researchers pooling their stories to find some commonalities and differences and then wrestling with these stories to discover the meanings of the stories in relation to their sociocultural contexts.

(Chang et al., 2013, p. 17)

The benefits of using this approach to inquiry have included the opportunities to critically reflect on our shared experiences of designing curriculum and to learn about ourselves and each other. In engaging with collaborative writing, we come together as an 'assemblage' (Deleuze & Guattari, 1987). We recognise the presence of the ontogenetic, more-than-human force (Gale & Wyatt, 2022) and how the individual or ethnographic 'I' is not fixed but constantly entangled with and re-defined by others in the group (Pławski et al., 2019). We also acknowledge 'writing with' and 'writing as doing' and, in this way, are broadening and deepening our understandings of each other further beyond our experiences of co-authoring the course on its own, a relational process that Gale and Wyatt (2022, p. 81) term 'making kin'.

In conducting our autoethnographic study, we draw on the 'collaborative writing' process described by Richardson (2000, p. 943). We were inspired by one colleague's previous experiences of collaborative writing (Dennis et al., 2023) but adapt this approach to suit our own context and reflect the different needs of the members of our large group. Chang et al. (2013) advise that collaborative autoethnography becomes complex when more than two researchers are involved but that groups of up to 11 members can work together successfully. This influenced our decision to limit membership of our research group to the seven of us listed as authors in this paper. We all had the core responsibility to work on the course as authors, allocated as part of our roles as academics working in the Curriculum Team. We recognise that extending the invitation to others in the team might have entailed different (or similar) contributions and insights. That said, we also made an intentional decision not to involve those employed to work on the course in other roles or those who contributed to the course in other ways, including disciplinary experts, grassroots leaders and young climate activists. This decision is a limitation of our study but one which recognises that these contributors had already given extensively and generously of their time in the creation of the course itself and takes account of ethical guidance for educational research in terms of the time and effort expected of participants (BERA, 2024).

Whilst full participation of every researcher at every stage of a collaborative autoethnography project is the ideal (Chang et al., 2013), some members of our group had more time available than others, so they participated in more stages of generating and analysing the data than those with less time. We have alternated between writing and discussing as a group and solo writing so that our project has benefitted from both self and collective analysis, a technique that can enhance the credibility of collaborative ethnographic data (Mao et al., 2023). Our priorities throughout have been balancing the need to generate a rich and meaningful account with inclusion and balancing principles of openness with those of safety to avoid harm to ourselves, the University or others involved with the course. This is consistent with our university research code of practice (The Open University, 2021). We are conscious that whilst collaborative autoethnography can amplify the voices of those who are less often heard, there is still the potential for the voices of more experienced researchers to be privileged over others (Roy & Uekusa, 2020). To address this concern, different members of the team have taken the lead at different points in the research process.

The steps in our process of writing together, which were not strictly sequential, were as follows:

1. Meeting regularly over a period of 12 weeks in an online space to talk and write about our experiences of developing the course and about our collaborative autoethnography process.
2. Deciding that each member of the group would write a reflective piece, which could be of any length but probably no more than a page, in response to the following prompt: 'Given the focus on pedagogy, interdisciplinarity and writing for an online platform, what factors informed my authoring, including opportunities and challenges?' Alongside the individual contributions, one piece of writing was jointly written by two group members who worked on similar parts of the course.
3. Jointly producing a table, which identified the key themes within the data, and extracting relevant quotes.
4. Commenting on each other's contributions, acknowledging our multiple perspectives, including their contradictions.
5. One member of the group (seventh author) extracting high-level themes.
6. Meeting to discuss the structure of how each theme could be narrated.

We will now present and discuss our findings.

FINDINGS AND DISCUSSION

Our collaborative autoethnographic study revealed three main themes in our reflections about how we approached the development of the climate education course:

- Our positionality—acknowledging how our motivation and work on the course has been enhanced not only by how we are positioned within our own institution and our fields but also by how we are positioned as individuals, both politically and socially.
- Interdisciplinarity—identifying how we have supported each other in working in new ways that reach across disciplinary boundaries and explore new connections.
- Uncertainty—acknowledging that alongside considering how to educate our students to support their learners around the uncertainties associated with the climate crisis we had to address the uncertainties that our work on this topic raised for us.

Whilst recognising that there was significant overlap between these themes, this paper focuses on the third of these: uncertainty. Embracing uncertainty is a vital step in communities becoming more resilient in the face of the climate emergency (Sellberg et al., 2018) and UNESCO have identified learning to deal with uncertainty as an essential part of systems thinking, one of the key competencies around sustainability education for learners of all ages worldwide (UNESCO, 2017).

Knowing that we need to embrace uncertainty is one thing. Learning how to do this is another. Our collaborative autoethnographic study gave us the opportunity to reflect on how we went about embracing uncertainty as a course writing team.

Multiple uncertainties

The theme of uncertainty arose in our study in multiple ways. Firstly, we expressed uncertainty about our own abilities to create this course. In part, this uncertainty reflected our awareness of the need to write a course that would be useful to educators in multiple contexts when most of us usually work in the context of online and distance higher education, as Simon explains:

Narrative—Simon

For me the most challenging parts of the process were in trying to write for a very broad potential audience. We wanted the course to be useful to people working in an educative capacity in adult and community education, schools, colleges, universities and private enterprise.

We came to understand that many of us had additional anxieties about our individual contributions. In trying to articulate them, we used phrases like ‘outsider’ and ‘out of my comfort zone’. Koula’s narrative provides one example:

Narrative—Koula

Looking back at those early days of the course design and development, I felt like a novice. That was despite bringing with me strong experience of working

as a teacher, and of being involved in the development of online courses and educational resources for informal learning at the OU.

We also realised that we experienced uncertainty regarding the role of our own discipline, educational technology, in addressing the climate emergency. Our collaborative writing describes how working on the course production raised questions about whether digital education is part of a sustainable and environmentally just future:

Narrative—Irina

Writing this course through the lens of an educational technologist also made me think about whether digital education is part of a realistic liveable future, or even a survivable planet – something that I hadn't pondered about before co-authoring this course. How much energy do new technologies that keep coming up and that many of us are excited about actually use? How much energy has been spent to train ChatGPT on a supercomputer for example, and what social justice problems, many of which are also relevant to the climate crisis, does this technology exacerbate?

We discussed how we had encouraged the educators studying the course to engage critically with such questions, as Leigh-Anne explains:

Narrative—Leigh-Anne

For me, a critical part of the course is the critique of educational technology and the focus on degrowth and the ways in which we present this alongside the positive aspects of how ed-tech can support educators and learners in addressing the climate crisis. Digital literacy skills are also vital. There's a wealth of information and misinformation about climate change, mitigation and adaptation online and one of our roles was to support our learners, and their learners, in critically engaging with this information.

As we shared the self-doubt and challenges that influenced our work, our reflections suggest that we were conscious of needing to embrace the uncertainties and discomfort that we identified within ourselves:

Narrative—Kathy

Re-reading this, I'm also conscious that climate education is an uncomfortable space for me. I know there's a need for it but it's not an easy place to be. It's scary and big and I don't know enough. Looking back, I also know that I've done some of the work I'm most proud of in uncomfortable spaces.

There are complex mechanisms at work here. Being prepared to embrace vulnerability and discomfort is an important aspect of being an engaged educator (Baker & Burke, 2023), which has the potential to 'create moments of pedagogical possibility' (Motta & Bennett, 2018, p. 636). Just as becoming a student involves being immersed in a liminal, 'uncanny' space and learning to live with the uncertainty of holding different intellectual perspectives in tension (Bayne, 2008), the same is true for educators. In no area is this uncertainty perhaps more prevalent than that of climate education, particularly for those of us who seek to educate teachers. Navigating this uncertainty is hard work (Owens et al., 2023).

To bring about the level of engaged participation needed to address the climate emergency, people need to let go of the illusion of certainty that education often engenders and feel sufficiently concerned and challenged to do the work of unlearning and embracing a diversity of ideas (Sterling, 2021). On the other hand, Sterling suggests, educators also need to create a temporary safe space in which learners can do this and educators need similar 'safe enough' spaces ourselves (Singer-Brodowski et al., 2022). Our autoethnography project provided an opportunity for us to explore our own feelings of uncertainty around working in climate education and appreciate that if we were experiencing this uncertainty, then our learners—educators in other contexts—were likely to be experiencing similar anxieties themselves.

Addressing uncertainty through collaboration

Our reflections helped us to identify how we dealt with our uncertainty through collaboration with each other. Irina's narrative provides one example:

Narrative—Irina

I guess, the biggest challenge I faced with co-writing this course, was the difficulty of not knowing how much I do not know and the fear of missing out on something that is important and can make a difference in climate education. And here is where building on collaboration with colleagues, on their disciplinary strengths, their awareness of the climate news and initiatives (we are all part of different information bubbles in the end!), as well as on our collective reflection really helped.

The personal factors that influence an educator's capability to teach the climate crisis include both confidence and courage (Owens et al., 2023). Our autoethnographic lens helped us to appreciate the extent to which we gained these through our interactions within the authoring team. We recognised that collaboration with other educators would be key to enabling our students to build their own confidence and courage and to recognise their own potential to contribute to education in this space, just as it had been for us:

Narrative—Leigh-Anne

I feel our collaborative learning design and authoring process is a model for how others might collaborate to tackle huge challenges collectively. We felt safe exploring new ideas with each other and admitting lack of knowledge and this allowed for a particularly strong course.

Through our collaborative writing we acknowledged that our uncertainty about shaping our own contributions inspired us to seek out a diverse range of expertise and experience. To apply her expertise in citizen science to the context of climate education, for example, Maria recognises how she engaged with academics from around the world, as well as learning from colleagues' theoretical and political knowledge shared via other, earlier parts of the course:

Narrative—Maria

I sought consultation from external colleagues whose focus is on sustainability and environmental education across the world. I concluded adding different

types of planning guidance, focusing on guidelines from environmental education organisations, the European sustainability competence framework and recommendations from systematic literature reviews on efficient practices in climate change. Reflecting on the variety of resources out there, I went back to what my colleagues wrote in the earlier weeks and engaged with theories (i.e. climate justice) and political landscapes that I was not familiar with.

In a similar way, other authors' narratives identified how we drew on contributions from individuals and communities that provided a much more diverse range of perspectives and experiences than we might usually access when writing learning materials. We learned from these contributors as we went along, as Carmel explains:

Narrative—Carmel

It was a fascinating learning journey for me. About the topic of the climate crisis, but also about this magical collaborative process that begins with a group of people holding a set of very diverse knowledge bases and a wide scale of pedagogical viewpoints, working to co-create something that no one had any idea about how it would turn out to be. This course was literally shaped by ongoing, iterative interactions between people who are experts in many disciplines, existing literature, grassroots knowledge bases, and many young people and educators from across the world, each bringing their own climate into this global shared ecological system.

This knowledge that the climate emergency needs to be tackled in collaboration with others also influenced our decisions around course design. We built opportunities for learners to connect with others throughout the course and encouraged them to create similar opportunities for their own learners, including a section of the course about designing online communities for collaboration around addressing the climate emergency.

Addressing uncertainty through a pedagogy of care

Our collaboration in producing the course included supporting each other in handling uncertainty and the emotional impact of writing about the climate crisis. It was obvious, then, that we would also need to support our learners in coping with uncertainty. This awareness was central to the choices we made around course content and pedagogy, responding to the call to create time and space to acknowledge and discuss the topic of care within the curriculum (Baker & Burke, 2023).

Awareness of the huge wave of uncertainty generated by the climate crisis influenced the pedagogies that informed our own practice whilst developing the course. When we wrote about this in our collaborative autoethnography, we described a range of approaches, including open pedagogies, social learning and critical digital pedagogy. From the outset of the course production process, we deliberately and overtly adopted a position of 'constructive hope' (Marlon et al., 2019) and 'active hope that is anchored in practice' (Houlden & Veletsianos, 2020). We positioned ourselves in a collegiate, non-hierarchical relationship with the educators studying our course, following the principles of critical digital pedagogy, which prioritise listening, collaboration and nurturing community in digital learning spaces (Stommel, 2014).

Within the course, we built in time and activities to support learners in focusing on their own wellbeing, recognising that studying the topic of the climate emergency is challenging.

This included strategies such as mindfulness, sharing anxieties with others and spending time away from studying, to be outside and active. We incorporated content to support educators in thinking about their learners' wellbeing and understanding the impact of the anxiety and distress people experience around the climate crisis, even if we have yet to experience the effects ourselves. Educators are well-placed to address the anxiety and distress that climate change causes. We designed activities to help our learners appreciate the importance of acknowledging this anxiety and distress (Hickman et al., 2021) and to re-frame it in terms of a healthy response to what is happening in the world (Sharp & Hickman, 2019). This requires incorporating elements of 'constructive doubt'—'the reality of the threat, the need for more action' (Marlon et al., 2019) and planning teaching in such a way as to make space for this. In partnership with educators and students in multiple contexts we have created audiovisual resources to provide inspiration for facilitating these important processes.

Above all, we identified a firm shared commitment to adopting a pedagogy of care, an educational approach that prioritises empathy and the development of learners in a nurturing, supportive, and equitable learning environment (Kukulska-Hulme et al., 2023). This pedagogy involves intensive emotional labour and yet this is rarely acknowledged in the university context (Kennedy et al., 2022). We were designing content that is to be studied completely online and the extent to which caring actions can be motivated by true feelings of concern has been questioned in the context of teaching that is mediated by online systems (Adams & Rose, 2014). Nevertheless, our own thoughts about the importance of care are apparent in the following written conversation:

Narrative—A conversation around pedagogy of care
Kathy: Emotional aspects of learning are also an important consideration for me. Many of the parts of the course I am writing focus on the relationship between the climate emergency and health, including mental health. I am influenced by pedagogies of care, knowing that before people can act in relation to the climate emergency, they need to acknowledge and talk about the feelings of extreme anxiety and powerlessness that this crisis generates. And this includes educators themselves. Building in time for learners to consider and address their own well-being is a priority for me and I wonder if we could do even more of this throughout the course.

Irina: For me, pedagogy of care is central to climate education and to our course. Education systems worldwide often overemphasise academic achievement at the expense of nurturing caring individuals. However, recent global challenges brought by the Covid-19 pandemic and the ongoing climate crisis raised new challenges for educators related to finding a way to foster a deep connection and care among learners. During Covid-19, the response from even the most market-driven sectors has been about protecting human life and looking after each other. Perhaps, if learners have the experiences of being cared for or of seeing others model care, then they may feel a stronger obligation to care, both for the environment and for other people?

Leigh-Anne: I feel that a pedagogy of care should transcend all other pedagogical approaches. I've written on the topic for a while, influenced by the work of Maha Bali, and agree with others that the collaborative process of creating this course, and the content, is entirely care-centred. As authors we showed care for each other, being open about the emotional impact of writing about the climate crisis. The culture of care and support allowed us each to work outside our disciplinary specialisms and to explore new connections and fusions together. I felt great responsibility, as the initiator for this course and as production chair, for ensuring colleagues were cared for and also that we enacted our duty of care for our learners, supporting them in working with challenging topics.

Carmel: I strongly relate to this approach of yours Kathy. Especially when dealing with such sensitive content it is vital to educators to understand that the cognitive processes of

learning cannot be carried effectively (or at all sometimes) unless the learners' nervous systems are regulated.

Maria: Although I didn't have the 'pedagogy of care' in mind, I was aware that both our learners' and their learners' wellbeing might be impacted by our climate change topic. It was important to choose activities—and even wording—that will not make learners feel guilty or anxious about the future, while in parallel, focusing on individual and group action.

Maha Bali, mentioned by Leigh-Anne in the conversation above, suggests that genuine care is sometimes the most valuable thing educators can offer learners, caring not simply about their academic progress but their wellbeing, happiness and whole selves (Bali, 2015). Similarly, Tronto (2013) argues that it is more important for educators to prepare learners to care than to prepare them for the world of work. Course design can be an integral part of this care. Burke and Larmar (2021), who contend that pedagogies of care take on particular significance for educators working in online settings, propose that Noddings' Framework of Moral Education can provide a helpful lens to critically examine pedagogical practice (Noddings, 2002, 2005, 2010). This framework outlines how caring in education happens through four processes: modelling; dialogue; practice; and confirmation.

The first element of Noddings' framework is modelling. Our modelling of care-full approaches is apparent in our conversation at two levels: we identify the ways in which we have encouraged our learners on the course to consider how pedagogies of care should be at the heart of climate education, but also how we have adopted this pedagogy for our own teaching and learning. This includes our learning about how to be with and work with each other. This approach was adopted intuitively, with little prior discussion between the course authors. As Noddings (2010, p. 147) suggests, educators, 'do not 'care' in order to model caring; we model care by caring'.

The second element of Noddings' framework is dialogue. Whilst dialogue is key to effective online distance education, the absence of non-verbal cues, eye-contact and informal conversation mean that it can be harder to establish (Burke & Larmar, 2021). Again, our attention to this element is apparent in our conversation about care above and our other narratives at multiple levels. Firstly, we were conscious of the need to promote dialogue between ourselves, the course production team, and all of the course contributors. Working remotely made us particularly aware of this. Secondly, we were conscious of the need to enable dialogue with and between the learners for whom we were designing the course, both whilst they are studying it, but also afterwards as course alumni. We tried to share our own experiences and real-world examples as we wrote the course materials and we worked to design activities that enabled students to do the same. As we explain above, we were also keen to promote this collaborative approach for our students to use with their own learners, and this became a strategy for managing uncertainty.

The third element of Noddings' framework is practice. This involves the creation of authentic learning and experiences that build learners' capacity to care (Burke & Larmar, 2021). One aspect of our writing where this component of the model was evident was in our reflections on the design of the course assessment:

Narrative—Kathy and Simon

We wanted an assessment task to which learners could bring all of themselves and their knowledge and experiences. We wanted an authentic assessment task that would have relevance and applicability beyond the course to support learners in transforming their teaching practice. We also wanted a task that would be engaging and enjoyable and offer learners an element of choice and contextualisation.

The assessment we created invites students to design an intervention relevant to learning in their own context and to draw on their course learning in justifying their decisions, thus embracing the whole student and recognising their knowledge, capacities and experiential wisdom (Motta & Bennett, 2018). The intervention could be a lesson or workshop plan but could also be a digital storytelling project, a citizen science initiative, the creation or development of an educators' online community of practice, an online climate café initiative, the creation or transformation of the curriculum or the creation or transformation of an educational policy at the organisational level.

The fourth and final element of Noddings' framework is confirmation. This is concerned with pointing learners towards a better version of themselves through affirmative feedback (Noddings, 2010). It can be challenging to have sufficiently focused conversations around learners' achievements within the online learning environment, especially within courses that involve learning at scale. In this regard, Burke and Larmar (2021, p. 611) encourage educators to consider whether we are 'lighting fires' and to examine the extent to which there is evidence of transformative learning in students' own feedback. This is something we can do as learners begin to engage with the course.

CONCLUSION

Educational responses to the climate emergency necessitate a re-evaluation of educational institutions' roles, curriculum design, and the interactions between educators, students and communities. Our answer to navigating our own uncertainties around climate education has been to access learning and support, not only from each other, but from a broad community of other learners and teachers who are seeking to navigate their own uncertainties. We have come to understand that in the face of the climate emergency, a 'wicked' problem, which challenges what we understand learning to be, the 'community is the curriculum' (Cormier, 2024). To confront our uncertainties, we must be prepared to collaborate and to care for and with each other.

Once people identify and label their feelings as uncertainty and understand what is causing it, then this uncertainty can become a catalyst for creativity (Hoffman et al., 2022). Our own uncertainty has offered exciting potential for creativity, both for our team and for our learners, as a final contribution from Carmel illustrates:

Narrative—Carmel

When I joined the authoring team, I was not at all clear about my own take on climate education. I had a good sense of the knowledge gaps I held about the climate crisis's scientific perspectives—obviously, I was not (still am not) an expert on that front, which made me hesitant about my ability to contribute, but also excited to deep-dive into this non-boundaried ocean. I saw each of us swimming, sailing and revealing new topographies, islands, sea creatures and fellow sailors while portraying new partial maps on the go. This set of partial maps is now stitched up into this course, suggesting some pathways, but still leaving space for more maps and for more educators to jump into this ocean and refine and reshape those maps to fit their own context, values, perspectives and more than everything—learners.

The completion of our work on the course is not at an end, merely at one of many beginnings, as learners engage with the materials that we have produced and take their own learning, and subsequently their teaching, in new directions.

We hope that our reflections will inspire educators seeking to address the climate emergency, as well as those designing curricula for teacher education in other contexts, encouraging them to recognise the importance of acknowledging and embracing uncertainty and in doing so, taking every opportunity to collaborate and adopt pedagogies of care. We also hope that this open interrogation and sharing of our own practice via this collaborative autoethnographic account will encourage others working in the field of climate education to take a similar approach.

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The authors have no conflict of interest to declare.

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Data available on request due to privacy/ethical reasons.

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REFERENCES

- Abegglen, S., Burns, T., & Sinfield, S. (2022). Supporting university staff to develop student writing: Collaborative writing as a method of inquiry. *Journal of Learning Development in Higher Education*, 23. <https://doi.org/10.47408/jldhe.vi23.839>
- Adams, C., & Rose, E. (2014). "Will I ever connect with the students?" Online teaching and the pedagogy of care. *Phenomenology & Practice*, 8(1), 5–16. <https://doi.org/10.29173/pandpr20637>
- Baker, S., & Burke, R. (2023). *Questioning care in higher education: Resisting definitions as radical*. Springer International Publishing. <https://doi.org/10.1007/978-3-031-41829-7>
- Bali, M. (2015, April 20). *Pedagogy of care—Gone massive*. Hybrid Pedagogy. <https://hybridpedagogy.org/pedagogy-of-care-gone-massive/>
- Bayne, S. (2008). Uncanny spaces for higher education: Teaching and learning in virtual worlds. *Research in Learning Technology*, 16(3), 197–205. <https://doi.org/10.1080/09687760802526749>
- BERA. (2024). *Ethical guidelines for educational research* (5th ed.). BERA. <https://www.bera.ac.uk/publication/ethical-guidelines-for-educational-research-fifth-edition-2024>
- Burke, K., & Larmar, S. (2021). Acknowledging another face in the virtual crowd: Reimagining the online experience in higher education through an online pedagogy of care. *Journal of Further and Higher Education*, 45(5), 601–615. <https://doi.org/10.1080/0309877X.2020.1804536>
- Chang, H., Ngunjiri, F., & Hernandez, K.-A. C. (2013). *Collaborative auto-ethnography*. Routledge.
- Cook, I. (2020). Future graduate skills: A scoping study. https://www.sustainabilityexchange.ac.uk/files/future_graduate_skills_report_change_agents_uk_eauc_october_2020.pdf
- Cormier, D. (2024). *Learning in a time of abundance: The community is the curriculum*. Johns Hopkins University Press.

- Deleuze, G., & Guattari, F. (1987). *A thousand plateaus*. University of Minnesota Press.
- Dennis, C. A., Chandler, K., & Puntill, D. (2023). Practice and the professional doctorate: A diffractive re-reading. *Journal of Further and Higher Education*, 47(3), 364–377. <https://doi.org/10.1080/0309877X.2022.2130197>
- Dunlop, L., & Rushton, E. A. C. (2022). Putting climate change at the heart of education: Is England's strategy a placebo for policy? *British Educational Research Journal*, 48(6), 1083–1101. <https://doi.org/10.1002/berj.3816>
- Facer, K. (2020). *Beyond business as usual: Higher education in the era of climate change*. Higher Education Policy Institute. https://www.hepi.ac.uk/wp-content/uploads/2020/12/HEPI_Beyond-business-as-usual_Higher-education-in-the-era-of-climate-change_Debate-Paper-24_FINAL.pdf
- Gale, K., & Wyatt, J. (2017). Working at the wonder: Collaborative writing as method of inquiry. *Qualitative Inquiry*, 23(5), 355–364. <https://doi.org/10.1177/1077800416659086>
- Gale, K., & Wyatt, J. (2022). Making trouble with ontogenesis: Collaborative writing, becoming, and concept forming as event. *Qualitative Inquiry*, 28(1), 80–87. <https://doi.org/10.1177/10778004211026898>
- Hickman, C., Marks, E., Pihkala, P., Clayton, S., Lewandowski, R. E., Mayall, E. E., Wray, B., Mellor, C., & Van Susteren, L. (2021). Climate anxiety in children and young people and their beliefs about government responses to climate change: A global survey. *The Lancet Planetary Health*, 5(12), e863–e873. [https://doi.org/10.1016/S2542-5196\(21\)00278-3](https://doi.org/10.1016/S2542-5196(21)00278-3)
- Hoffman, J. D., McGarry, J., & Seibyl, J. (2022). Beyond tolerating ambiguity: How emotionally intelligent people can channel uncertainty into creativity. In R. A. Beghetto & G. J. Jaegar (Eds.), *Uncertainty*. Springer International Publishing AG.
- Houlden, S., & Veletsianos, G. (2020). The problem with flexible learning: Neoliberalism, freedom, and learner subjectivities. *Learning, Media and Technology*, 46, 144–155. <https://doi.org/10.1080/17439884.2020.1833920>
- Howard-Jones, P., Sands, D., Dillon, J., & Fenton-Jones, F. (2021). The views of teachers in England on an action-oriented climate change curriculum. *Environmental Education Research*, 27(11), 1660–1680. <https://doi.org/10.1080/13504622.2021.1937576>
- Kennedy, E., Oliver, M., & Littlejohn, A. (2022). “You make yourself entirely available”: Emotional labour in a caring approach to online teaching. *Italian Journal of Educational Technology*, 30(1), 30–48. IJET-online first. <https://doi.org/10.17471/2499-4324/1237>
- Kukulka-Hulme, A., Bossu, C., Charitonos, K., Coughlan, T., Deacon, A., Deane, N., Ferguson, R., Herodotou, C., Huang, C.-W., Mayisela, T., Rets, I., Sargent, J., Scanlon, E., Small, J., Walji, S., Weller, M., & Whitelock, D. (2023). *Innovating pedagogy 2023: Open University Innovation Report 11*. The Open University.
- Kwauk, C. T., & Casey, O. M. (2022). A green skills framework for climate action, climate empowerment, and climate justice. *Development Policy Review*. <https://doi.org/10.1111/dpr.12624>
- Lapadat, J. C. (2017). Ethics in autoethnography and collaborative autoethnography. *Qualitative Inquiry*, 23(8), 589–603. <https://doi.org/10.1177/1077800417704462>
- MacGregor, S. (2014). Only resist: Feminist ecological citizenship and the post-politics of climate change. *Hypatia*, 29(3), 617–633. <https://doi.org/10.1111/hypa.12065>
- Mao, J., Romero-Hall, E., & Reeves, T. C. (2023). Autoethnography as a research method for educational technology: A reflective discourse. *Educational Technology Research and Development*. <https://doi.org/10.1007/s11423-023-10281-6>
- Marlon, J. R., Bloodhart, B., Ballew, M. T., Rolfe-Redding, J., Roser-Renouf, C., Leiserowitz, A., & Maibach, E. (2019). How hope and doubt affect climate change mobilization. *Frontiers in Communication*, 4, 20. <https://doi.org/10.3389/fcomm.2019.00020>
- Motta, S. C., & Bennett, A. (2018). Pedagogies of care, care-full epistemological practice and ‘other’ caring subjectivities in enabling education. *Teaching in Higher Education*, 23(5), 631–646. <https://doi.org/10.1080/13562517.2018.1465911>
- Noddings, N. (2002). *Educating moral people*. Teachers College Press.
- Noddings, N. (2005). *The challenge to Care in Schools* (2nd ed.). Teachers College Press.
- Noddings, N. (2010). Moral education and caring. *Theory and Research in Education*, 8(2), 145–151. <https://doi.org/10.1177/1477878510368617>
- Owens, J., Greer, K., King, H., & Glackin, M. (2023). Conceptualising HE educators' capabilities to teach the crisis: Towards critical and transformative environmental pedagogies. *Frontiers in Education*, 8, 1193498. <https://doi.org/10.3389/educ.2023.1193498>
- Plawski, M., Szwabowski, O., Szczepaniak, C., & Wężniewska, P. (2019). Friendly writing as non-inquiry: The problems of collective autoethnographic writing about collective autoethnographic writing. *Qualitative Inquiry*, 25(9–10), 1002–1010. <https://doi.org/10.1177/1077800418809134>
- Richardson, L. (2000). Writing: A method of inquiry. In N. K. Denzin & Y. Lincoln (Eds.), *Handbook of qualitative research* (2nd ed., pp. 923–948). SAGE Publications, Inc.
- Rothberg, M. (2019). *The implicated subject: Beyond victims and perpetrators*. Stanford University Press.

- Roy, R., & Uekusa, S. (2020). Collaborative autoethnography: "Self-reflection" as a timely alternative research approach during the global pandemic. *Qualitative Research Journal*, 20(4), 383–392. <https://doi.org/10.1108/QRJ-06-2020-0054>
- Rushton, E. A. C., Sharp, S., Kitson, A., & Walshe, N. (2023). Reflecting on climate change education priorities in secondary schools in England: Moving beyond learning about climate change to the emotions of living with climate change. *Sustainability*, 15(8), 6497. <https://doi.org/10.3390/su15086497>
- Sandri, O. (2022). What do we mean by 'pedagogy' in sustainability education? *Teaching in Higher Education*, 27(1), 114–129. <https://doi.org/10.1080/13562517.2019.1699528>
- Sellberg, M. M., Ryan, P., Borgström, S., Norström, A., & Peterson, G. (2018). From resilience thinking to resilience planning: Lessons from practice. *Journal of Environmental Management*, 217, 906–918. <https://doi.org/10.1016/j.jenvman.2018.04.012>
- Sharp, V., & Hickman, C. (2019, October 13). Eco-anxiety, eco-despair, eco-depression, eco-grief? Or maybe... eco-empathy? [Interview]. <https://climatepsychologyalliance.org/podcasts/402-podcast-eco-anxiety-eco-despair-eco-depression-eco-grief-or-maybe-eco-empathy>
- Singer-Brodowski, M., Förster, R., Eschenbacher, S., Biberhofer, P., & Getzin, S. (2022). Facing crises of unsustainability: Creating and holding safe enough spaces for transformative learning in higher education for sustainable development. *Frontiers in Education*, 7, 787490. <https://doi.org/10.3389/educ.2022.787490>
- SOS International. (2021). Students, sustainability and education: Results from a survey of students in higher education around the world. https://sos.earth/wp-content/uploads/2021/02/SOS-International-Sustainability-in-Education-International-Survey-Report_FINAL.pdf
- Sterling, S. (2021). Concern, conception, and consequence: Re-thinking the paradigm of higher education in dangerous times. *Frontiers in Sustainability*, 2, 743806. <https://doi.org/10.3389/frsus.2021.743806>
- Stommel, J. (2014). *Critical digital pedagogy: A definition*. Hybrid Pedagogy. <https://hybridpedagogy.org/critical-digital-pedagogy-definition/>
- Swyngedouw, E. (2011). Depoliticised environments: The end of nature, climate change and the post-political condition. *Royal Institute of Philosophy Supplement*, 69, 253–274. <https://doi.org/10.1017/S1358246111000300>
- Teach The Future. (2021). Research with UK teachers on the current state and future of climate education. <https://www.teachthefuture.uk/teacher-research>
- The Open University. (2021). *Research code of practice*. The Open University.
- Tronto, J. (2013). *Caring democracy: Markets, equality, and justice*. University Press.
- UNESCO. (2017). Education for sustainable development goals: Learning objectives. <https://unesdoc.unesco.org/ark:/48223/pf0000247444>
- UNESCO. (2019). *Country progress on climate change education, training and public awareness: An analysis of country submissions under the United Nations Framework Convention on Climate Change*. Education for Sustainable Development, United Nations Educational, Scientific and Cultural Organization.

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