Conceptualising HE educators' capabilities to teach the crisis: towards critical and transformative environmental pedagogies

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This article aims to help conceptualise the capabilities that educators in higher education (HE) have to incorporate concerns about environmental breakdown in their day-to-day teaching. A common view amongst those in the academic literature is that Higher Education Institutions (HEIs) are failing to rise to the challenge presented by the unfolding environmental crisis. While agreeing that those in HE must do more, this article critically examines the assumption that such action can be easily enacted by HE educators. Our analysis employs the capabilities approach (CA) to illuminate the challenges surrounding HE educators' agency to teach the crisis in their day-to-day practice, and to consider what would be needed to provide them with genuine opportunities to do so. We argue that access to the growing number of teaching resources about the environmental crisis is a necessary but insufficient condition for supporting HE educators' capabilities to teach the crisis. For a fuller understanding of what is required to support the agency of HE educators, attention must be paid to the diverse combination of factors that shape HE educators' opportunities to develop and enact critical and transformative environmental pedagogies in their disciplinary and institutional contexts. Drawing on the extant academic literature and with reference to a fictionalised case study we examine how HE educators' agency is mediated by a range of personal, material and social factors. Our analysis focuses especially on the role played by social factors, including the influence of: dominant epistemological, methodological and disciplinary norms; prevailing institutional policies and practices, and; administrative and management cultures within and across HE. After discussing the importance that deliberation has in supporting educators' agency and the development of novel forms of critical and transformative environmental pedagogy, we conclude by suggesting that in many cases enacting such pedagogies will involve confronting dominant forms of power, culture, policy and practice, within the academy and beyond.

KEYWORDS

capabilities, climate, critical pedagogy, environmental education, higher education, pedagogy, sustainability, transformative pedagogy

1. Introduction

We face a profound environmental crisis that incorporates anthropogenic climate breakdown, the accelerating loss of biodiversity, and global material and social inequalities (IPCC, 2023). The ramifications of this crisis have the potential to be catastrophic for human societies and the natural world alike (Bradshaw et al., 2021). Mitigating its worst effects is possible by making rapid and deep changes to our societies, however the global response to date

is proving inadequate (IPCC, 2023). Despite our ever growing knowledge of the ecological dangers we face and our extraordinary capacity to subject the natural world to our will, human beings seem incapable of transforming our societies.

This article examines the question of what educators working across higher education (HE) disciplines and contexts can do to teach the environmental crisis in ways that support critical thinking and promote social transformation. It is primarily concerned with conceptualising the agency HE educators have (or may not have) to 'teach the crisis', that is, to develop and enact critical and transformative pedagogies that address the environmental crisis in their day-to-day practice. By 'critical environmental pedagogy' we mean education that supports students' understanding of the role of power in social life, and which fosters concern *for* (not simply *about*) the environment. By 'transformative environmental pedagogy' we mean forms of teaching that foster learners' attitudes and abilities to take action in response to the unfolding environmental crisis, and are not limited to simply providing knowledge of it. We take the HE sector in the United Kingdom as our starting point, but the globalised nature of contemporary Higher Education and the exportation of Western, and in particular anglophone, academic culture and practice means our findings will have resonance in many other international contexts (Altbach and Knight, 2007). We use philosophical analysis to clarify the nature and formation of the opportunities that HE educators have to teach the crisis, and draw on Amartya Sen's Capabilities Approach (CA) as a set of theoretical and methodological tools for supporting greater understanding in this area (Sen, 1999, 2009). We argue that greater attention must be paid to the social, cultural and institutional factors which govern the HE sector, and which shape the opportunities that educators have to develop and enact transformative forms of educational practice across the HE sector. Our analysis highlights the complex and open-ended nature of teaching the crisis across HE disciplines and contexts, as well as a more general need for reflection on the way power and culture operate within and across the HE sector to shape, for better or worse, the opportunities educators have to develop and enact critical and transformative pedagogical responses to the environmental crisis in their day-to-day work.

We begin by briefly sketching out the prevailing context and describing the dominant attitudes, discourses and approaches that higher education institutions (HEIs) take towards the environmental crisis. After introducing the CA, we then draw on the extant academic literature to examine the myriad factors which shape HE educators' capabilities to teach the crisis, before finally discussing the need for conditions across HE that foster greater deliberation, criticality and opportunities to identify and challenge forms of power which have contributed to the environmental crisis. We introduce a fictionalised vignette that considers the agency of Ali, a HE educator seeking to find ways of teaching the crisis in her own practice, as a case study to support the discussion and ground the analysis in context.

2. Higher education institutions and environmental education

The claim that academia *must* do more to address the environmental crisis is hard to resist. We believe HEIs are obliged to provide leadership in response to the unfolding crisis because as informed and influential actors they have a responsibility to promote forms of action that will mitigate future harms. HEIs' core activities of knowledge production,

education and service to their communities mean that they are uniquely positioned to lead the societal change required to address the unfolding environmental crisis (Facer, 2020). HEIs can and do shape public understanding and discourse, and are often well placed to influence other stakeholders, including through the development of educational practices in schools, colleges and other educational institutions. Many HEIs are situated within local communities while also having a global reach with students, alumni, staff and research as channels for generating influence and disseminating change. There is a strong case for saying that if a stakeholder has the ability to reduce future harm and mitigate injustice (by recognising their own and others' contributions to these harms and by working towards their amelioration) then they are obliged to do just this.[1] As influential stakeholders who have helped shape the status quo and have the potential to initiate forms of social change HEIs clearly hold such obligations.

In a broad sense, education has contributed to the crisis through the production and reproduction of the prevailing forms of knowledge, culture, discourse and social interaction that have led society to the current state of environmental emergency (Kinol et al., 2023; McGeown and Barry, 2023). Today's HE students will be amongst societies' leaders in the near future, so what they learn and how they think and act matters greatly. Changes to education are therefore essential to achieving the social transformation required to mitigate the worst forms of the crisis (Sterling, 2017). The anthropogenic causes of the environmental crisis means that wide scale social change must be underpinned by forms of critical reflection that challenge and disrupt the patterns of thought, behaviour and the broader social formations and arrangements (Stoddard et al., 2021). We are in urgent need of critical and transformative approaches to education that foster learners' attitudes and abilities to understand and take action in response to the interconnected problems of climate breakdown, the destruction of non-human species and ecosystems, as well as rising social and material inequalities.

While establishing the normative claim that HEIs have a collective responsibility to teach the crisis is important, questions about how and by what means this can be achieved have typically received less attention with their complexity overlooked. Indeed, the rhetoric of many HEIs, particularly across the Global North, would suggest that this task is already in hand, and that responding to the environmental crisis is already at the forefront of HEIs' agendas. Studying the pronouncements of HEIs in the United Kingdom, Latter and Capstick found 'universities do, on the face of it, appear to be firmly committed to action and to be pursuing this towards addressing sustainability', and their analysis identifies that 37 UK HEIs had made declarations of a climate emergency (Latter and Capstick, 2021: 6). The extent to which this commitment is shared across the globe is unclear, although to date 1,188 academic institutions are involved in the United Nations Environment Program's 'Race to Zero' campaign, including 165 from the United Kingdom and 337 from the United States.

For the most part, discourse about and action towards environmental leadership from HEIs is oriented towards reducing the environmental impact of their operations. This has typically involved

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1 See for example Eckersley's social connection model of responsibility which sets out a notion of collective but differentiated obligations for members of societies that jointly re/produce environmental harms 'through recurrent social practices that are considered "normal" and therefore non-blameworthy' (Eckersley, 2016: 2).

initiatives that aim to divest institutional finances from fossil fuels, lower carbon emissions through changes to estate practices, the creation of sustainability portfolios, and the development and enactment of sustainability strategies (Leal Filho et al., 2019). For example, a recently published document produced by 15 UK HEIs described as a 'sector-led proposal for action and connected thinking' for the UK Tertiary Education Sector to meet its Net Zero ambitions (Royal Anniversary Trust, 2023: 1) has little to say about developing pedagogy, and instead prioritises measures around estates, travel and transport, supply chains, finance and investment, resources and the training and development of professional services staff working in estates and across strategic, financial, human resources. The absence of plans for developing educational policies and practices to teach the crisis is striking, and illustrates the marginal role that pedagogical innovation, and education more broadly, has within the HE sector's response to the environmental crisis. The shortfall in planning has also been observed in practice, where research conducted in the United Kingdom by the Alliance for Sustainability Leadership in Education found that the concerns that HEIs' students and staff have for implementing meaningful responses to the environmental crisis are unmatched by substantive actions within their institutions (EAUC, 2019). While operational changes across the sector are clearly important for reducing the direct impact HEIs have on the environment and should be welcomed, they represent just one of multiple areas of activity that are required (McCowan, 2020). Indeed, the effects of operational changes could be dwarfed by the potential indirect impacts of a broad-based programme of transformative education that successfully fosters societal change. It is therefore troubling that, as Stewart et al. (2022) and Sterling (2021) have argued, HEIs are largely failing to engage deeply with the unfolding crisis in and through their pedagogical policies and practices. Indeed, Green (2021: 1) goes further, suggesting that HEIs are 'increasingly part of the problem, not the solution' to the environmental crisis.

Where HEIs have developed new forms of teaching to respond to environmental concerns, these have often taken the form of stand-alone environmental education modules that are typically taught in a piecemeal fashion, as 'add on' stand-alone units (Hegarty et al., 2011). These initiatives are a start; however, they risk marginalising education that addresses the environmental crisis within the HE curriculum in the way that has occurred across secondary education (Glackin and King, 2018), and seem likely to preclude deep and critical forms of environmental education from becoming embedded across disciplinary contexts. Such stand-alone units can offer a 'free pass' to existing programmes, allowing them to continue teaching as usual, thereby preventing environmental questions and concerns from being integrated across the university (Hegarty et al., 2011). There are also concerns that stand-alone modules may not support deep and critical engagement that the crisis demands. Indeed, Alcántara-Rubio and colleagues found that where stand-alone modules are oriented towards 'mere 'image clean-up' by including the SDGs in a superficial manner' (Alcántara-Rubio et al., 2022: 1610) they risk trivialising the environmental crisis. Moreover, where these stand-alone units fail to examine the social, political and economic dimensions of the environmental crisis they can end up reproducing the epistemological and cultural structures which have contributed to it and preventing the development of more (urgently needed) critical and transformative approaches. For instance, the sustainable development paradigm which dominates many HEIs' environmental initiatives (and indeed those of the United Nations Environment Project, including the Race to Zero campaign) is itself aligned to a global economic model – neoliberal

capitalism – that is committed to economic growth and anthropocentrism (Kopnina, 2020; Warlenius, 2022). This economic model continues to play a central role in the destruction of the natural world, de-centring more ecologically oriented agendas and suppressing more ambitious and transformative discourses (Bessant et al., 2015; Lele, 2017). Shallow approaches to environmental education that do not match the scale of the crisis (including appreciation of the extent of the risks faced, and the complex and multidimensional demands of justice), which neglect critical engagement with its causes and consequences, and which fail to offer the necessary transformative, action-oriented approach that is urgently required must therefore be seen as inadequate.

To summarise, HEIs are typically more interested in responding to the environmental crisis by greening their operations than developing their educational provision. Existing forms of environmental education seem not only piecemeal and inadequate, but may often prevent the development of critical and transformative pedagogical approaches that are required. Thus, there is a need and a demand for HEIs to develop and enact more ambitious pedagogies that will support critical engagement with and transformative responses to the environmental crisis.

Given the scale of the crisis faced and the action required it would be woefully insufficient to leave the task of developing and enacting transformative environmental education to the usual suspects in the ecological and geographical sciences, while allowing the rest of the arts and sciences to retain a 'business as usual' approach that is supplemented by access to an optional generic 'sustainability' module. Academic institutions around the globe, but particularly in the North, typically reproduce anthropocentric epistemologies and value judgements derived from Western modernity which construct and subjugate the 'natural world' as a separate class of being in the service and dominion of human societies (Bonneuil and Fressoz, 2016; Kopnina, 2020; Machado de Oliveira, 2021; Sultana, 2022; McGeown and Barry, 2023; Nussbaum, 2023). It is therefore the responsibility of all educators from across the entire disciplinary spectrum to develop critical and transformative pedagogy within their subjects that deconstruct and address the values, discourses and practices which have contributed to the present crisis. This demands a fundamental re-evaluation of many deeply entrenched assumptions, including: who we, as human beings, are as a species; how we relate to non-human species and ecosystems; how we have arrived at this crisis point in history; where we as communities, societies and as a species are heading; what contribution existing forms of knowledge, discourse, organisation and technology have made to the crisis to date; and what they might bring to any future action. Critical reflection and radical thinking are urgently needed from all academic disciplines, from mathematics to music, and from medicine to management.

It ecolonizing to see the recent proliferation of online pedagogical resources that promote more critical and constructive engagement with environmental crises across HE teaching. For example, the seed library developed by the Faculty for a Future provides a wealth of information, approaches and models for critically engaging with the environmental crises across a wide variety of disciplines. Examples of genuinely transformative pedagogical practice in HE include the work of Andreotti and her colleagues who are located in British Columbia on the lands of the Musqueam people, and sharing their approaches through decolonialfutures.net, or the pioneering approaches of Schumacher College, in Devon, United Kingdom. However, such practices are far from widespread across the sector, typically existing in isolated pockets and dependent on the particular expertise and/or commitments of

determined individuals or groups working within relatively aligned disciplines. At one level, sharing transformative pedagogical resources that engage with the crisis – curricula, pedagogical approaches, assessment models, etc. – is vital if transformative HE practices are to be developed and enacted on the scale required. However, as our analysis will set out, this alone will typically not be enough: in most cases, access to pedagogical resources is a necessary but insufficient condition for developing and enacting the transformative education that the crisis demands. Real progress depends on ensuring that HE educators have genuine opportunities to incorporate these approaches, techniques and resources into their day-to-day practice. It also requires greater recognition that the diversity of disciplinary, institutional and national contexts makes replicating 'best practice' across HE sectors a significantly more complicated challenge than can be addressed by merely sharing materials. As we elaborate, creating genuine opportunities for HE educators to teach the crisis means engaging with, and in some instances disrupting, the complex nexus of institutional and political structures which govern HE teaching practices, not to mention the epistemic and cultural dimensions of disciplines themselves. Greater understanding of the nature of the challenge is needed before widespread transformative practice can be developed and enacted.

This article contributes to this work by helping to conceptualise teachers' agency and opportunities to teach the crisis in contemporary HE. It investigates the genuine opportunities that educators have, or do not have, to teach the crisis in their day-to-day practice by drawing on the capabilities approach (CA), a philosophical and social scientific perspective that is grounded in conceptions of freedom, human flourishing and social justice. We use the CA as conceptual and methodological tool to help draw attention to the various structural factors – personal, social and material – that enable or impede educators from taking up these resources to support deep and critical understandings of the environmental crisis and promote meaningful responses through their practice. The significance of our contribution is two-fold. Firstly, we highlight the importance of developing nuanced understandings of HE educators' agency and capabilities to teach the crisis and the complex structural factors that mediate these capabilities. This understanding can help to explain how educators' agency is shaped by such factors, thereby providing a basis for evaluating existing policies, practices and institutional arrangements, and for arguing that significantly more activity is needed than the mere sharing of resources. Secondly, by centring the perspectives of educators, a CA-informed analysis can illuminate the potential diversity of beliefs, approaches and perspectives involved in 'teaching the crisis' in a way that supports the creativity and professional autonomy of educators to make situated judgements about how to teach transformative environmentally-oriented education. It also highlights the challenging nature of this work. We will return to develop these points in the penultimate section. For now, we will proceed by introducing the CA with support from a vignette of an imagined HE educator that grounds the CA in a practical example. Although empirical data about the capabilities of HE educators to teach the crisis is needed to advance our understanding (and is an endeavour that we are currently undertaking), this vignette is based on our reading of the academic literature, our interactions with colleagues and reflections on the challenges of developing our own practice. It is presented as an exemplar which we believe will be familiar to many HE educators.

3. Understanding educator's capabilities to teach the crisis: introducing the capabilities approach

Ali teaches in the business school of an HEI in England delivering undergraduate modules on microeconomics, financial practice and industrial organisation. She is increasingly concerned by the climate breakdown and biodiversity loss and aware that the economic theories and methods she teaches are at the heart of systems of economic production and consumption that are driving these problems. Ali knows that many of the prevailing paradigms in classical and neo-classical economics which inform her teaching pay scant regard to the environmental crisis (if it is mentioned, the 'environment' is treated as an externality which can be discounted) and has been exploring the possibility of incorporating perspectives from heterodox economics and degrowth perspectives into her teaching. She has accessed a number of online pedagogical resources by the Doughnut Economics Action Lab, including reading lists, seminar activities and alternative forms of assessment which she is keen to include in her modules, and has been inspired by economists working in a Canadian university where movements towards ecolonization and environmental justice have produced novel and innovative approaches to business education.

During the summer break Ali is preparing her modules for the coming academic year. After speaking to colleagues and reflecting on her teaching, Ali feels uncertain and reluctantly decides that she is unable to change her practice for a number of reasons: she is required by her faculty to deliver core topics and material in her modules in alignment with expectations of her peers, and with external examiners, which leaves little room for novel and 'alternative' perspectives, many of which contradict core aspects of the content matter she is required to deliver; Ali's senior departmental colleagues view heterodox economic perspectives with suspicion and as unworthy of inclusion in core modules on business and finance courses, and she fears that their inclusion could jeopardize her hopes of succeeding in the forthcoming academic promotion round; Ali is worried that introducing material that explicitly includes political and value judgements may lead students to question her credibility as a teacher and affect her scores in the teaching evaluation survey in which her performance is monitored; given significant workload pressures Ali feels she lacks sufficient time to redesign her teaching practice; Ali discovers that in order to be consistent with the module descriptions advertised to students her department require any changes to her modules' learning aims, curricula and assessment tasks to be submitted for approval via a lengthy bureaucratic processes, with the deadline long since passed; and finally, Ali is aware that room allocations have been made for the forthcoming semester, and that finding appropriate spaces that will accommodate small group discussions or active pedagogies amongst her large undergraduate cohort will be extremely difficult.

Ali feels deeply frustrated. She remains interested in developing alternative approaches to her teaching but feels she lacks the ability to do so. Ali concludes that she is not in a position to change her practice without further support and therefore resigns herself to continuing to deliver the modules as they had previously been taught.

What can we say about the agency and opportunities that HE educators like Ali have to teach the crisis? What are the factors that shape the formation of such opportunities, and what might need to

be done to support HE educators to develop and enact transformative forms of environmental pedagogy in their practice? These are complex questions that are not easy to answer. For this reason, we apply the capabilities approach (CA) as our theoretical framework and to guide critical reflection. Here we also note that the CA can also act as a methodological tool to aid empirical investigation in this area.

Ingrid Robeyns describes the CA as 'a broad normative framework for the evaluation and assessment of individual well-being and social arrangements, the design of policies, and proposals about social change in society' (Robeyns, 2005: 94). The CA was developed by the Nobel Prize winning philosopher-economist Amartya Sen in response to what he saw as the limitations of prevailing conceptions for measuring well-being, equity and quality of life (particularly classical and neoclassical economics, utilitarianism and Rawlsian political philosophy) which he argued revealed little about the lives and freedoms of individuals and groups (Sen, 1999, 2009). Rather than focusing on the goods, resources and commodities a person has access to or the things they may be able to achieve, the CA seeks to understand what people can *do* and *be* in their lives, and the freedoms they have to achieve those things which they value. The CA has become embedded across a wide variety of fields and disciplines, contributing novel insights within philosophy, economics, the broader social sciences and has been applied to the evaluation and design of policy and practice, especially in the fields of international development (Nussbaum, 2011; Stewart et al., 2018), healthcare (Venkatapuram, 2013; Entwistle et al., 2016) and education (Saito, 2003; Walker, 2005). While initially concerned with questions of human well-being and social arrangements, the capabilities approach has subsequently been applied to concerns about ecological integrity (Schlosberg, 2012), animal rights (Nussbaum, 2023) and multispecies justice (Cripps, 2022). Thus, it has the potential to prompt reflection about how we can learn to live well together with non-human species and ecosystems in the context of the environmental crisis, and how we might promote opportunities for ecological kinship with other species (for example see Dunkley, 2023).

For our purposes, the CA provides a framework for investigating the agency of individual HE educators (or groups of HE educators), taking into account their experiences, beliefs, ambitions and values, and for understanding their agency in the context of the particular material and social circumstances in which they are situated. Key to this perspective is the distinction made by the CA between a person's access to resources and the real opportunities, or capabilities, this person has (or does not have) to act as a result, and what this means for the 'functionings' they can achieve. The CA defines functionings as the valuable activities and states – the doings and beings of a person's life – that are central to their well-being (for example, the state of being well-nourished, or of being a teacher). By contrast, capabilities are the freedoms and opportunities a person has to achieve particular valued functionings (for instance, the opportunities a person has to eat if they wish to, or to fulfil an ambition to become a teacher). The vignette above can help to illustrate this distinction: Ali does not have the capability to change her pedagogical practice and achieve the valued functioning of teaching the crisis despite being highly motivated and having access to the educational resources which suggest how this might be done. The reasons for this are complex but include a range of factors which affect Ali's ability to convert this resource access into genuine opportunities to teach the crisis. To use the language of the CA, the circumstantial 'conversion factors' which constitute Ali's institutional and professional context limit her capabilities to develop new forms of teaching. These factors include social and environmental factors like institutional culture, bureaucratic regulations, epistemic and scientific norms within her discipline, interpersonal and professional relationships, student expectations, and so forth. The opportunities that Ali has are determined not only by her access to resources, but also by other myriad conversion factors which shape her capabilities to achieve the functioning of teaching the crisis in her day-to-day practice.

The CA does not suggest that capabilities are the *only* thing that matter. Rather, it suggests that factors like the distribution of resources or institutional procedures make particular capabilities possible, and the achievement of functionings – like education itself – provides the grounds for future capabilities opening up. The key point is that according to the CA it is capabilities that should be treated as the primary unit of analysis. The benefits of this are three-fold. Firstly, focusing on capabilities draws attention to the diverse structural circumstances in which people are operating. For instance, it might be relatively easy for Ali's colleague Runa to teach the crisis at the same institution given her position teaching human geography with colleagues in a department that is committed to promoting critical thinking about environmental issues. Unfortunately, Ali does not enjoy such amenable disciplinary or departmental conditions. Understanding Ali's agency as mediated by challenging structural factors provides a basis for developing a nuanced explanation of how (and why) her opportunities are formed and, in this case, circumscribed. Indeed, the CA can provide a means of understanding the (unequal) distribution of opportunities across society, helping to explain why some people, as individuals or groups, appear to enjoy opportunities that others do not. In so doing, it can also provide a means of evaluating and critiquing the structural conditions (including, for instance, policies, practices and institutional arrangements) that underpin the distribution of agency.

Secondly, the CA recognises that a person's capabilities are not simply shaped by their structural circumstances and factors external to them, they are also mediated by the person themselves, by their beliefs, values, dispositions, talents and choices. Analysis must account for the idiosyncratic and personal dimensions of each case. For example, Ali's awareness of the depth of the environmental crisis leads her to make a resolution to integrate this into her teaching, but her lack of support undermines her resolve, resulting in a belief that it will be too difficult for her to achieve in practice. Others may interpret their own situation differently, and have different levels of awareness, expertise and contrasting values and motivations in relation to the crisis. The CA encourages an understanding of peoples' capacity to be active and creative agents, including of their own capability development, while recognising that this agency will be influenced by a variety of factors, including social structures and relationships.

Thirdly, the CA is committed to value pluralism, which recognises that more than one thing matters, and that reasonable people may disagree about what this is. A CA-informed stance would resist overly prescriptive approaches to teaching about the environmental crisis and instead encourage HE educators to reflect (individually and collectively in communities of practice) critically and carefully about what matters in their teaching, and how they can foster the same critical reflexivity in their students. Promoting such pluralism seems particularly important when pedagogy becomes oriented towards social transformation and bound up with political and ethical

judgements, and in order to resist the dangers of indoctrination whereby students are taught what to think and how to live, rather than how to think critically about living well together in the unfolding crisis (Jickling and Wals, 2008; Bangay and Blum, 2010).

In summary, it is worth underlining the relationality of the CA as a framework for conceptualising agency as mediated by a wide variety of factors and conditions, including networks of culture and structures of power. Owens et al. summarise the relational dimensions of the CA in these terms:

> Capabilities are the genuine freedoms, opportunities, or causal powers that a person has to be or do things. They emerge from, and can be either sustained and strengthened or diminished or lost over time as a result of complex interactions between the person's own interpretations and actions and the dynamic nexus of material and social structures within which they live their lives. A person's power or agency to influence their own interpretations and actions, and to some extent the situations and relationships in which they are embedded, is itself a product of the complex multitude of causal mechanisms that constitute the person and their environment. Their agency can also be said to depend on, or be part constituted by, some of their particular capabilities. And particular capabilities can both contribute to and be supported by other capabilities. (2022: 100)

Recognising the relationality of agency in this way makes the CA compatible with a number of research traditions and approaches, not least critical theory, feminist and decolonial perspectives. Such approaches underscore the need to understand agency as mediated by political and cultural structures of power associated with capitalism, gender inequality and the legacies of colonialism, respectively. As Owens et al. (2022) make clear, the relational dimensions of the CA also make it potentially compatible with complex systems theory, itself a key perspective for understanding the environmental crisis, its causes and its potential remedies.[2] From this relational perspective, the discussion below examines some of the important personal, material and social conversion factors which affect the agency of HE educators and shape their capabilities to teach the crisis.

4. Factors affecting the capabilities of higher education educators to teach the crisis

The agency of educators is relational, meaning it is shaped by a complex array of factors (Molla and Nolan, 2020). In this section we draw on the CA alongside the extant academic literature and Ali's story, to reflect on salient personal, material and social conversion factors affecting HE educators' capabilities to teach the crisis. For clarity, our discussion follows the CA's analytical distinctions between these

three groups of factors, but we readily acknowledge that many of the factors will overlap and/or span these groupings. We will particularly focus on examining the influence that social conversion factors have on HE educators' capabilities to teach the crisis; factors that tend to be overlooked given their status as intangible and complex social entities which can be hard to observe and analyse and have a propensity to generate inconvenient questions. Our aim is to recognise and affirm those factors which open up opportunities for HE educators to develop and enact critical and transformative environmental pedagogies, and to highlight factors which act as barriers to doing so. This discussion is offered as a tentative outline to inform the necessary empirical work of testing and potentially validating the points made above. By providing examples of the sorts of factors that shape the capabilities of HE educators to teach the crisis it offers a more substantive account of the structural formation of HE educators' agency, as well as an indication of which factors might be generalisable and/or context specific.

4.1. Personal conversion factors

As set out above, personal factors affecting the capabilities of educators to teach the crisis might include a person's beliefs, dispositions, attributes and characteristics. Personal conversion factors which support opportunities to teach the crisis may include (but are certainly not limited to) the following: an educator's knowledge and awareness of the crisis (including specific aspects and the broader context in which it is situated and through which it has emerged); their confidence and competence to incorporate the crisis into their existing teaching; and their inclination and motivation to find ways to embed the crisis in their teaching practice. It will be important to take into account the complexity of intrapersonal dynamics, and the significant scope for interpersonal variability: in Ali's case her knowledge and awareness of the crisis and motivation to respond is somewhat hampered by her limited sense of agency, but as we have noted this may not be true of others in similar positions.

Molla and Nolan use the terms 'inquisitive agency' to refer to the 'specialist knowledge and skills' educators require in order to be able to execute their work and 'deliberative agency' as the capability to 'critically reflect on one's practices and on theories and assumptions that inform the practices' (2020: 72–3). Exhibiting deliberative agency involves critically evaluating one's own (and indeed others') teaching practice to consider how it might be developed and improved. Both inquisitive and deliberative agency are of central importance to educators' capabilities for pedagogical innovation. Developing ways of teaching the crisis requires core skills and specialist knowledge that straddle disciplinary traditions, and without structured time for deliberation and opportunities for peer observation and discussion, educators may lack opportunities to think about the relevance their work has to the environmental crisis or to imagine how they can respond. For instance, it may never occur to educators that they might: teach their students outside of traditional classroom settings; move beyond the standard lecture/seminar/laboratory format; develop non-standard forms of assessment other than exams and essays; include opportunities for affective, alongside cognitive, responses to stimuli; incorporate current events into their teaching; and bring in external partners and guest speakers. These possibilities depend on a range of other (material and social) factors, but in general, educators' capabilities to teach the crisis will be supported by greater knowledge,

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2   Further research is required to understand the potential for using complex systems analysis to understand and promote social transformation in response to the environmental crisis. However, following the analysis of Meadows (1999) it may be that embedding critical and transformative environmental education across HE represents a key 'leverage point' through which social change may be accelerated.

confidence, competence and support for motivation, imagination, deliberation and reflection.

Support to develop personal conversion factors that enable individual educators to teach the crisis will be an important objective for HEIs. While data concerning the preparedness of HE educators to teach the crisis is limited, there is evidence in England that high proportions of school teachers feel inadequately trained to do so (Teach the Future, 2021; Greer et al., 2023b). What seems clear is that it cannot be assumed that every HE educator will be on an equal footing when it comes to their engagement with or concerns for the environmental crisis. Indeed, some educators may be unaware of the scale and depth of the crisis, others might be disinclined to make changes, and/or others may offer reasons why they believe it is not appropriate for them to change their practice. The degree of confidence (or perhaps courage?) that educators have to seek to implement transformative forms of pedagogy may, quite reasonably, vary given the differing positions that educators find themselves in. Many educators will no doubt feel they lack the subject knowledge required to design and enact new forms of pedagogy, or indeed that attempting to teach the crisis could expose the limitations of their knowledge and pedagogical abilities. This is a substantial issue that can only partly be addressed through access to pedagogical resources and support, especially as subject knowledge, mediated by perceptions of experience, is closely linked to confidence and self-efficacy (Bandura, 1997). There is also the question of developing the pedagogical techniques, competencies and skills required to teach sensitive and emotionally challenging issues associated with the environmental crisis, especially those associated with loss and damage, injustice and/or catastrophic risk. Such teaching requires interdisciplinary engagement across a broad range of topics, incorporating critical, normative and political perspectives and challenging emotional engagement, and this can be demanding of even the most experienced and skilled educators (Finnegan, 2022). Indeed, for many HE educators a key challenge may be dealing with their own negative emotional responses to the crisis (including for example feelings of fear, grief and loss) and channelling this positively into their teaching (see for example Verlie, 2022). Finding the means to navigate this emotional labour and to cope with potential discomfort and disagreement in classrooms, as well as the possibility of uncertainty, disappointment or even failure should students, or indeed colleagues, react negatively to the novel pedagogies being introduced is highly skilled and demanding work.

4.2. Material conversion factors

Alongside personal factors, a range of material factors will shape the capabilities of HE educators to teach the crisis. Material conversion factors might ordinarily be understood in terms of the environmental surroundings, physical infrastructure, facilities, and goods, commodities and various other resources that shape educators' opportunities. This draws attention to the local geography of and infrastructure on campus, as well as access to the books, technologies, classrooms, laboratories, field trips and any other pedagogical resources which may be required for education to take place. Ali's case illustrates the types of constraints that can be encountered when trying to introduce creative pedagogies into inflexible HE learning spaces, especially where limits are imposed by factors like the size of rooms or the type of furniture present. Alongside consideration of material resources and teaching spaces, there is growing consideration

about the importance of the 'places' where education occurs, for example in the academic literature on 'place based learning' for environmental education (e.g., Ayotte-Beaudet et al., 2017) that highlights the relationship between modes of pedagogy and the natural world. Further, indigenous knowledge and practice is often steeped in cultivating a connection to and valuing of place and land, while the pioneering educational approach of wild pedagogy aims to re-orient learners with 'wild places', 'nature', and non-human beings, and by moving learning outdoors and into less managed spaces so that 'the places we visit to become an integral part of our work' (Morse et al., 2018: 241). While some HEIs will be located on campuses which afford learners access to green spaces or to less managed environments and, thus, ready opportunity for connecting with non-human species and ecosystems, many HEIs are located within highly urbanised environments without such access. While urbanised environments may afford some pedagogical opportunities (for example, they may be instructive settings to discuss certain technological responses) they might be perceived to limit what is pedagogically possible for teachers. Either way, location, physical environment and access to 'wild' and 'natural' places can be treated as a material conversion factor affecting the capabilities of HE educators to teach the crisis.

As already established, access to appropriate pedagogical resources is also a necessary condition for educators to have opportunities to teach the crisis. Such resources can have a transformative effect on the possibilities for educational practice and they should continue to be developed and shared across disciplinary and institutional contexts. We have argued that new pedagogical approaches must not reproduce the forms of knowledge and pedagogy that have led to this current state of emergency. Therefore, it is important that educators can access resources that draw on decolonial, feminist, indigenous, heterodox and eco-centric perspectives. With this in mind, it seems likely that forms of professional development and dynamic relationships of pedagogical support (which we acknowledge could also be classed as a social conversion factor, see below, and which will clearly impact on personal conversion factors) will be important for supporting educators' agency (Imants and Van der Wal, 2020). This might take many forms, ranging from local departmental or institutional support to large scale global networks of peer-to-peer learning and knowledge exchange (such as Faculty for a Future).

4.3. Social conversion factors

The discussion of personal and material conversion factors above points to a related set of social factors that affect the capabilities of HE educators to teach the crisis, particularly institutional arrangements, cultures and working conditions. For instance, institutional discourse can have an indirect influence on the agency of HE educators by establishing the context in which pedagogy is maintained and developed. To create a permissive context that supports educators' agency to teach the crisis it will be important that senior management at HEIs 'set the tone' by recognising the seriousness of the environmental crisis, articulating institutional obligations and ambitions and by putting in train meaningful action for their realisation. Public statements that recognise the seriousness of the environmental crisis and pledge institutional commitments to support societal transformation (such as those that accompany HEIs' declarations of a 'climate emergency', or their involvement in the United Nations Environment Program's 'Race to Zero' campaign) can

be helpful where they set an agenda and establish the socio-cultural context within which educational priorities, policies and practices are developed. Forms of critical and transformative environmental pedagogy can often align with institutional mission statement (which, in many cases, seek to promote public good and encompass aspects of education, research, service to communities) and may thus be seen as a means of enacting institutional priorities. Moreover, public statements that make environmental commitments can help to reinforce institutional responsibilities, and generate a level of accountability. For example, the greening of institutional operations has both intrinsic and symbolic value, sending positive signals to staff, students and external stakeholders that institutions are upholding their obligations and taking action to address the environmental crisis. However, Latter and Capstick identified a tendency amongst UK universities to 'use declarations as publicity and promotional material' (Latter and Capstick, 2021: 1) while O'Neill and Sinden characterise some HEIs activities and pronouncements on sustainability as 'boosterism' deployed for reputational purposes (2021: 35). In view of this, it is clearly important that such statements do not operate simply as performative rhetoric and that they are accompanied by meaningful and substantive action.

It will be particularly important that HEIs recognise, value and promote the work that educators do to develop pedagogies which teach the crisis. Rather than Ali fearing being penalised in academic promotion or being criticised for scoring poorly in students' evaluations of her teaching, she might be motivated by the knowledge that her attempts to trial new pedagogies and introduce alternative perspectives would be acknowledged by her colleagues and evaluated in a supportive peer-environment. Molla and Nolan describe the importance of 'recognitive agency' (2020, 74) for supporting the capabilities of educators, suggesting that recognition from senior colleagues and management for the value of the work educators undertake can support their autonomy, particularly in terms of enhancing their morale, motivation and confidence. This again underlines the importance of management cultures in HE that 'get' the seriousness of the crisis and the urgent need for an educational response across HE. It also illustrates how HEIs' policies and practices are a salient form of social conversion factor that interrelate with personal conversion factors and affect educators' broader capabilities to teach the crisis. Leadership and management across HE will need to carefully consider how their behaviour, and the broader institutional context (including forms of educational culture, recognition, professional development, support for innovation and administrative processes and frameworks) will influence for better or worse educators' agency. This matters because there is likely to be considerable uncertainty from many educators about how critical engagement with the environmental crisis (and the complex political and ethical questions this raises) could be integrated into their teaching, especially in supposedly 'non-aligned' disciplines (for example, in classics or linguistics). Support might include targeted forms of pedagogical advice, professional development and/or the creation of communities of practice and networks of knowledge exchange to help educators understand the relevance of the environmental crisis to their discipline and to develop appropriate and effective pedagogy aligned with existing curricula (Sibbel, 2009). In addition, bureaucratic assistance may be needed, perhaps most importantly the allocation of time to develop and test novel pedagogical approaches. If educators are to develop critical and effective forms of pedagogy which are transformative in nature and

commensurate with the depth and complexity of the crisis, they will need time and space to think and plan.

At present, many HE educators may feel that embedding the crisis in their teaching is beyond what is possible for them, particularly where their time is already highly pressured and unmanageable workloads are endemic across the HE sector [as is the case in the United Kingdom (University and College Union, 2022) and elsewhere (Miller, 2019; Haven et al., 2020)]. A key variable in this respect will be how leadership and management of HEIs' respond, and whether they will be prepared to act in support of educators' agency to develop and enact novel forms of critical and transformative environmental pedagogy. Corporate management approaches have become commonplace in HEIs around the world over the last decades, and reductions in public funding, globalisation and the rise of neo-liberal governance strategies have led HEIs to become more competitive and business oriented (McGeown and Barry, 2023). Kenny and Fluck describe an international trend in HEIs that produces a 'strong focus on efficiency, productivity and accountability' (Kenny and Fluck, 2022: 1371) and which may limit the time and space afforded to educators to develop and implement novel pedagogical approaches. Education in HEIs has been described as increasingly subjected to neoliberal reforms and application of 'top-down' new public management techniques (Ferlie et al., 2008; Broucker and De Wit, 2015) which include strict use of quantitative data and metrics to evaluate educators, measure student experience and satisfaction and to rank performances of educators, programmes and institutions (Cribb and Gewirtz, 2013; Dougherty and Natow, 2020). Within HEIs, as across education more widely, the prevailing techniques and pressures of the neoliberal policy regime has curtailed the professional autonomy of educators (Molla and Nolan, 2020). Amongst other things, it seems likely that some reconsideration of the pervasive model of top-down and tightly regulated management regimes across HE will be needed to support educators' agency to develop and enact innovative, transformative environmental pedagogies, and for these to proliferate across the sector.

Broader cultural and institutional attitudes and agendas concerning the crisis are important social factors influencing HE educators' agency. For example, recognition of the threat to health posed by climate breakdown and calls for urgent change expressed by leading medical organisations (Atwoli et al., 2021; WHO, 2021) can positively contribute to a culture where social transformation is seen as necessary and desirable. Of course, collective action, organising and activism concerning the crisis exist already in many forms across HE, from students' campaigning[3] to trade union activities.[4] There is also evidence that a growing number of HE students want to learn more about the crisis (SOS, 2022). However, where novel pedagogies significantly disrupt existing teaching patterns and/or run counter to the expectations and supposed interests of those within HE (including students, academic staff, managers, etc.) and beyond it (e.g., corporations, employers' organisations, politicians, regulators, professional bodies, etc.) the agency of educators may be impeded. For instance, where influential stakeholders are unsympathetic or indeed hostile towards approaches to environmental education which are explicitly political, critical and transformative [as may be the case with the UK government's demands for conservative and apolitical

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3   https://www.sos-uk.org

4   https://www.ucu.org.uk/environment

approaches to environmental education in schools (Glackin and King, 2020) or where education is being directed towards promoting the interests of fossil fuel corporations (Tannock, 2020)] it may be extremely difficult for educators to enact changes.

Similar difficulties may be experienced by educators working in HE disciplines which have canonical curricula, as illustrated in Ali's story, and where there are strong expectations that epistemological and methodological norms and pedagogical conventions are respected and reproduced. This will of course vary across disciplinary contexts: in some disciplines discussing the political, social and/or ethical dimensions of the crisis might complement existing approaches, but in others such discussions might feel unfamiliar, inappropriate and/or beyond the bounds of knowledge or concern. For instance, within scientific disciplines with a strong tradition of positivist methodologies and epistemologies there may be resistance to incorporating the political, cultural and normative dimensions of the environmental crisis into teaching practice, elements we believe are essential to understanding the complexity and uncertainty of the crisis and developing the critical and transformative pedagogies that are needed.[5] Teaching the crisis may place demands on educators to move into uncomfortable spaces that transcend the boundaries of their discipline and challenge the norms and standards that govern their community of educational practice, at least as these have been typically conceived. A lively debate is already underway about such difficulties, with Gardner et al. (2021) contending that in the face of the unfolding crisis scientists and other researchers are obliged to abandon their supposedly 'neutral' and 'impartial' positions and adopt roles as academic advocates and activists. What is needed, therefore, are conditions which create opportunities for academics to discuss within communities of practice the implications and complex questions that the environmental crisis has for knowledge, methodologies, norms and conventions in their disciplines. Such opportunities might be found in 'set-piece' initiatives like colloquia at academic conferences or articles sharing experiences and best practice in journals and society publications. Perhaps more importantly such opportunities would be grounded in educators' routine interactions, for example, through discussion at departmental meetings, teaching forums, peer-observation, and within the 'organic' and informal exchanges which are part of day-to-day academic life. However, there is a danger that at a time when HEIs need to be supporting educators to develop innovative transformative forms of pedagogy, the prevailing institutional arrangements, organisational cultures and epistemic norms – what we might call the neoliberal structural conditions of contemporary academic life (McGeown and Barry, 2023) – are curtailing the agency of educators, leaving them stuck in conventional modes of teaching with scant opportunity to develop and enact ways of embedding the crisis in their teaching.

Given these challenges, it is perhaps unsurprising that, as established above, many HEIs elect to incorporate concerns about sustainability and the environment in specialist stand-alone modules that avoid detailed examination of the socio-political and/or ethical dimensions of the crisis. Such policies and practices can themselves be understood as curtailing HE educators' capabilities to embed the crisis in their teaching. If educators believe that environmental issues are being catered for by specialists elsewhere, they might view their responsibility to engage with these issues as being met by others and/or that it would be best to avoid any unnecessary repetition. Meanwhile, if prevailing institutional cultures typically construct 'the environment' and 'environmentalism' in reductive terms (e.g., by sticking closely to the paradigm of sustainable development) educators may feel unable to transcend this narrow framing to discuss more contentious topics, or indeed it may not even occur to them to do so. This point reflects the dominance of anthropocentric and capitalistic environmental discourses that permeates not just HEIs but the (largely Western/ised) societies of which they are a part (Washington et al., 2021). Shallow and piecemeal approaches to environmental education that provide HEIs with a rhetoric that assures that action is being taken and obligations are being met (despite these actions brushing over and, in some cases, obfuscating the structural causes of the crisis) can stymie educators' possibilities for developing and adopting deeper and transformative pedagogies that critically engage with the arrangements which have contributed to the crisis (O'Neill and Sinden, 2021).

We end this section with a brief but important point about the broader social factors shaping academic identities, experiences and agency and the importance of adopting an intersectional approach to any assessment of capability bearing in mind persuasive inequalities associated with identity and social position. As we have said above, the agency of educators is relational, and because HE educators' identities vary significantly, they will occupy different positions in relation to the demands of 'teaching the crisis'. For example, there is evidence that female academics tend to have greater teaching and administrative workload commitments than their male counterparts (Guarino and Borden, 2017; O'Meara et al., 2017; Cabero and Epifanio, 2021) and are typically in less senior academic positions (Aiston and Kent Fo, 2021). We also know that socio-economic class (Haney, 2015; Waterfield et al., 2019), race and ethnicity (Bhopal, 2016), disability (Olsen et al., 2020) and employment status (particularly in contexts of precarious employment and casualised contractual arrangements, see for example Crimmins, 2017) all affect the experiences and agency of academics working at HEIs. It is therefore important that any understanding of the conversion factors affecting the capabilities of HE educators to teach the crisis must be sensitive to the diverse identities and circumstances of educators themselves, and to the stubborn and pervasive influence of social inequalities, within and beyond the academy.

5. Enacting an educational strategy: diversity, deliberation and critical transformation

In this penultimate section we return briefly to our vignette to consider questions surrounding HEIs' enactment of an educational strategy for teaching the crisis, highlighting issues of deliberation, criticality and diverse forms of pedagogy which seem central to successfully enacting a critical and transformative educational strategy.

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5   Machado De Oliveira (2021) has argued that it is reductive and rationalistic approaches to epistemology (e.g., that separate facts and values and which silence and exclude marginalised communities) that has informed Western industrial progress throughout the modern period and which has helped to bring the crisis about.

The Dean for Education at Ali's university is proposing to implement a major educational initiative which will deliver teaching on 'environment and sustainability' to all undergraduate students. Given her interests in this area, Ali is invited by her head of department to join the working group tasked with developing the strategy for enacting this initiative. After lengthy discussion the working group settles on two possible options: the first proposes the development of a single new compulsory stand-alone module to be taken by all first year undergraduate students that provides an interdisciplinary introduction to 'environmental sustainability'; the second option is for a distributed and integrated approach that sees the university provide academic departments with support to embed the themes of environmental crisis and sustainability into their programmes' existing core modules.

The first option attracts considerable support within the working group, with its advocates arguing that it would be the simplest and least resource intensive way to incorporate environmental concerns across the university's undergraduate teaching because it would allow a small group of experts to deliver the content without disrupting existing taught programmes. It would also enable management to retain oversight of the emergent programme and to steer its development. However, Ali makes the case for the second option, giving four key reasons. Firstly, a stand-alone module risks becoming marginalised and devalued by staff and students, so if this topic is to be taught effectively, integration with specific disciplines and subjects will be preferable. Secondly, because the environmental crisis is relevant to education in all disciplines, a distributed and integrated approach is needed to provide departments with opportunities to meet their responsibilities while bringing their teaching 'up to date' with the unfolding crisis. Ali cites her own teaching in the Business School around financial accounting and management, explaining that decades of teaching neoclassical economics that treats environmental concerns as externalities have effectively reproduced forms of knowledge and culture which has played a key role in the development of the crises faced, and that there is a need for a change of economic paradigm if their teaching is going to be fit for purpose. Thirdly, a distributed and integrated approach has the potential to cultivate novel and diverse forms of pedagogy across the university which would be sensitive to the demands, standards and contexts of particular disciplines. Fourthly, this approach would be an opportunity to support the professional development and autonomy of colleagues as pedagogues. Ali suggests the university should create an expert-led service unit which can work with educational leads within departments to explore how the environmental crisis could be integrated within existing programmes, and could provide them with whatever advice, funding, resources and support that may be needed.

While Ali has some support from fellow academics within the working group, the Dean and other members of senior management favour the first option. Despite her representations for a distributed and integrated model garnering some support within the working group Ali is not confident that the pending vote on the initiative will go her way.

The vignette illustrates the potential that a distributed and integrated approach to embedding transformative environmentally oriented pedagogy across disciplines and programmes of HEIs could have, as well as problems that this approach might encounter along the way. Adopting a distributed and integrated approach would mean centring the agency of HE educators to develop and enact pedagogies for teaching the crisis in their specific disciplinary contexts. If HEIs

attend to the various factors that affect educators' agency and create supportive conditions for this work, this strategy could produce a profusion of novel pedagogical methods and approaches. Not only would this promote the professional development, autonomy and agency of educators, it could be broadly transformative for higher education itself, enabling, as Green suggests, HEIs to better fulfil their 'over-arching mission to humanity and the planet' (Green, 2021). Of course, it is by no means clear that HEI leaders would favour such a distributed and integrated approach, especially given the financial and institutional resources that may be required to implement it, and the relative simplicity and control afforded by offering stand-alone modules.

Those making decisions about educational strategy will need to engage in forms of deliberation and critical reflection about the forms of pedagogy deemed appropriate and how the inevitable plurality of perspectives, beliefs, interests and values may be managed. As such, a further advantage of adopting the CA in conceptualising educators' agency to teach the crisis is that it emphasises the importance of creating arrangements and practices which respect and promote freedom, value pluralism, democratic deliberation and participation while paying attention to the ways in which (personal, material and social) conversion factors will affect agency (Sen, 2009; Bonvin et al., 2018). This may prove particularly helpful for the development of distributed and integrated educational strategies which will need HE educators to deliberate and decide for themselves, in communities of practice, how the crisis should be taught in their particular institutional, social and disciplinary contexts. How, in practice, such deliberation takes place can be determined locally, but Sen's work emphasises the importance of democratic processes supported by egalitarianism, free participation and public reasoning (1999).

While endorsing this emphasis on deliberative democracy, we do, however, argue that this and the development of pedagogy more generally, must be conducted with regard for the full nature, extent and depth of the environmental crisis we face. While educators should be free to decide together what and how to teach, the pedagogies adopted should be commensurate with the scale of the crisis and must provide opportunities for a deep and critical engagement with its social, political and ethical dimensions. As Kopnina (2020) suggests, this may lead educators to consider incorporating critical perspectives and non-standard pedagogies which are ethically and epistemologically open to non-Western knowledge and culture and ecocentric values. For example, they may draw on indigenous knowledge, local and traditional forms of learning as well as heterodox economic perspectives and notions of multispecies justice and kinship, putting ecological concerns before the interests of humans and capital (for example see Taylor and Pacini-Ketchabaw, 2015 and Dunkley, 2023). Such pedagogies could promote opportunities for participants to imagine alternative economic, political and ecological futures. Indeed, they could create fertile ground for deep and radical forms of learning to occur, those required for the social transformation needed to mitigate the most severe consequences of the environmental crisis.

Introducing critical and transformative pedagogies may prove challenging for staff, students, administrators, managers, and those already working within environmental and sustainability roles with HE and beyond. O'Neil (2021: 1) has characterised the relatively fixed nature of economic, administrative and faculty structures in HEIs in

terms of 'institutional fragility' which acts as a barrier to HEIs contributing meaningfully to a sustainable future. Of course, pursuing critical and transformative educational strategies could be controversial because of their potential to disrupt existing administrative processes and institutional priorities, and for challenging dominant constructions of knowledge and prevailing structures of power that this knowledge supports. For example, in our vignette Ali's disagreement with her departmental colleagues about the need to introduce heterodox in place of neoclassical economics, and her advocacy for a distributed and integrated pedagogical approach in contrast to the views of her Dean, illustrates the sorts of disagreements and disruption that may be experienced across departments and institutions. As well as requiring additional pedagogical and administrative labour, in many cases, changes will involve confronting the dominance of neoliberal politics and cultures of Western Modernity, within HE and across broader society. Doing so will entail challenging constructions of 'the environment' and 'environmentalism' in ways that are compatible with continued economic expansion, market fundamentalism and the continued dominance of human beings over animals and ecosystems (Hatzisavvidou, 2020; Machado de Oliveira, 2021; Greer et al., 2023a). Such confrontation might be expected given that the task at hand is to develop forms of education that are capable of responding to an anthropogenic environmental crisis that has its root causes in centuries of capitalist and colonial power (Sultana, 2022). That HEIs, in the United Kingdom and globally, have typically developed within and continue to serve these same structures of power will perhaps make conflict unavoidable. However, understanding and addressing the crisis is an inescapably political endeavour. Teaching the crisis cannot be a neutral, apolitical business: it will inevitably involve understanding and confronting vested interests and the central role of economic, social and political power that have caused the crisis, including hegemonic epistemologies, cultures and discourses that operate within and across HE (Stoddard et al., 2021). As Kopnina (2016: 146) points out 'Anthropocentric hegemonies will not allow space for dissent unless we create it', and the critical and transformative education that the crisis demands will need to be ready to confront entrenched interests and dominant forms of power, within the academy and beyond.

6. Conclusion

Further research is urgently needed to support knowledge and understanding in this area. We are in the process of undertaking empirical research with HE educators and students to illuminate the challenges of and possibilities for developing and enacting critical and transformative ways of teaching the crisis across HE institutions and disciplines. For now, it is clear that HEIs have a responsibility to develop their educational provision in ways that will support the social transformation needed to mitigate the worst effects of the environmental crisis, and while the agency of HE educators is central to this it must not be taken for granted. As we have argued, promoting opportunities for HE educators to develop and enact critical and transformative environmental pedagogy in their day-to-day teaching practice is a complex business mediated by a variety of (personal, material and social) factors. It involves negotiating conflict, and understanding and confronting entrenched structures of power, from the local and institutional to the national and global.

It is positive to see HEIs making commitments and pledges to respond to the environmental crisis, and the proliferation of pedagogical resources and growth of networks and capacity building initiatives is similarly to be welcomed. Nevertheless, we must question whether these developments are sufficient for progress, and why it is that it is still so challenging for HE educators to embed the environmental crisis in their teaching. To gauge the progress HEIs are making in this area we suggest a single practical question can be asked of their commitments, actions or initiatives: how far does it help to create genuine opportunities for educators to teach the crisis in a critical and transformative manner, and what else may be needed for it to do so? This question prompts critical reflection about what is really needed from HEIs. Professed concern and ambition from HEIs about the crisis, encouraging rhetoric from management and enhanced access to pedagogical resources are all important but will often not be sufficient to enable educators to develop and enact the critical and transformative pedagogies that are needed. Greater attention must be paid to the complex combination of factors which mediate HE educators' agency and which make teaching the crisis more or less possible for them. In particular, alongside personal and material factors, close critical attention must be paid to the role that social factors have in shaping educators' opportunities, especially to epistemic and disciplinary norms, institutional policies and practices, and the broader formations of culture and power that structure HE.

As our analysis has demonstrated, the CA can help to guide understanding and action in this area. As well as supporting conceptual insights, the CA can guide much needed empirical inquiry about the extant opportunities HE educators have to develop and enact critical and transformative environmental pedagogies, how these opportunities are formed and structured, and their experiences of attempting such work. As a starting point, the CA provides clarity about the distinction between educators' access to pedagogical resources and their capabilities to teach the crisis in their day-to-day practice. Moreover, by highlighting the complex (and somewhat overlooked) factors that mediate HE educators' agency the CA can illuminate the scale of the challenge faced, and the importance of anticipating and finding ways to address political challenges bound up with power structures within and beyond the academy. Of course, there is a significant amount of work to do (beyond the scope of this paper) to identify and develop pathways for successful action. How these challenges can be overcome is an open-ended question which will vary depending on local circumstances. There is, however, much to learn from the experiences and efforts of educators who have been engaged in promoting decolonial, anti-racist, feminist, queer and heterodox curricula and pedagogies across HE. Since these movements are based on critical perspectives which disrupt HE's status quo, analysis of the opportunities and challenges that these educators have experienced and continue to face may be instructive for understanding the agency HE educators have to teach the environmental crisis. There will also be much to draw on from these movements that informs the substantive content and pedagogical methods of critical and transformative environmental pedagogies across HE. In all cases it will be essential to engage in and promote critical thinking about environmental concerns, and to foster in students the practical skills, know-how and collective agency to help enact social

transformation (Hodson, 2014). Developing and enacting critical, transformative environmental education across teaching programmes is likely to be difficult, but it offers HEIs an opportunity to meet their responsibilities and renew their fundamental purpose, and is central to supporting the deep societal transformations that the environmental crisis demands.

Data availability statement

The original contributions presented in the study are included in the article further inquiries can be directed to the corresponding author.

Author contributions

All authors contributed to conception of the study, composed and refined the analysis, and contributed to the processes of drafting and manuscript revision. All authors have read and approved the submitted version.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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References

Aiston, S. J., and Kent Fo, C. (2021). The silence/ing of academic women. *Gend. Educ.* 33, 138–155. doi: 10.1080/09540253.2020.1716955

Alcántara-Rubio, L., Valderrama-Hernández, R., Solís-Espallargas, C., and Ruiz-Morales, J. (2022). The implementation of the SDGs in universities: a systematic review. *Environ. Educ. Res.* 28, 1585–1615. doi: 10.1080/13504622.2022.2063798

Altbach, P. G., and Knight, J. (2007). The internationalization of higher education: motivations and realities. *J. Stud. Int. Educ.* 11, 290–305. doi: 10.1177/1028315307303542

Atwoli, L., Baqui, A. H., Benfield, T., Bosurgi, R., Godlee, F., Hancocks, S., et al. (2021). Call for emergency action to limit global temperature increases, restore biodiversity, and protect health. *Br. Med. J.* 374:n1734. doi: 10.1136/bmj.n1734

Ayotte-Beaudet, J.-P., Potvin, P., Lapierre, H. G., and Glackin, M. (2017). Teaching and learning science outdoors in schools' immediate surroundings at K-12 levels: a Meta-synthesis. *Eurasia J. Math. Sci. Technol. Educ.* 13, 5343–5363. doi: 10.12973/eurasia.2017.00833a

Bandura, A. (1997). *Self-efficacy: the exercise of control*. New York: Freeman.

Bangay, C., and Blum, N. (2010). Education responses to climate change and quality: two parts of the same agenda? *Int. J. Educ. Dev.* 30, 359–368. doi: 10.1016/j.ijedudev.2009.11.011

Bessant, S. E. F., Robinson, Z. P., and Ormerod, R. M. (2015). Neoliberalism, new public management and the sustainable development agenda of higher education: history, contradictions and synergies. *Environ. Educ. Res.* 21, 417–432. doi: 10.1080/13504622.2014.993933

Bhopal, K. (2016). *The experiences of black and minority ethnic academics: a comparative study of the unequal academy*. London and New York: Routledge.

Bonneuil, C., and Fressoz, J. B. (2016). *The shock of the Anthropocene: the earth, history and us*. London: Verso.

Bonvin, J. M., Laruffa, F., and Rosenstein, E. (2018). Towards a critical sociology of democracy: the potential of the capability approach. *Crit. Sociol.* 44, 953–968. doi: 10.1177/0896920517701273

Bradshaw, C. J. A., Ehrlich, P. R., Beattie, A., Ceballos, G., Crist, E., Diamond, J., et al. (2021). Underestimating the challenges of avoiding a ghastly future. *Front. Conserv. Sci.* 1:615419. doi: 10.3389/fcosc.2020.615419

Broucker, B., and De Wit, K. (2015). New public Management in Higher Education. In: J. Huisman, De Boer, H., D. D. Dill and M. Souto-Otero (eds) *The Palgrave international handbook of higher education policy and governance*. Palgrave Macmillan, London.

Cabero, I., and Epifanio, I. (2021). A data science analysis of academic staff workload profiles in Spanish universities: gender gap laid bare. *Educ. Sci.* 11:317. doi: 10.3390/educsci11070317

Cribb, A., and Gewirtz, S. (2013). The hollowed out university? a critical analysis of changing institutional and academic norms in UK higher education. *Discourse: Stud. Cultural Politics Educ.* 34, 338–350. doi: 10.1080/01596306.2012.717188

Crimmins, G. (2017). Feedback from the coal-face: how the lived experience of women casual academics can inform human resources and academic development policy and practice. *Int. J. Acad. Dev.* 22, 7–18. doi: 10.1080/1360144X.2016.1261353

Cripps, E. (2022). *What climate justice means and why we should care*. London: Bloomsbury Continuum.

Dougherty, K. J., and Natow, R. S. (2020). Performance-based funding for higher education: how well does neoliberal theory capture neoliberal practice? *High. Educ.* 80, 457–478. doi: 10.1007/s10734-019-00491-4

Dunkley, R. (2023). Ecological kin-making in the multispecies muddle: an analytical framework for understanding embodied environmental citizen science experiences. *Trans. Inst. Br. Geogr.*, 1–16. doi: 10.1111/tran.12613

EAUC. (2019). Sustainability in education 2018-19. EAUC; National Union of students; University and College Union; Association of Colleges; College Development Network. Available at: https://uploads-ssl.webflow.com/6008334066c47be740656954/606f18bb9ee4 0f3e3aa2906f_20190319_State%20of%20the%20sector%20report%202018_FINAL.pdf

Eckersley, R. (2016). "Responsibility for climate change as a structural injustice" in *The Oxford handbook of environmental political theory*. eds. T. Gabrielson, C. Hall, J. M. Meyer and D. Schlosberg (Oxford: Oxford University Press)

Entwistle, V., Cribb, A., and Owens, J. (2016). Why health and social care support for people with long-term conditions should be oriented towards enabling them to live well. *Health Care Anal.* 26, 48–65. doi: 10.1007/s10728-016-0335-1

Facer, K. (2020). Beyond business as usual: Higher education in the era of climate change. Higher Education Policy Institute. Available at: https://www.hepi.ac.uk/2020/12/10/beyond-business-as-usual-higher-education-in-the-era-of-climate-change/

Ferlie, E., Musselin, C., and Andresani, G. (2008). The steering of higher education systems: a public management perspective. *High. Educ.* 56, 325–348. doi: 10.1007/s10734-008-9125-5

Finnegan, W. (2022). Educating for hope and action competence: a study of secondary school students and teachers in England. *Environ. Educ. Res.*, 1–20. doi: 10.1080/13504622.2022.2120963

Gardner, C. J., Thierry, A., Rowlandson, W., and Steinberger, J. K. (2021). From publications to public actions: the role of universities in facilitating academic advocacy and activism in the climate and ecological emergency. *Front. Sustain.* 2:679019. doi: 10.3389/frsus.2021.679019

Glackin, M., and King, H. (2018). *Understanding environmental education in secondary schools in England: Report 1: Perspectives from policy*. London: King's College London

Glackin, M., and King, H. (2020). Taking stock of environmental education policy in England – the what, the where and the why. *Environ. Educ. Res.* 26, 305–323. doi: 10.1080/13504622.2019.1707513

Green, A. (2021). Challenging conventions—a perspective from within and without. *Front. Sustain.* 2:662038. doi: 10.3389/frsus.2021.662038

Greer, K., King, H., and Glackin, M. (2023a). The 'web of conditions' governing England's climate change education policy landscape. *J. Educ. Policy* 38, 69–92. doi: 10.1080/02680939.2021.1967454

Greer, K., Sheldrake, R., Rushton, E., Kitson, A., Hargreaves, E., and Walshe, N. (2023b). *Teaching climate change and sustainability: a survey of teachers in England*. University College London. London, UK

Guarino, C. M., and Borden, V. M. H. (2017). Faculty service loads and gender: are women taking Care of the Academic Family? *Res. High. Educ.* 58, 672–694. doi: 10.1007/s11162-017-9454-2

Haney, T. J. (2015). Factory to faculty: socioeconomic difference and the educational experiences of university professors. *Can. Rev. Sociol.* 52, 160–186. doi: 10.1111/cars.12069

Hatzisavvidou, S. (2020). Inventing the environmental state: neoliberal common sense and the limits to transformation. *Environ. Politics* 29, 96–114. doi: 10.1080/09644016.2019.1684732

Haven, T., Pasman, H. R., Widdershoven, G., Bouter, L., and Tijdink, J. (2020). Researchers' perceptions of a responsible research climate: a multi focus group study. *Sci. Eng. Ethics* 26, 3017–3036. doi: 10.1007/s11948-020-00256-8

Hegarty, K., Thomas, I., Kriewaldt, C., Holdsworth, S., and Bekessy, S. A. (2011). Insights into the value of a 'stand-alone' course for sustainability education. *Environ. Educ. Res.* 17, 451–469. doi: 10.1080/13504622.2010.547931

Hodson, D. (2014). "Becoming part of the solution: learning about activism, learning through activism, learning from activism" in *Activist science and technology education. Cultural studies of science education*. eds. J. Bencze and S. Alsop (Dordrecht: Springer)

Imants, J., and Van der Wal, M. (2020). A model of teacher agency in professional development and school reform. *J. Curric. Stud.* 52, 1–14. doi: 10.1080/00220272.2019.1604809

IPCC (2023). "Climate change 2023: Synthesis report" in *Contribution of working groups I, II and III to the sixth assessment report of the intergovernmental panel on climate change [Core Writing Team]*. eds. H. Lee and J. Romero (Geneva, Switzerland: IPCC), 35–115.

Jickling, B., and Wals, A. E. (2008). Globalization and environmental education: looking beyond sustainable development. *J. Curric. Stud.* 40, 1–21. doi: 10.1080/00220270701684667

Kenny, J., and Fluck, A. E. (2022). Emerging principles for the allocation of academic work in universities. *High. Educ.* 83, 1371–1388. doi: 10.1007/s10734-021-00747-y

Kinol, A., Miller, E., Axtell, H., Hirschfeld, I., Leggett, S., Si, Y., et al. (2023). Climate justice in higher education: a proposed paradigm shift towards a transformative role for colleges and universities. *Clim. Chang.* 176:15. doi: 10.1007/s10584-023-03486-4

Kopnina, H. (2016). Of big hegemonies and little tigers: Ecocentrism and environmental justice. *J. Environ. Educ.* 47, 139–150. doi: 10.1080/00958964.2015.1048502

Kopnina, H. (2020). Education for the future? Critical evaluation of education for sustainable development goals. *J. Environ. Educ.* 51, 280–291. doi: 10.1080/00958964.2019.1710444

Latter, B., and Capstick, S. (2021). Climate emergency: UK universities' declarations and their role in responding to climate change. *Front. Sustain.* 2:660596. doi: 10.3389/frsus.2021.660596

Leal Filho, W., Will, M., Lange Salvia, A., Adomßent, M., Grahl, A., and Spira, F. (2019). The role of green and sustainability offices in fostering sustainability efforts at higher education institutions. *J. Clean. Prod.* 232, 1394–1401. doi: 10.1016/j.jclepro.2019.05.273

Lele, S. (2017). Sustainable development goal 6: watering down justice concerns. *WIREs Water.* 4:e1224. doi: 10.1002/wat2.1224

Machado de Oliveira, V. (2021). *Hospicing modernity: Facing Humanity's wrongs and the implications for social activism*. Berkeley, CA: North Atlantic Books

McCowan, T. (2020). The impact of universities on climate change: a theoretical framework. Transforming universities for a changing climate, working paper series no. 1. Available online: https://www.climate-uni.com/resources

McGeown, C., and Barry, J. (2023). Agents of (un)sustainability: democratising universities for the planetary crisis. *Front. Sustain.* 4:1166642. doi: 10.3389/frsus.2023.1166642

Meadows, D. (1999). *Leverage points: Places to intervene in a system*. Hartland, VT: The Sustainability Institute.

Miller, J. (2019). Where does the time go? An academic workload case study at an Australian university. *J. High. Educ. Policy Manag.* 41, 633–645. doi: 10.1080/1360080X.2019.1635328

Molla, T., and Nolan, A. (2020). Teacher agency and professional practice. *Teachers Teach.* 26, 67–87. doi: 10.1080/13540602.2020.1740196

Morse, M., Jickling, B., and Quay, J. (2018). Rethinking relationships through education: wild pedagogies in practice. *J. Outdoor Environ. Educ.* 21, 241–254. doi: 10.1007/s42322-018-0023-8

Nussbaum, M. (2011). *Creating capabilities; the human development approach*. Cambridge, MA: Harvard University Press.

Nussbaum, M. (2023). *Justice for animals: Our collective responsibility*. New York: Simon & Schuster

O'Meara, K., Kuvaeva, A., Nyunt, G., Waugaman, C., and Jackson, R. (2017). Asked more often: gender differences in faculty workload in research universities and the work interactions that shape them. *Am. Educ. Res. J.* 54, 1154–1186. doi: 10.3102/0002831217716767

O'Neil, J. K. P. (2021). Institutional fragility: structures of dominance in American higher educational institutions inhibiting sustainable education. *Front. Sustain.* 2, 1–4. doi: 10.3389/frsus.2021.662527

O'Neill, K., and Sinden, C. (2021). Universities, sustainability, and neoliberalism: contradictions of the climate emergency declarations. *Politics and Governance.* 9, 29–40. doi: 10.17645/pag.v9i2.3872

Olsen, J., Griffiths, M., Soorenian, A., and Porter, R. (2020). Reporting from the margins: disabled academics reflections on higher education. *Scand. J. Disabil. Res.* 22, 265–274. doi: 10.16993/sjdr.670

Owens, J., Entwistle, V. A., Craven, L. K., and Conradie, I. (2022). Understanding and investigating relationality in the capability approach. *J. Theory Soc. Behav.* 52, 86–104. doi: 10.1111/jtsb.12310

Robeyns, I. (2005). The capability approach: a theoretical survey. *J. Hum. Dev.* 6, 93–117. doi: 10.1080/146498805200034266

Royal Anniversary Trust. (2023). Accelerating the UK tertiary education sector towards net zero: a sector-led proposal for action and connected thinking. Available online: https://www.queensanniversaryprizes.org.uk/wp-content/uploads/2023/01/Accelerating-towards-Net-Zero.pdf

Saito, M. (2003). Amartya Sen's capability approach to education: a critical exploration. *J. Philos. Educ.* 37, 17–33. doi: 10.1111/1467-9752.3701002

Schlosberg, D. (2012). "Justice, ecological integrity, and climate change" in *Ethical adaptation to climate change: Human virtues of the future*. eds. A. Thompson and J. Bendik-Keymer (Cambridge, MA: MIT Press)

Sen, A. (1999). *Development as freedom*. Oxford: Oxford University Press

Sen, A. (2009). *The idea of justice*. Cambridge, MA: Harvard University Press

Sibbel, A. (2009). Pathways towards sustainability through higher education. *Int. J. Sustain. High. Educ.* 10, 68–82. doi: 10.1108/14676370910925262

SOS (2022). Sustainability skills survey 2021–22: Research into students' experiences of teaching and learning on sustainable development, Higher Education Report. Students Organising for Sustainability. Available online: https://www.sos-uk.org/research/sustainability-skills-survey

Sterling, S. (2017). "Assuming the future: repurposing education in a volatile age" in *Post-sustainability and environmental education*. eds. B. Jickling and S. Sterling (Cham: Palgrave Macmillan), 31–45.

Sterling, S. (2021). Concern, conception, and consequence: re-thinking the paradigm of higher education in dangerous times. *Front. Sustain.* 2, 1–13. doi: 10.3389/frsus.2021.743806

Stewart, I. S., Hurth, V., and Sterling, S. (2022). Editorial: re-purposing universities for sustainable human Progress. *Front. Sustain.* 3, 1–4. doi: 10.3389/frsus.2022.859393

Stewart, F., Ranis, G., and Samman, E. (2018). *Advancing human development: theory and practice*. Oxford: Oxford University Press

Stoddard, I., Anderson, K., Capstick, S., Carton, W., Depledge, W., Facer, K., et al. (2021). Three decades of climate mitigation: why Haven't we bent the global emissions curve? *Annu. Rev. Environ. Resour.* 46, 653–689. doi: 10.1146/annurev-environ-012220-011104

Sultana, F. (2022). The unbearable heaviness of climate coloniality. *Polit. Geogr.* 99:102638. doi: 10.1016/j.polgeo.2022.102638

Tannock, S. (2020). The oil industry in our schools: from petro Pete to science capital in the age of climate crisis. *Environ. Educ. Res.* 26, 474–490. doi: 10.1080/13504622.2020.1724891

Taylor, A., and Pacini-Ketchabaw, V. (2015). Learning with children, ants, and worms in the Anthropocene: towards a common world pedagogy of multispecies vulnerability. *Pedagog. Cult. Soc.* 23, 507–529. doi: 10.1080/14681366.2015.1039050

Teach the Future. (2021). Teaching the future: Research with UK teachers on the current state and future of climate education. Available online: https://www.teachthefuture.uk/teacher-research

University and College Union. (2022). Workload survey 2021 data report. Available online: https://www.ucu.org.uk/media/12905/UCU-workload-survey-2021-data-report/pdf/WorkloadReportJune22.pdf

Venkatapuram, S. (2013). Health, vital goals, and central human capabilities. *Bioethics* 27, 271–279. doi: 10.1111/j.1467-8519.2011.01953.x

Verlie, B. (2022). *Learning to live with climate change: from anxiety to transformation*. Abingdon: Routledge.

Walker, M. (2005). Amartya Sen's capability approach and education. *Educ. Action Res.* 13, 103–110. doi: 10.1080/09650790500200279

Warlenius, R. H. (2022). Learning for life: ESD, ecopedagogy and the new spirit of capitalism. *J. Environ. Educ.* 53, 141–153. doi: 10.1080/00958964.2022.2070102

Washington, H., Piccolo, J., Gomez-Baggethun, E., Kopnina, H., and Alberro, H. (2021). The trouble with anthropocentric hubris, with examples from conservation. *Conservation* 1, 285–298. doi: 10.3390/conservation1040022

Waterfield, B., Beagan, B. L., and Mohamed, T. (2019). "You always remain slightly an outsider": workplace experiences of academics from working-class or impoverished backgrounds. *Canadian Rev. Sociol. Revue canadienne de sociologie* 56, 368–388. doi: 10.1111/cars.12257

WHO (2021). COP 26 special report on climate change and health: the health argument for climate action World Health Organization. Available online: https://www.who.int/publications/i/item/9789240036727