Bringing to Life the Qualities of a Meaningful Transformative Education

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Abstract
This paper shares a heuristic to support thinking about meaningful transformative education within the context of the contemporary environmental and social crisis. We describe the context of this work and explore the epistemological foundations for this model, which has been evolving and guiding our research and teaching and which underpins the six qualities of meaningful transformative education. The qualities are being open to alternative visions of the future and alternative approaches to education, accepting and embracing complexity, incorporating multiple types of knowledge, reorienting towards justice, developing ecological worldviews and supporting students to bring about systemic change. We also present a series of illustrative vignettes, informed by real-world practices of schools in England, which bring these qualities to life. The vignettes and subsequent discussion highlight possibilities and challenges for enacting a meaningful transformative education in schools.

Introduction

With increasing intensity and frequency, we are all experiencing the impacts of multiple environmental challenges threatening a liveable planet. Climate change, air and water pollution and loss of habitable areas combined with devastating biodiversity loss are cited daily by the media as ravaging Earth (see The International Panel on Climate Change, 2023). These blows to the environment are already and, in some cases, profoundly undermining education outcomes for many populations worldwide, and education systems require transformation if we are to unlock the knowledge and skills for humans and ecosystems to thrive and not just survive (Prentice *et al.*, 2024). Government ministries of education, such as that in England, are starting to respond; however, the policies are piecemeal, narrowly focused and conservative in their vision (Dunlop & Rushton, 2022; Glackin & King, 2020). Driven by a duty of care and responsibility for their students, whilst acknowledging policy shortfalls and larger system failures, a growing number of educators, both individually and collectively, are seeking guidance to develop pedagogical practices that recognise and respond to the fragility of life on Earth.

In 2020, as the momentum of the climate change protests was building and demands for "more!" climate change education were being made (Watts, 2019), we were questioning what climate change education should entail. Whilst it was clear that this type of education focused on the impacts of climate change through learning (Anderson, 2012), we were convinced that it was more than what is taught in science or geography classrooms and went further than calls for

"action" and "agency" (Finnegan, 2022). However, beyond that, and alert to the number of framings presented in the literatures from a range of perspectives (e.g. Barrett *et al.*, 2017; Busch *et al.*, 2018; Busch, 2016), we struggled to articulate what "it" was. Although reluctant to step into the perpetual (and oftentimes unhelpful) debates that seek to define a field, we were curious about the extent to which climate change education might be similar to, or differ from, other related approaches to education, such as environmental education, sustainability education and education for sustainable development. Hence, to explore the concept and to expand our understanding of what climate change education might be, we engaged with theoretical and empirical research literature that included discussion of the same. This review revealed six key themes flowing through scholarly discussion about this type of education (Greer, 2021). Given that we did not set out to provide a pithy definition of climate change education or a normative model, we framed the themes as "six key qualities that contribute to meaningful educational responses to climate change" (Greer & Glackin, 2021, p. 16) and presented them as a review of the research literature. In brief, and discussed in full below, the qualities are offering and being open to alternative visions of the future and alternative approaches to education, accepting and embracing complexity, incorporating multiple types of knowledge, reorienting towards justice, developing ecological worldviews and supporting students to bring about systemic change.

Since the original qualities were published, we have found ourselves sharing them in our teaching and presentations to wider audiences when talking about climate change education and about environmental education more broadly. We have found that they have been met with greater degrees of interest than some other materials that we have shared and that many people want to "use" them. On the one hand, the interest in our research has been uplifting, yet we have also felt growing unease about this attention for two key reasons.

First, we felt disquiet about the epistemological and ontological foundations of this "model". Our thinking had been shifting as to whether these qualities (and the education that is needed) respond to climate change or whether they respond to broader ecological and social issues being faced by Earth. Furthermore, we knew that our original article had not shared our guiding principles explicitly, and this seemed disingenuous to those meeting the ideas on paper and without our in-person oral explanations.

Second, working separately, we reworked the qualities — which were published as text-rich explanatory descriptions — into visual models to share in teaching presentations. Whilst visual models can help to engage with an audience, we both harboured doubts as to how effectively our respective models captured the relationality, fullness or essence of the qualities. In effect, these models may have suggested to our audiences that the qualities were indeed prescriptive and ready to be applied, whereas in fact, we had not yet investigated the application ourselves. That is, whilst we stand by the integrity of the "themes" in that they were identified through an extensive review of theoretical and empirical research literature, we had not established the extent to which they can help to develop "more meaningful education responses to climate change" (e.g. enacted through curriculums, pedagogy, policy or professional development) or any process by which to do so. Although examples of practice can be identified within some of the literature that we originally explored, these examples were limited. Further, there were limited discussions on how these themes might be actioned at a particular level — in classrooms, in particular subjects or across a school. Through discussions with practitioners, we have come to realise that the qualities are a useful planning tool across a range of school levels; with policy professionals, they have sparked and supported fruitful dialogue about adaptations to education systems in different countries and contexts. This paper, therefore, first revisits the qualities, setting out their epistemological foundations with respect to our understanding of a meaningful education in the context of the current ecological and social crisis. Second, it builds on our original thinking by bringing to life the qualities with some practical applications across multiple school levels and contexts. Finally, we touch on the emotional labour required by educators to experiment with crisis-orientated responsive pedagogy whilst negotiating the structures of an education system

dominated by neoliberalism and acknowledging the restraining power of assessment and other accountability structures.

(1) The epistemological foundations of the model

Values, beliefs and visions shape our relationship with, and analysis of, the research literature. Acknowledgement of this is particularly important here, as the intention of our research is to support educators in their own development and practice of a (more) meaningful education. That is, "meaningful" can be understood in multiple ways. We were cognisant that our beliefs concerning the role of education and our visions for societal and ecological futures shaped our responses to the research literature and the resulting list of "qualities" that we distilled. Consequently, and working reflexively, we sought to share the epistemologies and values that have informed the qualities. In doing so, we want to underscore the importance of beliefs and values to mediate our decisions, in this case, related to pedagogies that respond to the socio-ecological crisis. We aim to dispel the myth of an objective fixed list of top-down instructions from, for example, academics or policymakers and instead to practise a transparent heart- and head-led enquiry that underpins what we came to recognise as our own approach to pedagogy and the environmental and social crisis. Our original enquiry into what a meaningful educational response to climate change might entail was understood through two entangled avenues of thought: first, a reframing of education and, second, a vision of the future world.

Reframing education

Our first avenue for thinking about future concerns involved reframing the purpose of education; initially, this was in the context of climate change, but latterly, we have broadened our focus, acknowledging the unfolding polycrisis, which has been defined as the interplay between the COVID-19 pandemic, multiple military conflicts, the energy, cost of living and climate crises, which include climate change, biodiversity loss and water and air pollution (World Economic Forum, 2023). Alongside others, we have previously argued (Greer *et al.*, 2023) that the policy landscape in England is dominated by aspirations for economic growth, and thus, climate change responses are economically construed. Within such framing, the purpose of education is oriented towards work and participation in an economy that depends upon consumptive behaviours to fuel growth. Meanwhile, the planetary boundaries within which humanity can continue to develop and thrive are transgressed, increasing the risk of rapid and irreversible environmental changes (Richardson *et al.* 2023). The environmental and sustainability education endorsed in policy, for example, in England, arguably adheres to economic values by suggesting that technological and scientific developments comprise the principal answers to any threats and, in turn, highlighting the important role of STEM subjects and technology focused careers (Hursh *et al.*, 2015). We argue that this policy orientation makes education, and by extension society, not fit for purpose in our context of escalating crises; thus, we join a chorus of voices in the environmental education literature (including Jickling & Sterling, 2017; Kopnina & Cherniak, 2016; Vare & Scott, 2007) in arguing that the purpose and orientation of education needs to be revisited promptly.

We echo Kopnina and Cherniak's (2016) call for an education that fosters deliberative and democratic exchanges of ideas and advocates for more-than-human species. Moreover, in accordance with Kopnina (2020), we assert that education needs to be decoupled from the hegemony of economic growth to allow for its alignment with the natural environment and empowerment, inclusive of (all) human and more-than-human rights. We are alert to the deceptive practices of sustainability and what Evans (2024) calls the "unstable-stabilizing" of this regime, which has sedimented into inertia, creating a false sense of security that masks the chaos of climate change and enabling the perpetuation of practices that are environmentally damaging. This position also chimes with the views of Sterling and Jickling, who call for a new purpose to be

framed in terms of "our common humanity and commitment to a safer, kinder, and flourishing world and planet" (Jickling & Sterling, 2017, p. 42). In adding to these voices, we contend that a reframed purpose of education needs to explicitly foreground the natural environment and care for all inhabitants of Earth and acknowledge environmental destruction as a crisis that requires an urgent response from all sectors of society. It places change, rather than climate change, as a central concern for education in acknowledgement of a rapidly changing future world and to orient towards education where the purpose is construed at a societal (or, rather, planetary) rather than individual level. Such a purpose would position education as part of society-wide efforts to accommodate more open views of a "good life," one that centres care and compassion, unyoked from economic growth. A shift is required from the broadly linear and systematic approach to education towards a more systemic and holistic approach. Arguably, such reframing could effectively upend the model of education that currently dominates in formal schooling globally, driven presently, as d'Agnese (2017, p. 3) describes, by the national and international assessment that sees education as "a totalizing rhetoric and economic penetration," which " . . . runs the risk to erase diversity of perspective and even educational plurality worldwide." It could generate a conceptualisation of education that centrally positions care for and contribution to Earth, supported by individual agency and knowledge, rather than positioning individuals' knowledge acquisition and agency as the aim, with the hope that "good" active citizens ensue.

To this end, we propose widening the meaningful qualities of education beyond the boundaries of "climate change education" as they were first designated, to reconceptualise them in terms of a broader pathway towards a transformative education agenda. This reconceptualisation towards a transformative education encapsulates our growing list of possible educational purposes and aligns with Sterling's (2010, p. 23) understanding of the concept that invites us to "see our worldview, rather than see with our worldview." We are in agreement with Biesta's (2021) call for depth education and world-centred education, recognising that the current system of schooling is fundamentally at odds with what is required if citizens are to have the intellect, knowledge, skills, capacities and capabilities, to meet and prosper in the face of the multiple challenges, including that of climate change and biodiversity loss.

In widening our focus beyond the narrow foci of a particular issue (e.g. climate change) and a particular learning outcome (e.g. knowledge retrieval), we are aware of a key challenge to reframing education that concerns pluralistic thinking. It would be fair to categorise our discussion so far as a pro-pluralist. That is, given the considerably changing societal and ecological conditions, alongside the rise in polarised debates, often mediated by social media platforms, which all play out against the backdrop of the instrumentalist schooling system, we judge that now is the time for a coordinated effort to ensure that diverse viewpoints are heard and debated. However, as Tryggvason, Öhman and Poeck (2023) in their detailed analysis of research on pluralism in the environmental and sustainability education field argue, pluralist approaches must have boundaries, and so we do not embrace an "anything-goes" relativism. Whilst agreement on boundaries is contentious, for schooling, Tryggvason and colleagues helpfully delineate the scientific consensus as a starting point for a legitimate boundary thereby making climate change and biodiversity loss denials inviolable. To further clarify this boundary, for example, the Intergovernmental Panel on Climate Change (IPCC) annual reports that summarise the state of climate science knowledge could act as a non-negotiable entry point for school systems. That is, schooling systems can accept the scientific consensus that there is a need to limit average global temperature rises to 1.5°C (IPCC, 2018) and that achieving this goal requires action from all sectors of society. At the same time, they can recognise ongoing uncertainties related to the ways that climatic changes will impact on human economies and societies and which methods of transition will be most effective, and most fair, in order to reduce emissions across all sectors on a global scale. Thus, the space for pluralism then shifts from unproductive debates of "is climate change an issue /real?" to exploring "how ought energy production be more globally equitable?"

However, given the human-centric worldview that has created the global problems faced, following Kopnina and Cherniak (2016), the pluralism we further align with, and advocate for, is more inclusive and radical, seeking to overcome narrow anthropocentrism. That is, the scholarship of Kopnina and Cherniak (2016), and the programmes of, for example, Macy and Brown (2014) have opened our eyes to the narrow pluralism currently bound up in education and the practices that follow, particularly in socio-environmental-related formal education, where students are presented with "only [choices] between different shades of anthropocentrism" (Kopnina & Cherniak, 2016, p. 832). That is, the rights of "different" humans are only those considered. Rather, these scholars have challenged us to reflect on our own anthropocentric position and the hegemony of "one-species only pluralism" in our writing and teaching (cf. Lindgren & Öhman, 2019, p. 1200). Macy and Brown (2014) describe anthropocentrism as human chauvinism, analogous to sexism, and encourage us to recognise our humanness as a small step in evolution and acknowledge our connectivity to other life forms such as mammals and vertebrates. Seed *et al.* (1988, p. 35) explain that in doing so "the fog of amnesia disperses, there is a transformation in your relationship to other species, and in your commitment to them."

In calling for a pluralistic approach to education, we are alert to the embedded contradictory messages this could present. That is, the pluralistic approach to education is bounded by the epistemic norms of the broad scientific consensus surrounding the environmental crisis and a commitment to eco-centric values and social and ecological justice. Our approach to pluralism is therefore pragmatic — a work in progress — an attempt to support richer communications taking place in our classrooms concerned with all human and more-than-human planetary futures. Given that we are nature, we are positioned *for* nature. Hence, we acknowledge these conflicts and align with Kopnina and Cherniak's sentiment that "we are for pluralism as a working process that can serve education, environmental thinking, and decision-making; but against pluralism as an end in and of itself" (2016, p. 836).

From surviving to thriving

In exploring what a future transformative education might be, we have started to share the future we envisage. In the words of Kate Raworth (2017), we envisage a future where all humans and more-than-humans are thriving, not just surviving, thus our "vision" should draw broad concord. However, when juxtaposed against the current policy framing in England whereby, to point to just one of many examples, the Department for Business and Trade's core purpose is " . . . for economic growth" to be able "to invest, grow and export" (Department for Business & Trade, 2024) the gravity of the work and energy required to begin to achieve our vision becomes clear. Built on neoclassical economics, the extractive linear business model we are operating under is no longer tenable. It was created at a time when infinite growth was assumed, unquestioned and framed as always advantageous and when knowledge of planetary boundaries (Richardson *et al.*, 2023) and tipping points were less widely understood (Hickel, 2020). However, today, the neoliberal growth and consumption model of modernity is evidently not fit to sustain (human) life on Earth, let alone flourish. Indeed, survival for many humans and more-than-humans on the planet is already threatened. Whilst broadly, politicians and citizens have accepted the science of, and negative outcomes arising from, climate and environmental change, this business-as-usual model still prevails, upheld by what Stevenson (2007) suggests are "conservative reforms" — approaches that maintain the status quo and support the primacy of economic growth. That is, within this ideological framing, the required environmental improvements are delivered via technological advances, political tweaks (e.g. amendments to laws, establishment of new ministries) and behaviour change, all enabled through economic growth. For decades, the majority of us have been knowingly and, for some, purposely, deluding ourselves that these approaches would bring about the significant changes needed (De Oliveira, 2021) including, for example, the drastic reduction of carbon emissions and that life would continue as we had been

promised or as we envisaged (e.g. have a job, obtain a mortgage, have children, have a pension, have health care, have a garden and go on an overseas holiday once a year).

Faced daily with the reality of flooding, polluted air and water, temperature increase and biodiversity loss, conservative reform has not, and will not, enable us to achieve our vision for all beings to thrive. However, Stevenson identifies a second ideological framing towards environmental improvement termed "radical reform," which is more attuned to our own beliefs. The term "radical" is potentially unhelpful, because some might consider negative and alarmist associations with radicalisation, but as Stevenson was writing some 15+ years ago, we suggest, at least in our circles, that models such as Stevenson's that align with social critical approaches are now increasingly being discussed — hence, hardly radical. In essence, in place of the dominant role of economic growth, a social critical approach "calls for major economic reorganisation as the only way to rectify violations of both environmental quality and social justice" (Stevenson, 2007, p. 142). Such an approach acknowledges the past half-century of "neoliberal unmaking" (Klein, 2023, p. 231), which has fostered the ascent of individualism and the descent of state-supported societies, created soaring housing, tuition, medical and energy costs and led to a widening inequality gap where power is held by the few rather than the many (Sriskandarajah, 2024). Further, a social critical approach recognises that Western notions of progress have ignored and, worse, trampled upon Indigenous and alternative ways of knowing and being which we are increasingly realising is to the detriment of all beings (De Oliveira, 2021).

This acknowledgement and ideological foundation enables us to begin to build from, as well as better understand, which discourses, movements and programmes are most directly aligned to achieving a vision through practices for collective thriving. Transformative pedagogy needs to enable "learners [to] question and reframe unconscious attitudes and values" (Burns, 2015, p. 260). Here, we have found valuable ideas from Joanna Macy and her collaborators within "The work that reconnects" (Macy & Brown, 2014). This movement builds on several related, foundational ideas including deep ecology (Naess, 1973), celebrating Earth as a self-organising living system and recognising the inherent value of all life forms; systems thinking, the science of the "living system" affirming the interconnection and interdependency of all beings; deep time, connecting with our ancestors and future beings on Earth; and, spiritual traditions, particularly Buddhist and Indigenous perspectives (Macy & Brown, 2014). Macy and colleagues present a nonlinear view of reality, illuminating the mutuality at play in self-organising systems and the potential power of reciprocity. These ideas offer a bridge to the empowering notion of our individual and *collective* agency, offering an ability to create and choose another version of our future — or story about the world — which we value and want to serve.

Returning to Stevenson's social critical approach to environmental improvement, if we are to denounce the business-as-usual approach and call for an approach that is *for* nature, we need to co-create "foundational renewal" (Sriskandarajah, 2024) that generates an alternative story, or "the great turning," as termed by Macy and Johnstone (2022). Hence, for ecological thriving, our education system, and the society within which it is embedded, requires policy text and discourse to assume humans as support actors, equal to other beings, acknowledging that each organism has inherent worth, and has a specific and important role. Going further, there must be a shared acknowledgement that Earth and the universe will carry on with or without humans. Given the dominant worldviews held, a new relationship with the natural world needs to be nurtured to grow from within the current context, one that seeks to be regenerative of life on Earth. Although the past is useful to learn from, it is not about returning to a previous relationship because humans have never before experienced the Anthropocene, characterised by biodiversity loss and Earth's damaging action, exponential global population growth and also an immense quantity of "knowledge." There is something ironic here, which resonates with Evans' (2024) critique of sustainability, that whilst the Anthropocene gives us the tools and insights to push for a new "sustainable" era it is due to the human-centrism of which the epoch is named that we find ourselves in the numerous crises today.

We have therefore argued that the significant societal changes required to achieve an Earth where all humans might prosper require an active reorientation of education towards a meaningful response to climate change and biodiversity breakdown. That is, transformative education agenda is required, in which, to paraphrase Bangay and Blum (2010), the responses to the polycrisis are *integral* rather than *additional* to broader debates and any reform they generate.

Qualities for a meaningful transformative education: Views from research literature

Returning to the epistemological approach that underpins our original heuristic (Greer & Glackin, 2021) and recognising that it is an entangled polycrisis that we face, rather than a single issue crisis of climate change, Box 1 presents an updated version of the six qualities for a meaningful transformative education. Rather than delineating the "right approach" when considering the role of education in responding to the polycrisis, we consider the six qualities as a heuristic, a thinking tool, that provides prompts or doorways into re-envisaging education. None of the qualities stand alone; they intersect with one another, although each can provide a useful stepping-off point for reflecting upon, or developing, transformative education practice. This is an affordance of the model. The qualities are overlapping but have nuanced differences; there are important synergies and interconnectivity between them, and they offer numerous entry points to transformative education.

Box 1. The qualities for a meaningful transformative education

Adapted from Greer and Glackin (2021)

First, and overarching the five subsequent qualities, is that a meaningful educational response to the polycrisis will be open to both creating and learning about **alternative visions** of the future and alternative approaches to education. Such visions will be unwedded to assumptions of perpetual economic growth (for nations or the world) and increasing wealth and prosperity (for organisations and individuals) and, instead, promote living that achieves equity and sufficiency among humans and all species on Earth (Sterling, 2017). Alternative approaches to education should be decoupled from narrowly defined outcomes that are measurable in exams and rigid inspection regimes (e.g. Kagawa, 2010).

Second, climate change and biodiversity breakdown are inherently complex issues with multifaceted causes, consequences and solutions. A meaningful transformational education cannot shy away from this complexity; indeed, it must **accept and embrace complexity** and explicitly consider (in ways appropriate to students' ages) mitigation and adaptation, disaster risk, social and environmental justice and complex trade-offs that are part of deciding how to respond, all broached through a diversity of pedagogical approaches (Kagawa & Selby, 2010; Stevenson, Nicholls, & Whitehouse, 2017).

Third, a transformational education needs to **incorporate multiple types of knowledge** (Kagawa *et al.*, 2010). This includes disciplinary content that aligns with traditional school-based curricula, such as that taught in science or geography, and that supports students to establish a foundation for richer understandings as well as teaching and learning across a wider range of disciplines and bridging disciplinary boundaries. It includes supporting students to understand how to critique knowledge and its sources and recognises that, more importantly than knowing answers, students need skills to solve complex problems. Alongside these knowledge types that are common in mainstream schooling, it involves developing young people's spiritual and emotional knowledge (Ojala, 2016) so that they can connect to other humans, to other species and to Earth as a whole and engage with emotions related to climate change (Jickling *et al.*, 2018). Developing these knowledges involves pedagogies that take students beyond hegemonic perspectives (e.g. Nxumalo & Montes, 2023) and beyond human experience to consider emotion and spirituality beyond sensory experience, acknowledging and exploring the interconnectivity of life through love, compassion, altruism, wisdom, death, denial and truth.

The fourth quality is to **reorient towards justice**. Rather than education being oriented towards jobs and economic participation, and environmental and sustainability education fixating upon science and

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technology as the salvation of the crisis, transformative education would advocate understanding ecological damage as an issue of justice and of inequity among humans, and between humans and other species (Lotz-Sisitka, 2010). In effect, this requires a process of "unlearning" (Stevenson, Whitehouse, & Field, 2024) the beliefs and practices that have created inequity and unsustainability and of new learning to build a socio-ecologically flourishing Earth community. It involves recognising both global and local perspectives and that everyone shares the risk and, by engaging students in local participatory learning, it recognises that local solutions are fundamental to an effective global response. Crucial here is acknowledging the inextricability of a functioning environment and the attainment of social justice for all (Agyeman *et al.*, 2016).

Fifth, and related to understanding the polycrisis as a matter of justice, is to intentionally **develop ecological worldviews**. A meaningful educational response to environmental degradation would involve revisiting and transforming the relationship between humans and the more-than-human world, that is, with all other species on Earth, and encountering the trouble of human's disregard for other species, the very disregard that has enabled the extractive and damaging economy. Education would include an explicit focus on the rights of other species, and the importance of such recognition for their own survival and for future generations of humans and more-than-humans (Sterling, 2017).

The sixth and final quality for transformative education is to **support students to bring about systemic change**. This involves a shift from viewing students as recipients of information and observers and future inheritors of environmental-related problems, to recognise young people as participants in society's response to the socio-environmental crisis and as collaborators in society's transformation through action-oriented approaches and authentic engagement (Rousell & Cutter-Mackenzie-Knowles, 2020).

(2) Bringing the qualities to life

By sharing the qualities of a meaningful education with practitioners in their emergent, non-dogmatic form, we have been privy to a rich range of educators' understandings and, in turn, their applications. We have shared the qualities at multiple presentations attended by educators and education policymakers in England. We have facilitated workshops with combined groups of staff and students, joined discussions with teaching teams and explored the potential of the qualities with individual teachers. More specifically, we have worked with several secondary school teachers, in the south-east of England, to understand the transference and transformation of the qualities into practice. On first engagement, we have found that the list of qualities has encouraged important discussions as to the values and intentions of schooling, acting as a set of enquiries if you will, to explore personal and organisational values.

Educators we have presented our work to have spoken about putting the qualities to work at three broad organisational levels. The first is at a macro level that includes the use of the qualities for policy development within government departments (e.g. Department for Education), the local authorities and the Multi-Academy School Trusts. The second is at a meso level, to support a whole school approach, guiding the articulation of school-level values. The third organisational level is at a micro level of teachers' practice, where there are opportunities for the qualities to be brought to life at two further sub-levels. One is the subject-specific sub-level, where the qualities are used to rescript and orient a subject's approach or topic, for example, in physical education when teaching "healthy lifestyles." A second is to support the development of pedagogical practices that align with, or embody, the qualities. The pedagogical approach might be specific to the subject discipline, or it might be more generalisable and therefore transferable to a range of subjects.

An alternative and pragmatic entry point for applying the qualities is in conjunction with the Four Cs approach, a widely used framework that highlights the multi-dimensional nature of sustainability in education institutions (see, e.g. Rickinson *et al.*, 2016; National Association of Environmental Education, 2020). Offering a further filter to the levels outlined above, the approach invites educators to reflect on the qualities in terms of the curriculum, including teaching and learning; the campus, for example, buildings, grounds and budgets; the community,

both inside and outside the school; and the culture, that is, the ethos and practices embodied within all aspects of school life.

Returning to our original rationale for the paper, this penultimate section offers illustrations that have emerged following discussions with educators working in secondary schools in England of how the qualities could be put into practice, to support the work of transformation. The vignettes offer illustrations across the organisational levels of the school and indicate a possible alignment with one of the Four Cs. The scenarios are fictitious but are based on real-world practices, which we have discussed with educators in England and we highlight genuine, accessible resources where appropriate, listed in full at the end. The school and teacher names have been created. Our conversations with educators, when coupled with our own attempts to incorporate the qualities into our work, have enabled us to recognise the significant emotional work that is required from educators if they are to reflect on and challenge current ways of knowing and doing. To underscore and normalise the importance of this emotional labour our vignettes illustrate where it might be seen or felt by community members. Our intention in sharing these vignettes is that they act as jumping-off points, or conversation starters, that are developed in relation to the culture and context in which they are discussed, rather than they be replicated in practice.

Bringing the qualities to life: Vignettes

Quality: Be open to alternative visions of the future

Level/focus: Whole School: Community and Culture

Two teachers from the English department at Bradbury Park School found that they had both recently read Rob Hopkins' book "From what is to what if" (2019), which explores how we might imagine and create possible futures we want. As they were talking about Hopkins' ideas over a cup of tea, they realised how tentative and nervous they felt when sharing their ideas about the future that they wanted and how it could be achieved. They reflected that this was possible because they rarely spent time thinking deeply about the future, or discussing their ideas with colleagues, and wondered if others might feel the same. Mustering courage, they decided that they would create an opportunity for themselves, and others from the school community, to think about and discuss alternative visions of the future. One of the teachers was on the school's eco-committee so, supported by the committee, they ran a series of events inviting the school community (staff, students and some interested parents who were part of the eco-committee) to explore their separate and shared visions of the future and more specifically 2035. They used resources provided by the Long Time Academy (www.thelongtimeacademy.com) to help them do this. Their objectives were, first, to encourage individuals, many for the first time, to articulate the futures they want and to see overlaps and differences between their vision with other members of the community. Second, to explore reasons for their emerging visions and document any insurmountable differences. And, finally, to discuss pathways to achieve the visions, with consideration for what is and isn't in their control. The eco-committee presented the outcomes in assemblies, to the school senior leadership team and the governors.

Quality: Accept and embrace complexity

Level/focus: Classroom: Curriculum

At Fairfield High School, the Design and Technology teacher developed a series of lessons for Year 9 (aged 13–14) which focused on the use of plastics. Building from the National Curriculum statement "develop specifications to inform the design of innovative, functional, appealing products that respond to needs in a variety of situations" (Department for Education (DfE), 2014, p. 89), the teacher interpreted this in her unit to help students think critically about the affordances and drawbacks of plastics and the growing number of alternatives. In doing so, the

teacher planned to build opportunities for students to accept and embrace complexity. That is, the lessons were structured to explore the universal use, the usefulness and the relative cheap cost of plastic and focused on how it has revolutionised medical and life-saving equipment, for example, gloves, monitors and micro cameras. Students re-visited concepts from the science curriculum, such as the extraction of oils to produce plastics, the emissions produced in the process of making it, through to the difficulties of re-processing/recycling and landfill (including the ecological impacts of microplastics and the health-related impacts of plastic toxicity, for humans and more-than-humans alike). The next lessons in the series explored alternatives to plastics, for example, bamboo, mushrooms and seaweed, reflecting on their properties, affordances and drawbacks. A hands-on session provided opportunities for the students to work with the alternative materials: building bamboo structures, planting mushrooms to grow mycelium for fabrics (e.g. RHS" resource: how to grow your own mushrooms at home). The teacher was concerned that her decision to extend the series of lessons to provide opportunities for students to engage with "head," "heart" AND "hands" would truncate the time available for other topics, but she was also aware that students had campaigned for banning single use plastics and wanted to highlight the relevance and application of their studies. Towards the end of the lesson series, students recorded a 5-minute audio message for a young person living in 2045. The task invited them to explain the pros and cons of plastics and the growing ecological understanding of the use of the material in the 2020s, which seeded the rapid expansion of alternative materials.

Quality: Incorporate multiple types of knowledge

Level/focus: Classroom: Curriculum

A Science teacher taught the topic of plants to Year 8 (aged 12–13) students. This included learning the equation for photosynthesis and the factors influencing plant growth activity, specifically, the role of oxygen, water, pH and soil health. Whilst the content of the lessons had covered the curriculum requirements, and there was department pressure to move onto the next topic in the series, the teacher wanted to support the students to apply their plant knowledge and increase their awareness of alternative, and more sustainable, ways of living and being. In particular, she wanted to introduce them to other types of knowledge than what is included in the current assessment but would expand their understanding of the importance of agriculture and sustainable practices. So, for homework, the teacher invited the students to write a case study that explored how a different society has effectively cultivated the environment for crop growth by reducing the use of pesticides/herbicides or intensive agricultural practices, which decreases biodiversity and soil fertility. She asked that the case study be initially described and then the scientific processes, including photosynthesis, be explained. She suggested to the students that they commence their research using resources produced by the Food and Agriculture Organisations of the United Nations with a focus on case studies in the Global South (e.g. Lesotho, China, Kazakhstan, Indo-Gangetic Plains and Malawi and Zambia).

Quality: Reorient towards justice

Level/focus: Whole school: Campus

For ten years, the motto on the front gate of St Bede Secondary School has read "learning, kindness, justice." The leadership team were committed to making sure that these words actually guided the way they led the school but felt there was more they could do to reorient their work towards justice. So, with this commitment front of mind, when the next audit cycle came around to review their suppliers, they decided to expand the criteria that they used to make procurement decisions from simply the lowest monetary quote to include shipping costs, manufacture location and workers' rights (e.g. B Corp. certification). Based on the new criteria,

the bursar presented to the school council the outcomes for three significant procurement decisions for the school (e.g. energy supplier, catering and building maintenance). Based on the evidence and new methodology, the school council was invited to prioritise the suppliers.

Meanwhile, as part of the school's long-term estate management plan, the team had designated a project to upgrade the entry to the campus. They saw the opportunity for this upgrade to favour active transport, as part of their commitment to health and wellbeing and care for the environment. Thus, they had committed to the entry to be re-designed and landscaped to prioritise the outdoor space towards those who travelled by foot and bike over those who arrived by car. The entry gate for pedestrians, with the motto emblazoned across it, was moved from the side of the estate to the front, with attractive soft and hard landscaping that welcomed the community. However, they also were mindful of justice, so during the development stage, great consideration was given both to the more-than-human organisms in situ and to those which would be introduced. For example, the large dominant rhododendron bushes, that do not support significant local/native biodiversity were removed, to be replaced by locally sourced native deciduous tree saplings. However, given the beautiful foliage of the bushes had welcomed students for more than two decades and provided a scented and sheltered entry each day, before they were felled, the school community was alerted to their removal, and a short honouring ceremony took place during assembly (see, e.g. Seek the Light: Radio 4, 2024). Meanwhile, mature hazel hedgerows, which were incongruent with the landscapers' initial designs but offered significant value to wildlife, were worked into the redesigns, ensuring that the rights of more-than-humans were given fair consideration.

Quality: Develop ecological worldviews

Level/focus: Classroom: Curriculum

Back at Fairfield Secondary School, in a citizenship lesson with Year 9 (aged 13–14), a debate is organised to consider the positioning of a new housing development that has been proposed to be built a few blocks away from the school. The development will replace some unoccupied housing and a disused factory with substantial surrounding wasteland. The new development includes plans for private and social housing, a café and a dentist's and doctor's surgeries. The original aims of the lesson were to support the students develop skills of argumentation and to consider the different views of society according to "the roles played by public institutions and voluntary groups in society, and the ways in which citizens work together to improve their communities, including opportunities to participate in school-based activities" (DfE, 2014, p. 83). Whilst the teacher invited students to take traditional human-centric standpoints to include the landowner, local residents and first-time buyers, she also invited other students to take the perspectives of the bats, the bees, the earthworms and the trees that had moved into the disused factory and surrounding site. The latter was included to inspire an eco-centric perspective, adapting resources created by Macy's "The work that reconnects" (workthatreconnects.org). The voice of "future generations" was also invited — asking students to imagine how a young person might be impacted by the decision in 2035, for example. Students were encouraged to use the pronoun "I" when taking on the role(s)/viewpoint(s) including those of non-human actors, which initially elicited giggles and discomfort from some students. As the debate progressed, however, the students settled into their roles to give voice to each perspective.

This activity was also used with the D&T series of lessons given above. That is a debate/listening exercise was created inviting the students to assume different perspectives concerning plastic production: their own, a plastics factory worker/chemical engineer, a fish living in a local river/a heron and a young person alive in 2045.

Quality: Support students to bring about systemic change

Level/focus: Whole School: Campus and Culture

On "Ride to School Day" at Willowmead North School, there was a festive atmosphere as staff and students cycled into the school yard in the morning and chatted with each other as they parked their bikes in a specially designated (temporary) area. By the time the bell rang for the first lesson, the bikes had spread onto the neighbouring playground such was the uptake to ride to and from school for the day. Inspired by the enthusiasm for the day, a group of Year 10 students (aged 14–15) recognised the large number of journeys to and from school that were usually made by personal car use by students and staff. They talked with their classroom teacher (an avid cyclist herself!), and together, they wrote a list of demands about the changes they wanted to see to encourage more people to ride their bikes to school more often. The list included more official ride to school days, more under-cover bike racks to prevent wet seats and rust, bike handling skills and safety courses for people who were new to cycling, a bike-swap/second-hand bike section in the newsletter because young people grow out of bikes, and the coordination of a "cycling school bus" to help younger students, or those less confident, to ride to school. They sent this list to the head teacher, who was impressed and a bit overwhelmed! Primarily he wanted to encourage the students to show that they were able to bring about change. He also wanted to encourage bike riding, but it was more complicated than just saying yes or no. So, given the complexity and cost of the changes, the head established a sub-committee of the school council that includes teachers, students, the school business manager and a governor. This sub-committee discussed the student proposals, negotiated priorities and recognised trade-offs, and after a series of meetings, they reached agreement on a list of priorities which they presented to the school council. At the sub-committee students' views were expressed alongside those of other committee members, and they reach a consensus. The process supported deliberative dialogue, intergenerational participation and, importantly, more members of the school community commuting by bike.

Enactment: Taking courage

The purpose of this paper was twofold. First, we explored our ontological and epistemological understandings of education to explain the origins of the original *six qualities for a meaningful climate change education* proposed by Greer and Glackin (2021). This led us to recognise that the interrelationships of the multiple challenges we face go far beyond a single-issue crisis and require a re-orientation of the current formal education offer towards an expansive, transformative education. As a result, we broadened and reframed the original heuristic to present *six qualities of a meaningful transformative education*. In parallel with this development, as we shared the ideas with practitioners, an appetite was apparent for ground-up illustrative examples of the qualities that would enable them to envisage possibilities for the forms and shape they might take within educational contexts. In doing this, we were keen to acknowledge that rather than revolution, a shift in orientation, pragmatically speaking, depends upon an incremental evolution of educator's beliefs and practices — ultimately leading to whole system change.

Building from this, the second purpose of the paper was to share emergent responses to the qualities that are being discussed and enacted across schools in England. We chose fictitious vignettes as the vehicle to present these pockets of practice as they allowed for an illustration of the ways that the qualities interweave to provide a rich but accessible range of educational approaches that, to differing extents, challenge the current taken-for-granted practices within the neoliberal-led system. The vignettes also enabled us to touch on the crucial, but often under recognised, role that emotional labour plays when educators are grappling with their personal and professional responses to the crises and attempting to enact different ways of being and doing. For example, teachers in the vignettes felt initially nervous and then energised when sharing with colleagues their visions of the future. There was also frustration due to the constraints of the curriculum and

the limited time available for what many felt important subject-related teaching. Hence, we note that such work is frequently against the tide. Educator's emotions influence both what they think and what they do so that, often unknowingly, emotions impact pedagogical decisions. When teachers are disturbed, excited or uneasy, their choice of curriculum focus, their classroom strategy, illustrative examples or phrasing will shift. Consciously or not, teachers internalise the socio-ecological crises. Through direct local experiences or indirect media output, their bodies are increasingly enveloped in "emotional storms" (Verlie & Blom, 2022, p. 619). Such storms, Verlie and Blom (2022) elaborate, bring us beyond anthropocentric and teacher-centric approaches challenging us to consider the more-than-teacher and more-than-human agencies that are affectively and collectively contributing to schooling. In response, we, alongside colleagues (Owens *et al.*, 2023), have noted that educators increasingly find themselves navigating new emotionally charged terrains in their classrooms, as they trial novel and "risky" pedagogies that demand new skills, challenging their own beliefs and values along the way. How this work can be effectively supported is an aspect of our ongoing empirical work.

Central to this paper is the importance of educator's agency within their own institutions. The influence that educators' beliefs and values have on decisions and actions, be they small tweaks in practice or different turns of phrase and utterances, should not be underestimated. These actions, whether undertaken tentatively or otherwise, are the ingredients of transformative models of education. However, we have also acknowledged that when key enablers, such as policy and assessment, run contrary to this work, the significant emotional labour of the educators is required. Hence, whilst change needs to come from the ground up, as beliefs and values of people are central to transformation, matched attention is required on the suite of regulatory policies and the assessment frameworks that govern schooling (Gewirtz *et al.*, 2021). For example, where we have argued that a transformative education requires a pluralism that is pragmatic, one that supports richer communications that are concerned with all human and more-than-human planetary futures, we need to ask the question to what extent do policies and norms concerning political impartiality, as seen in England, consciously or unconsciously impede experimental and progressive pedagogical practices (Maxwell, 2024)? Similarly, if assessment approaches are dominated by written examinations requiring knowledge-rich, narrow pre-determined instrumentalist responses, how might this deter educators from broadening out and essentially complicating the education that they provide? Educators are stepping up to do their part across curriculum, campus and community, but now, it is incumbent on policymakers and related assessment makers to do their part to change the culture and structures of education. Fundamental questions about the purpose of education require revisiting, guided by a vision of a liveable, thriving, shared planet Earth.

As we acknowledged in our introduction, we are engaged in an ongoing process of working these ideas through and encouraged by the interest in the qualities, we are motivated to continue to trial, adapt and develop them in practice. We are aware that applying ideas of the qualities could threaten the ability of some of those who have the power to continue benefitting from the status quo. We will — and have — experienced these ideas meeting dead-ends, being closed down or misunderstood during discussion; however, despite a bruised ego or two, we are convinced about the need to continue this process/work and are determined to do so, alongside the community of educators who are thoughtfully and courageously reflecting on the work that they can do. We invite further development and tweaks of these ideas and experimentation in practice.

Resources

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Royal Horticultural Society. https://www.rhs.org.uk/advice/Hub-content/features/grow-mushrooms

Food and Agriculture Organisation of the United Nations. https://www.fao.org/countryprofiles/en/

Case studies, Global South. https://www.fao.org/conservation-agriculture/case-studies/lesotho/en/

The Work that Reconnects. https://workthatreconnects.org/

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