Eco-Education: A response to the Anthropocene and an uncertain future

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Abstract

This paper explores the potential of eco-pedagogies for fostering new environmental and consumption imaginaries. It departs from the Anthropocene to posthumanism, using Karen Barad's posthumanist quantum entanglements as a way to understand how our lives are enmeshed with commercial and carbon consumption cultures. Two case studies are presented aiming to illustrate how reductive current approaches to environmental education are exemplifying the importance of our sense of place and the potentialities of 'no toys'. The paper argues that what we need is a fundamental shift towards eco-education that surpasses sustainability as a curricular topic but offers a more radical and practical way of living. We need to foster human to non-human connections that allow for new materialities and forms of living that reach beyond schools and schooling – 'a more-than human' approach.

Keywords: anthropocene, ecological education, sustainability, children and young people, future

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Introduction

This paper is prompted by a call for education to take up the challenge of the Anthropocene (see, for example, Baughan, 2021; Jandric and Steinberg, 2021; Sutoris, 2021). It does so at a time when there are immediate questions surrounding how educational institutions should respond to the multilateral disruptions associated with the global coronavirus (Covid-19) pandemic and the damage caused by overconsumption of natural resources that are understood to be irreversible. The paper proposes that responses to the emergence of this new planetary reality depend fundamentally on an understanding of the origins and meaning of the Anthropocene, and especially, how it conceives the relationship between humans and the rest of life on the planet. It goes on to argue that familiar concepts of the human, of Nature, and relations between them rooted in Enlightenment modernity hinder attempts to navigate the challenges ahead. Instead, we suggest a posthuman approach (Barad, 2007) to understanding our relationship with nature and as a way of re-thinking aspects of human culture which are harmful to the environment.

As educators we advocate a shift towards *ecological education* that surpasses sustainability as a curricular topic but offers a root, branch, and systemic way of seeing curriculum, pedagogy, and institutions that not only acknowledges the agency of learners, but also the relations between the human and more-than-human communities (Abram, 1996) we all inhabit. We argue that the current Covid and ecological crises exhibit significant intersections, and that in these unprecedented times ecological posthuman education offers a practical and philosophically flexible response to the multiple challenges facing the planet. What is proposed in this paper recognises the value of accumulated knowledge and understanding in education as an intellectual 'memory bank', and eschews the predilection of technological or systemic innovation for its own sake.

Education has the capacity to actively shape what we think about and how we approach our environment, bodies and social relations. The question must be asked: How do we include the environment and sustainable development in our education system to create a future that instils hope in the younger generation? Through posthuman approaches there is an opportunity to reposition relationships between our human cultures and the natural world. Whilst a focus on sustainability is important,

more is needed to examine the ways in which our everyday cultures are reliant on unsustainable consumption. Focusing on education, this paper presents two short case studies where more sustainable practices can be embedded.

Key concept: the Anthropocene

In 2000 Nobel Prize winning atmospheric chemist and meteorologist Paul Crutzen (1933-2021) shocked a gathering of climate scientists when he declared that planet Earth could no longer be considered to be in the geological epoch known as the Holocene (or 'wholly recent time') but human agency had reshaped its interlocking atmospheric, oceanic, land, and biological systems so extensively that it was more appropriate to speak of living in the Anthropocene, the epoch of the humans (Crutzen and Stoermer, 2000; Crutzen, 2002; Clark *et al*., 2004; Lelieveld, 2021). Despite having, by his own account, coined the term on the spur of the moment, Crutzen's spontaneous intervention coined a *bon mot* that has gone on to generate considerable debate, but also widespread currency in discussions around the future of planet Earth. Thus, the International Commission on Stratigraphy (ICS) was approached in 2008 to consider the merits of identifying the Anthropocene as a distinct geological sub-division of the Quaternary period and as a successor to the Holocene epoch. As of March 2021, the ICS continues to debate the proposal, despite enthusiasm to accept it by its own Anthropocene Working Group. This means that the proposal remains a subject of controversy whereby differences centre around the origin of the Anthropocene and whether a break in the geological column marking the end of the Holocene can (and should) be identified.

Despite this controversy, it is clear that concerns about biodiversity and extinction as well as hydrological and atmospheric sustainability mean that the Anthropocene has gained ground as an organising concept for scholarly research that embraces geology and related Earth sciences but is not dominated by them as foundational disciplines. Indeed, being an atmospheric scientist rather than geologist, Crutzen's original formulation was implicitly interdisciplinary and the increasing adoption of the Anthropocene as an organising concept for planetary concerns can be seen as marking the ascendancy of holistic approaches found in multi- and transdisciplinary scholarship. For example, the Interdisciplinary Research Network on Environment and Society supports diverse research projects on the environment (Elworthy *et al*., 1995)

while the On Sustainability Research Network (2021) is '...brought together by a common concern for sustainability in a holistic perspective, where environmental, cultural, economic and social concerns intersect'.

Beyond scholarly and learned circles, the Anthropocene is gaining popular currency as a focus for discourse surrounding environment, sustainability, and action, including on the climate (Krogh, 2020; Vince, 2014). As Greta Thunberg (2019, p. 17), in her book *No one is Too Small to Make a Difference,* states: 'Homo Sapiens have not yet failed. Yes, we are failing, but there is still time to turn everything around. We can still fix this. We still have everything in our own hands'. The argument that sustainability and its constituent parts represent urgent issues has also sparked interest in the concept in 'educational circles' and promoted calls that educational institutions have a responsibility for addressing environmental questions (Baughan, 2021) and need help in reimagining a new planetary future (Karen *et al*., 2017). This includes a reimagining of educational subjects (Wallace *et al*., 2021) and pedagogies (Jickling *et al*., 2018), including discussions of what should be included in formal curriculum policy (see, for example, the Canadian Sustainability Curriculum Review Initiative by Learning for a Sustainable Future, 2021).

Nonetheless, the Anthropocene signals a paradigm shift in the way that human relations with the natural world are understood, the living and nonliving things (see, for example, Keulartz and Bovenkerk, 2016). However, it is a shift with challenging implications as the Anthropocene puts our human-historical understanding of world history in alignment with the time of geology or 'deep time' (Chakrabarty, 2018). So, although for the first time ever we have a concept that potentially allows us to connect what we do in the everyday to events that happen on vast, geological scales, we are far from being able to grasp what this means should we adopt the idea of the Anthropocene, let alone how it may support us taking concrete action. However, the *bon mot* shines a light on so many of the assumptions and practices that accompany anthropocentrism, the meaning of nature, as well as the relationship between humans and the natural world that it appears worth exploring what the concept may offer, especially for the upcoming generation.

Ecology and education in a 'post-human' world

Today's children are born into a world that is dependent on unsustainable carbon production manifesting itself in global warming, disease pandemics, species endangerment and extinction, and reduced plant biodiversity, a life '...characterized by uncertainty, unpredictability, genuine chaos and relentless change' (Albrecht, 2016). Thus, some, for example a report commissioned by the World Health Organization (WHO), the United Nations children's agency (Unicef) and the medical journal Lancet (Clark *et al*., 2020), argue that 'The world is failing to ensure children have a "liveable planet"…' (Dehghan, 2020).

There have been many calls for action and many attempts to 'educate' people on sustainability, carbon consumption and a 'greener' life in general. Schools and educational institutions have introduced sessions and activities to 'teach' children about 'reduce, reuse, recycle', although teachers often lack support and experience in the area, and current curriculum policies and priorities lay elsewhere, in mathematics, science and language, and thus put environmental education at the margins of programmes and sessions. In addition, what is being taught is often determined by those in power – governmental advisers, policy makers and school boards (Kirylo and Nauman, 2010). However, the recent global protests by school children on climate change have highlighted the need for schools and education to take into account the role they can play in validating children's voices and foregrounding their ideas. An eco-pedagogical education could be a way to help us listen to upcoming generations and reflect on our current habits to reimagine some of the exploitative consumption cultures that pervade our lives.

In this section, we bring together the notion of the Anthropocene as a way to understand how humanity acts as an ecological force which changes the Earth's structure and processes with posthumanist perspectives to explore what an eco-pedagogical education could look like and how it may contribute to a more sustainable future that takes into account the complex intersectionalities our world presents.

Quantum Entanglements

Our lives are dependent on, and enchantedby, processes and products that run on carbon; for instance, the ways in which we consume 'places' are embedded in a holiday industry whose carbon footprint is said to be increasing year on year, '...accounting for about 8% of global greenhouse gas emissions, with transport, shopping and food as significant contributors. The majority of this footprint is exerted by and in high-income countries' (Lenzen *et al*., 2018, p. 522). It is within these everyday excerpts of a consumerist culture that a posthuman perspective can help to understand the significance of human living through 'mattering'. Barad (2007, p. 308) summed up this viewpoint when she stated:

> ...phenomena do not merely mark the epistemological inseparability of observer and observed; rather, phenomena are the ontological inseparability of agentially intra-acting components … phenomena are the ontological entanglements of objects and agencies of observation. ...it is the ontological inseparability or entanglement of the object and the agencies of observation that is the basis for complementarity.

The relationalities between humanity's existence on the planet and the irreversible effects it is causing can be illustrated purposefully through Karen Barad's (2007) arguments and posthuman philosophy of quantum entanglements. We refer to quantum entanglements as 'posthuman' as it helps discuss how what we think of as being 'human' is closely entwined with non-human or more-than-human elements which harm ecosystems and are becoming hazardous to our own health. As Barad (2007) has argued, viewing the world as a whole rather than as composed of separate realms offers a new epistemology, ontology and ethics, enabling us to change our understandings of space, time, matter, causality, agency, subjectivity and objectivity. This includes a reframing and reconfiguration of how nature and culture interact, to take purposeful action.

An example of the interconnectedness between human existence and non-human materials can be explained through the harnessing of childhood experiences and child play, and their dependence on plastic consumption. For example, children, when starting to explore the world, are given 'safe objects' to play with. In current times,

these are often plastic toys because they are generally considered 'risk free'. These toys, however, are often produced with materials and through processes that are far from being safe, neither for those that produce them nor for those that use them. They contain harmful chemicals and they contribute to plastic pollution creating microplastics that are a concern for human health as they are found everywhere, including in human organs (Forster, 2020). As such, these toys produce exactly what they aimed to avoid in the first place: a human health hazard.

Debates like these are important because the interdependence which exists between our experiences, in this case childhood experiences of learning, our actions and interactions with the environment, in this case play and plastic, are reinforced and embedded in systems of schooling, reinforcing our unsustainable carbon cultures through the use of 'vibrant matter, such as, Lego blocks, dressing up costumes and plastic figures' (Osgood and Robinson, 2019, p. 2). A posthuman theoretical approach can help analyse and make sense of the current situation, but most importantly, it provides a discursive backdrop for reimaging educational futures, and the creation of alternative learning and teaching approaches. Further, thinking through entanglements offers a decentring of teachers and learners as 'unified rational subjects' which is propped up on the tenets of Enlightenment. This is important, because if we want to challenge the current rationalities of how we are approaching the world – and education – then we can no longer accept the white, European male norm as an 'ideal' – or the artificial, gendered, ableist and ageist toy as necessary – and instead need to focus on 'others' and the 'relational becomings with animals, lands, atmospheres, ideas and things' (Hickey-Moody *et al*, 2021, p. 2).

Based on these premises we propose eco-pedagogies as a method and practice that can help us reflect on how we are more-than-human, and how the messiness and complexities of our existence has anthropocenic consequences. However, if we only consider the Anthropocene as a phenomenon on which to base our ideas, we still run the risk of remaining too centred on the human impact and our human doings. Instead, through posthumanism, we can open ourselves to the entangled dependencies that create all we currently know. Therefore, this paper continues to unsettle some of the accepted processes and products we associate with education, whilst also contesting some of the ways of knowing that education is designed to perpetuate. We outline how

people 'become' through different forms of carbon consumption, and that understanding these relationalities and dependabilities is essential if we are to think alternatively and generate an education spearheaded by eco-pedagogical interventions.

Reimagining education: eco-pedagogies

Posthumanism allows us to start from the acknowledgement that the world does not need humans, although from an anthropocenic point of view, it is currently shaped by human life, and its necessities and excesses. So, then what education do we need and what do we want to achieve with that education? Should there be an ecocentric approach to education? As recent developments show, shifting our focus from neoliberal economics and consumption to environmental issues is not enough, but rather, we need a more radical shift from human to more-than-human. To this effect, in what follows we illustrate this argument further by presenting what an eco-pedagogical education could look like through some current examples. We argue that it is necessary to challenge the existing understanding about schools and schooling if eco-pedagogies are to be considered as a critical catalyst in education.

As a starting point, we take the call by Sutoris (2021) for 'Anthropocenic skills' to be placed at the centre of the curriculum in Higher Education:

> ...the role of universities must go far beyond coming up with new technologies or even teaching critical thinking. What is needed is a wholesale re-imagining of the world, and this requires education that helps us envisage alternative futures, gives us tools to communicate our visions and agonise with others over their visions, helping us realise our agency as *political* beings.

This call might easily be extended to primary and secondary education, and even pre-schools. However, while sounding reasonable, it demands a discussion of what role humans might play in the planetary future they imagine, and why we see ourselves as central in this (the argument of humans as political 'animals' with the power of speech and moral reasoning). Thus, this call needs to be extended so it includes a discussion of more fundamental matters: the relationship between humans and the natural world.

Jandric and Steinberg (2021) propose a pedagogy that acknowledges the complex realities we live in and the relationship we currently have with Nature. This includes a recognition of the profound impact that our purchasing-obsessed culture has on our children and that the experience of childhood has been reshaped into something that is prefabricated (see also Steinberg, 2018). They imagine a pedagogy that enables a deeper engagement with who we are and what we want to become. However, what exactly shall this pedagogy look like? In the following, we explore what 'the walking curriculum' and 'Der Spielzeugfreie Kindergarten', may offer as eco-pedagogical interventions that help learners to connect and make sense of the different worlds they inhabit and encounter.

Case study 1: The Walking Curriculum

Walking as a method for the posthuman classroom, and for achieving a global and planetary justice may sound simplistic as humans have explored the world upright, on their feet, for centuries. However, walking, beyond its ability to take us from one place to another, allows us to see and experience the world. It decentres the individual, placing it in direct relationship with the environment. As Judson (2018) argues, it helps learners in developing an emotional connection to the world that surrounds them, giving them a sense of place.

> Sense of Place is what can change how our students understand the world of which they are part - it can help them reimagine their relationship with the natural and cultural communities they live in (Judson, 2010, 2105 cited in Judson, 2018, p. 1).

This potential, if harnessed, may help facilitate what Barad's (2007) posthuman philosophy of quantum entanglements proposes: a reframing and reconfiguration of the nature-human dichotomy, one in which each particle of a group cannot be described independently of the state of the others. Thus, walking may present an important first step to reconnect to the world we live in, especially when considering that 'Having sustainability-related knowledge and skills is not enough to change behaviours' (Shepard, 2018, p. 26).

Walking as a pedagogy is emotional work, a quest for affective attachments to the natural or more-than natural world (see also McLaren and Jandric, 2014). So, let us

reimagine not only what we teach, but how we teach. The upcoming generation deserves a better story than the one being told with the big, fact gloomy title of 'Generation Alpha' (Lavelle, 2019). Today's children need to be allowed to 'find their feet' and 'walk their own paths', not as the generation dominating the world, but as the first children born entirely in the twenty-first century taking an active role in shaping the planetary future in tune with their surroundings. So, if we start shaping a different, more holistic story and scaffold it with a different pedagogical approach, then future generations will not only have a closer relationship to the planet they live on, but they will be able to share the awareness that our sense of humanity is inextricably linked with all living and nonliving things. The awareness of these posthuman entanglements can create more impactful changes to how we live our lives, challenging unsustainable carbon cultures and creating new habits in everyday life than the simple teaching of sustainability.

Case study 2: Der Spielzeugfreie Kindergarten (the nursery without toys)

The second case study focuses on a project created by Rainer Strick and Elke Schubert (1996), both public health officers who worked with adults suffering from various forms of addiction: Der Spielzeugfreie Kindergarten. Their project arose from their work in rehabilitation and how addictive habits start in early childhood because of reduced opportunities to develop resilience. They wanted to show that children can play happily and creatively when they are not being 'suffocated' by their toys. One of the nurseries that has been following this project for the past two years is the Friedrich-Engels-Bogen nursery in Munich, Germany. However, this project was also trialled in nurseries in the United Kingdom, including Bristol and Ilminster where nurseries have had 'no toys' trials, with one nursery making the changes permanent (BBC News, 2019).

The reason why these experiments matter lies in what Barad (2007, p. 132) has framed as the importance of going beyond language (or 'talk'):

> Language has been granted too much power. The linguistic turn, the semiotic turn, the interpretative turn, the cultural turn: it seems that at every turn lately

> every ‘thing’ - even materiality - is turned into a matter of language or some other form of cultural representation.

Refocusing our attention creates opportunities to reimagine how children experience their childhoods within settings and educational institutions. Staying within a posthuman approach to eco-pedagogies, it is not enough to foster ‘discussions’, as this still does not break through our interdependencies with plastic, as it is in the case of childhood and children’s play. We need to radically change our entanglements with materialities in education if we are to create pragmatic alternatives that help us live sustainably. Thinking through quantum entanglements enables us to reflect on how important parts of our humanity are characterised by the more-than human. In the case of childhoods and children’s play, the way in which we think of children as needing toys to develop cognitively, or even to have healthy childhoods, or happy childhood memories, aids the creation and consumption of unnecessary plastic waste, in many cases single-use plastic toys which are not recycled or disposed of appropriately nor manufactured in sustainable manners.

When removing toys, the nurseries reported how younger children quickly developed new play strategies and were actively involved in group play, using everyday ‘objects’ collected from home or native to the classroom such as chairs, tables and mats (see, for example, BBC News, 2019. Whilst younger children adapted very quickly within a day or two of the project starting, older children took longer to develop play strategies but they also dealt with the change with creativity and resourcefulness. In both groups, collaborative play was a strong feature of how children responded to a no-toys environment, a type of play that needed more instruction from adults and teachers prior to the project.

While the no-toys nurseries have not solved all issues related to the material realities of education, they definitely generated a new way of thinking about childhoods which offers a decoupling from plastic toys. This can mark a rethinking, in educational institutions and in wider society, of the key ways in which children are constructed as enacting their childhoods or developing their imagination and skills. one which can help to contest the current harnessing of childhoods and plastic consumption. In this way, materiality in childhood matters and, as an example of an eco-pedagogy, it shows how tangible it is to generate a change in unsustainable carbon cultures, beyond an

anthropocenic understanding of our impact on planet Earth, but actually changing the very carbon cultures that have become institutionalised and fail to generate eco-pedagogical education.

Conclusion

The world into which children are born relies heavily on consumption, and on the industrial and commercial carbon processes used to manufacture those goods, including toys, which impacts our planet irreversibly. However, education has remained largely detached from wider discussions about climate change, that is until the recent rise of global protests led by Greta Thunberg. In this paper, we suggested that education needs to participate more actively in this discussion and create eco-pedagogical spaces where curriculum can open a more critical understanding of new environmental and consumption imaginaries. We examined the potential of adopting eco-pedagogies through theoretical notions departing from the Anthropocene to posthumanism. It is imperative that in education and school curricula sustainability is not reduced to another subject to teach. Instead, we propose eco-pedagogies/ecological education as an approach to thinking about and beyond our impact on the planet, embedded in Barad's (2007) posthumanist quantum entanglements as a way to bring about change in education.

An attempt to understand how our lives are enmeshed with commercial and carbon consumption cultures is inherently a posthuman exploration. Through the two case studies presented we aimed to break through the current approach to environmental education which is still too reliant on cascading information and scientific facts to children and young people. Instead, the case studies generate a sense of movement and a change in those very material relationships which coax us towards unsustainable carbon cultures. In the case of walking pedagogies, the paper sought to exemplify the importance of our sense of place and the potentialities in walking as reflection, walking as stoppage, walking as encounter with nature and walking as ecological practice. Moreover, through the example of no-toys nurseries, there is scope for critically identifying the many significant events and cultures which are intertwined with schooling, and foster needless consumption of harmful goods and products. Changing our human culture through eco-pedagogies is a posthuman inquiry since it is only possible through a diffractive analysis of the convergences and

assemblages between our everyday existence and other materials and non-human elements.

Whilst we continue to rely on technological innovation as a way out of the current global climate emergency, which has recently also turned into a health emergency, it is time for education and systems of schooling to create these eco-pedagogical spaces where we can go beyond an anthropocenic understanding of living on this planet. As children stand to inherit a precarious ecological future affected by our uncertain global climate, it is imperative to reflect on how education can help produce a more radical and practical way of living. Perhaps we should start from an acknowledgement that the world does not need humans, and if so, then how can this underpin curriculum and schooling? An eco-centric approach to education? As argued in this paper, shifting our focus from economics to environmental is not enough; rather, we need to break unsustainable relations between human cultures and the Earth's resources by forming human to non-human connections as a way to create new materialities and forms of living that reach beyond schools and schooling into a holistic education. This decentring legitimises all actors and the stories they have to tell – as humans and more-than humans: a world where many worlds co-exist.

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