Starting with trees: between and beyond environmental education

Abstract

This article explores learning about environments with a focus on starting with trees. The paper focuses on children and young people's perception of and engagement with trees, as part of a large grant which itself was part of the UK Treescapes programme. In this article, we attempt to move beyond notions of Education for Sustainability in that we start with knowledges generated with trees. We are concerned that current educational discourses tend to incorporate extractivist perspectives. They also focus on humans rather than the natural world as a starting point for research. Through our joint work, we begin a new conversation about what starting with trees might enable. We propose the concepts of dwelling, skilling and belonging as ways of 'starting with trees'.

Key insights

What is the main issue that the paper addresses?

The paper addresses the limited focus on Education for Sustainability and is concerned with what it might leave out. It develops an understanding of climate change education with a focus on trees and children and young people's relationships to them.

What are the main insights that the paper provides?

Drawing on experiences of children and young people we argue that it is important to work with the concept of diversity, both with children and young people and in methodological attuning to trees. Our key message is the important of starting with trees as a. mode of working within the field of environmental education with a focus on dwelling, skilling and belonging.

Introduction

Drawing together notions of *dwelling*, *skilling* and *(be)longing*, we ask in this paper what it might mean for us – academics, educators, learners – to 'start with trees' in co-producing environmental knowledges. On the one hand, to start with trees is to offer a constructive critique of other possible starting points when it comes to environmental learning.

We propose a focus on starting with trees. To start with trees might be to (attempt to) move between and beyond notions of Education for Sustainability that have often become entangled in problematic ways with neoliberal understandings of sustainability and economic development (Cachelin et al., 2015). To start with trees might also be to avoid the ways in which certain aspects of environmental change – like climate change, plastic pollution and desertification – come to dominate both popular discourses and concerns about the environment, and educational curricula, in part because of anthropocentric bias (Kopnina, 2014).

On the other hand, to start with trees is – in our conception – an attempt at a more open, inclusive, less clearly-defined way of working, playing and experimenting with environmental knowledges. To start with trees does not, for instance, mean to start with deforestation; it does not, of necessity, mean taking children into 'pristine' forested environments with some determinist views of the healing benefits of nature in mind (compare Louv, 2005); it does not have to be tied to the ways in which trees could sequester carbon (if only we could plant more of them). It *could* mean any or all of these things but it could mean much else besides. And if we attend to *what else* (Horton and Kraftl, 2006) starting with trees might enable, it might be possible to think and work with diverse, exciting, generative possibilities: potentially new, heterogeneous, even disruptive ways of relating with trees emotionally, bodily, affectively, artistically, scientifically (etcetera) - whatever those terms might mean in context (see, for instance, Nxumalo et al., 2022).

What if we start by simply drawing a tree (any tree)? Or start by modelling the roots of trees with pipe cleaners? Or start by telling stories about what might happen to a particular tree in the future? What if we start with movements of children and technologies as they attempt to measure trees through a whole range of techniques – some 'accepted' by tree scientists, others not? Or by using starting conversations about the soil in which trees grow?

Indeed, in thinking through all of the above questions, it might not matter too much if we start with trees – grasses, shrubs, rocks, plastics might all be equally interesting and provocative. However, trees are a good place to start in thinking and doing between and beyond environmental education: they are a key locus – symbol, even – of attempts to deal with climate change through carbon sequestration; and trees hold a special place in human cultures, replete with myths, meanings and the sense of rootedness-in-place they afford us. Therefore, this paper charts just some ways in which, in our work with teachers and children in schools in the UK, we have experimented in 'starting with trees' - and what the implications for curriculum, learning and teaching about the environment might be if we take such starting points seriously.

In order to grapple with the questions outlined above – and in order to outline an agenda for what it might mean to *start with trees in environmental education* – this paper progresses through three, carefully-chosen series of research materials from the *Voices of the Future* project. *Voices of the Future* was a large, forty-month, transdisciplinary research project involving a core team of 23 academics representing disciplines including childhood studies, education, applied linguistics, human and physical geography, ecology, youth studies, sociology, art practice, anthropology, landscape architecture, English and philosophy. The work was supported by the Natural Environment Research Council [NE/V021370/1]. Driven by a commitment to co-production, the wider team included partners from major, regional tree-planting agencies such as Mersey Forest and Manchester City of Trees, educators from a wide range of settings, youth workers and children and young people themselves (across our various sites, aged from 2 to 25). In the North West we worked with 12 families and 21 very young children, 330 primary and 30 secondary school children, and 61 young people. In Aberdeen we worked with 103 primary school children.

Although forming part of a larger UK research programme aiming to improve UK treescapes (environments with trees) for the benefit of the environment and society, principally through mobilising the capacity of trees to absorb carbon dioxide, this project took a rather different approach. Through a series of work packages and sub-work packages, across sites in northwestern England, South Yorkshire and Aberdeenshire, it sought to understand and co-produce *with* children knowledge about trees. Central to our work was a broad range of Grounded in philosophies of hope, the project also aimed to co-construct with children a range of plans, actions and (speculative) stories to address the (possible) future of trees and treescapes where they live.

Across these aims, we sought to attend to the *diversity* of children and young people's learning, knowledges, experiences and hopes for trees. On the one hand, this meant that we worked in depth (in most cases for a year or more) with large groups of children (up to 90) at each site, ensuring that we worked with a very diverse range of spaces and communities. These sites included: early years settings in South Yorkshire; a highly ethnically-diverse primary school in central Manchester; a predominantly white, working class primary school in Bolton; In Aberdeen we worked with children between the ages of 6 and 12 in an ethnically diverse city primary school in an area of high deprivation and a middle income suburban primary school on the edge of the city, several secondary schools and colleges in the Greater Manchester region; working with a group of around 20 recently-arrived asylum-seeking young people via a youth group in Manchester.

On the other hand, we developed, with our partners, a range of transdisciplinary methodologies that could enable us to start with trees. Some of the richness and detail of these approaches is articulated via our detailed case studies later in the paper. However, in broader terms, as noted above, this often meant spending a year or more at each site, carefully co-developing appropriate methods with children, young people and their associated adults. Often, researchers from multiple disciplines participated in research sessions at the same time, as we: explored with and trained children and young people how to do research with trees from different disciplinary perspectives; introduced 'scientific', 'social-scientific' and 'arts and humanities' approaches to working with trees; engaged children in a range of creative activities – from designing treescapes to writing stories about trees in the future; engaged children in planning, planting, caring and maintaining for trees, often in their school grounds or places proximate to where they lived; experimented with a range of lower- and higher-tech equipment (from laser scanners to iPads, and from notebooks to rulers) to derive manifold ways to 'measure' – or get the measure – of trees (Authors, forthcoming); attended, all-the-while, to the stories, memories, experiences, emotions and embodied interactions children and young people engaged in with trees – whether verbal or non-verbal.

In the next part of the paper, we briefly position our work and its contributions in respect of the large and complex field of environmental education. Thereafter, we recount in detail a series of carefullychosen and -curated case studies from across our research sites in order to draw out a range of key questions and considerations for starting with trees, between and beyond environmental education. Written by different combinations of authors, they are deliberately multiply-voiced and mediated, as we experiment with different written and presentational styles that we argue are necessary for witnessing the outcomes of our approach, outlined above (on the need for such styles in socioenvironmental research with children and young people, see also Kraftl, 2020 Bridge-Roads and Cleve 2017). Throughout, and in conclusion, we outline the broader implications of our work for (environmental) education scholars.

Looking between and beyond environmental education: literature review

There are many established fields of scholarship that critically evaluate environmental education as broadly understood (for detailed reviews, see Monroe et al., 2019; Rousell and Cutter-Mackenzie-Knowles, 2020). There has been a proliferation of research about Environmental Education, Education for Sustainability (and Sustainable Development), Outdoor Learning, Experiential Learning, Alternative Education and Forest Schools. In relation to sustainability, environmental and climate change education, the common terms used in the DfE strategy (2022), over emphasise economic values and less attention is paid to social and relational dimensional aspects, requiring a collaborative partnership among policy makers, teachers, educators, young people, and children (Dunlop and Rushton, 2022). The focus on environmental learning has tended to focus on the potential for human-oriented learning and the benefits to humans. For example, Environmental Education has been described by the American Association for Environmental Education, and quoted on the UK site as being,

...a key tool in expanding the constituency for the environmental movement and creating healthier and more civically-engaged communities. (https://naee.org.uk/so-what-is-environmental-education/)

This work has been accompanied by burgeoning theoretical perspectives, many of which have sought to challenge the notion that learning about environments and environmental change should be based on the didactic transfer of knowledge to learners in traditional classroom settings (Trott and Weinberg, 2020). Many, indeed focused on children and young people as agents of change (see for

example Mackey 2012). In part, this involves de-centring 'teachers' as providers of stable environmental knowledges, towards more discursive, participatory, inclusive, interdisciplinary and creative approaches to environmental education (BERA Research Commission, 2021). In part, though, this means moving beyond the classroom, as Outdoor Learning and Forest School settings privilege forms of learning through active 'connectedness' with specific ('natural') places, such as local woodlands – often involving activities like walking, playing, climbing, collecting and making in the generation of 'place-responsive pedagogies' (Kraftl, 2013; Lynch and Mannion, 2021).

Meanwhile, Common Worlds conceptualisations of environmental learning seek to question the very foundations of what it means to be a human (and a 'learner') within environments (Taylor and Pacini-Ketchabaw, 2018). Where Forest Schools might still view (child) learners as individuated human subjects, Common Worlds framings deploy feminist new materialist and posthumanist theories to position children as porous, emerging only ever in relation *with* the world (see for example, Crinall and Somerville 2019). Although still profoundly place-based and place-aware, Common Worlds theorists and pedagogues are thus more interested in how children interact, are entangled, and become-*with* the more-than-human flora, fauna and flows with which they have contact (Land et al., 2022). As the Common Worlds collective (2020: 2) argues in a recent paper for the UNESCO *Futures of Education Report*, "this requires a complete paradigm shift [for environmental education]: from learning about the world in order to act upon it, to learning to become with the world around us".

Whilst overlapping to some extent, each of the above approaches offers a different framework for understanding the relationship between learners, learning and environments (and particularly environmental change). Moreover, to differing extents, each offers a critique of contemporary approaches to environmental education as it is set within the disciplinary, regulatory and political traditions of education systems in countries like the UK (Howard-Jones et al 2021). As indicated above, a key outcome of this critique is that increasingly popular forms of environmental learning now take place 'outside' the classroom, if not the curriculum itself (Jickling et al 2018). Yet in this paper, we want to think again, and to think further, about what it means to engage in diverse forms of learning, doing, feeling and knowing (about) trees. For our work, these diverse literatures prompt three considerations and questions – about *dwelling*, *skilling*, *be-longing*.

Firstly, in terms of *dwelling*, we demonstrate later in the paper how different disciplinary curricula (especially science) cannot (fully) accommodate our co-production work in the *Voices of the Future* project. It was hard to find spaces and times in which our work could settle or sit comfortably within or alongside the curriculum in schools especially when different schools have different interpretations of following and enriching the statutory curriculum, and it is even harder to imagine how it might be incorporated in a formal sense into future curricular developments. Part of the reason for this was that we wanted to consider more deeply what it was like to *be*, with treescapes, in diverse forms and styles. Critically, this did not mean privileging certain ways of being (and acting) within carefully-chosen ('pristine') treescapes in order to afford socio-culturally narrow forms of nature (re)connection (Kraftl et al., 2019). Rather, it meant proliferating ways of *being with/in* treescapes with diverse ages and groups of children, in diverse kinds of treescapes, and in places that might not (yet) be considered as treescapes (school classrooms, playgrounds, urban streets). In this paper, then, we seek to extend beyond notions of nature-connectedness, place-responsiveness and doing-/being-with, in order to explore what the concept of *dwelling* might afford environmental education.

In this paper, the idea of dwelling is drawn initially from Ingold's notion of the 'dwelling perspective' first introduced in 'The Perception of the Environment' (2000) which troubled a housebound understanding of what it is to dwell, and was the starting point for rethinking the place of people in the world and the relationships between humans and non-humans in the world. Reflecting back on this idea sometime later in 'Being Alive', Ingold, (2013), reiterates the way in which a 'dwelling perspective' opens up the notion that humans 'inhabit' (ibid:71), rather than occupy the world, working 'with materials,rather than just doing to them,' (ibid:10) Distancing himself from Heidegger's ideas of dwelling which separates humans from other animals, Ingold makes clear that a 'dwelling perspective' draws instead the role of movement in the eco-psychological approaches to perception of Gibson (1979, cited in Ingold, 2013: 11) and Merleau-Ponty's phenomenological approach to perception in which humans are 'stitched into the fabric of the world, ' (ibid:12). In this reflection, Ingold reconfigures the ideas of the dwelling perspective from being cosily placebound to situate the dwelling perspective within the expansive movements of everyday life and activity of humans and non-humans in the world, putting an emphasis on 'wayfaring,' (2013:12). A dwelling perspective in which humans and non-humans live and move, 'skilfully in and through their surroundings,' (ibid:10) implies that in so doing people are shaped as much by what they live amongst as they are shaped by people.

In the context of exploring how children and young people along with adults in schools encounter, make sense of and learn from/with/about trees, both the notions of the dwelling perspective and wayfaring, underpinned by the development of the skills to 'live and in through their surroundings,' (ibid) are pertinent to our work. Skills in this sense are multifaceted and do not follow meritocratic hierarchies, drawing from Bernstein's example of a skilled blacksmith, who despite creating a different arc of the hammer on each blow, always hits the spot because they have the skill to tune their movement,(Bernstein cited in Ingold, 2013: 58).

In contrast to current global educational policies which focus attention on attainment, (PISA - PISA (oecd.org) which fosters a competitive and often reductive perspective on learning, Ingold's writing suggests a slow and deep development of experience, skills and knowledge which come into being through encounters between humans and non-humans of different ages and dispositions, through practice and repetition. His ideas echo Alison Clark's call for slow pedagogies (Clark, 2023) which although stemming from working in an early years context is relevant to people of all ages. Our work with children, young people and trees has allowed everyone to slow down and make time to be curious, to question, to listen, to learn together and reciprocally between children, trees and adults. Our approach has made it possible to recognise when being still or to move about heighten our perceptions of being in a treed world. It also calls into question, how open schools are to break down the dualism between 'vocational skills' and curricular knowledges.We mean this in two inter-related ways: on the one hand, in terms of the ways in which children and young people (especially) found ways to dwell (or not), feel comfortable (or not), settle (or not) – even if momentarily – through the course of our co-production activities; on the other had, in terms of the ways in which these forms of dwelling recursively dwelled, sat or fit within (or not) the spaces, rhythms, knowledges and practices of the schools we worked with, and their curricula.

Secondly, in terms of *skilling*, we argue later in the paper that we were struck by forms of doing and knowing that are either rarely valorised, or that are actively excluded, from school curricula. We use the term 'skills' deliberately and provocatively since (in the UK) there are increasing concerns about a shortage of skills for the Forestry sector and – increasingly – about the lack of diversity within the Forestry workforce (particularly in terms of gender and ethnicity). Whilst our project does not seek

to address this 'skills gap', the notion of skilling more broadly understood is helpful in extending debates about environmental learning beyond those covered by the literatures above (where questions of 'skills' are rarely broached). We want, for instance, to explore and amplify instances of where 'traditional' or 'working class' skills (and knowledges) about working with trees, treescapes and wood – which are often fairly localised – are being and might be a part of school-based learning about treescapes. In an interview with a forest educator (conducted by the team in March 2023), he described how rare the skills are that are connected to woodlands, and he argued that these need to be more visible within schools. The educator, who was himself a Forestor, talked about the skill of coppicing. He said that the children,

'just come up here, learn some stuff, build some stuff have a good time and enjoy with your friends and it links with those children who don't have that contact with nature, like when we coppice this hedge, i need it a lot more... that's why we do other coppicing going because they may not know how to live with nature and keep it alive'. (Interview 14th march 2023)

We are concerned about the ways in which 'tree skills' are positioned within the sector and we wonder how they might open out opportunities for learning that may resonate well with some learners – that may enable them to dwell more comfortably with trees and tree-knowledges – than do other forms of environmental education. We also want to avoid romanticising those forms of knowledges and skills (who and what might 'traditional' ways of working with and knowing land exclude?), and evade any sense of a dualism between 'vocational' skills and curricula knowledges. In other words, we want to ask how a move to considering skill-*ing* – understood as but also beyond 'traditional' forestry skills – challenge, augment, supplement or otherwise develop environmental education in school curricula?

Thirdly, our conceptual work stretches to incorporate *longing and belonging (articulated as '(be)longing')* in ways that weave time, place, humans, and non-humans providing unexpected diffractive configurations. The project's emphasis on the future is anchored in learning to attend to children's past memories, experiences, and histories as well as their present being and becoming in the world (Horton and Kraftl, 2006). This connection between the past, the present and the future stretches life like a story in an act of 'longing' (Ingold, 2018: 21). However, we use longing in a slightly different way here. Unlike Ingold's focus on stretching life 'along a line', we break free from lines as they risk keeping us in the epistemological pursuit of coherence and convergence (Deleuze and Guattari, 1983). The longing we embrace is stretching in regular and irregular shapes, following the rhythm of children's entanglements in this research assemblage. It is a tool to tie together and yet branch out.

In the remainder of the paper, we introduce case studies from across our research sites, which draw together and extend our discussion of dwelling, skilling and (be)longing, above. Our approach is to allow – to some extent – the case studies to 'breathe', attending to the multiple rhythms, mediations and performances that emerged when starting with trees. In the paper's extended conclusion, we draw out the implications of the case studies more programmatically.

Learning how to be in the world: tree as teacher

In this small example we draw on observations and films co-created by children in a small patch of woodland adjacent to a primary school playing field in Bolton. Here we hone in on a semi-rural school, which was located adjacent to a town in the North West of England. Here, we developed, with the children, a project called "Trees n'Us" which was concerned with trees. In partnership with

Manchester City of Trees, a tree-planting charity and with the support of the year 3 and 4 teachers in the school (children aged 7-8, n=90) we worked intensively in the school to support a tree-planting and tree-exploring project. Alongside tree planting, we worked alongside a trained Forest School teacher, who encouraged the children to encounter trees through free play in a series of Forest school sessions within the school day. We documented these sessions and from these, developed an understanding of a relational sense of belonging which was both multilingual and sensory, experienced through action and experience. This sense of belonging was actively constructed through the interaction with the woodlands.

The writing below was created as a response to spending several afternoons with children and a forest educator in the space. At times it was chilly, and we found it difficult to concentrate because of the cold. The children's responses to the woodlands constituted a commentary on how the woods could become methodologies for learning. Here we write as the woodland, that teaches us how to move within it and learn from it. The woodland-as-methodology exemplifies how woods exercising their agency afford opportunities for children to learn with/from nature. The woods, rather than being a passive object, actively contribute in the ongoing/ness of their encounters with children (Taylor, et al., 2021). The woods also become co-teacher (Blenkinsop et al., 2018) and assist the forest school educator in enabling – in *skilling* – children to understand their ecological relations and *dwelling*-with nature, rather than (purely) seeing nature-as-resource or as a detached object of scientific knowledge.

Children roamed freely in the school woodland. Moving away from didactic modes of learning within the concrete walls of the classroom children learn through a process of self -discovery (Ingold, 2013). During the process, trees, children and other human and more-than-human materials and bodies became the part of process of the learning about/with nature. Children were not told by their forest school teacher, Richard, about what to do. "Instead, the focus very much was on how to experience things. This enabled curiosity among children to "what to look for" in the Forest School teacher's words, by watching, listening, feeling, and paying attention to human and more than human materials and bodies.

"You get to climb trees and if you fall over, you don't hurt as much" (Richard, forest practitioner).

"It is fun to take leaves off the ground and make things out of them so it's really fun" (Child).

In this exploration we explore what movement feels like around trees. Using Tim Ingold's *Being Alive* (2011) we explore how movement is re-configured through the branches and bark of a tree. The child touches with hands and feet, 'we touch with our hands as well as our feet' (Ingold 2011:45) and the surface of the tree affords the climb. While we tend to imagine that things are perceived from a stationary platform, when watching a child climb a tree we ask: how does the feel of a surface differ? How is perception different from the point of climbing a tree? If 'Movement must be *felt*' (Ingold, 2011: 60) how is this feeling different?

Tree climbing child

Grasp and move the whole body up

Move up toe in tree, toe up and other toe up at the same time.

Arm in the place where the tree has a space,

Down Take a step back, slide back Start again, one foot up, toe in bark Up two feet together Down Up down two feet on bark with Arms on tree Up two feet on tree Down

Tree climbed with child Has foothold in bark Shins of legs feel the bark Arm in space where the tree branches out



What does tree-climbing teach a child?

"If you stop them getting stuck, they will never understand how they got stuck. If they don't understand how they got stuck, they have no awareness of the world around them." (Richard, Forest School practitioner)

Understanding the relational-ness of children and trees as they *dwell* together means attending to the child+tree, seeing how the two are intertwined through embodied *skills* (or their lack), and attending to their histories, relations in a particular moment and place (Ingold 2011), which in turn articulate a sense of *longing*: to climb and be climbed.

Soil Stories: shifting pedagogic registers.

In this case study, we offer glimpses into learning with trees as part of a whole-school Interdisciplinary learning (IDL) project, Our Local Area. As we suggested above, starting with trees is in some ways vital, but in others arbitrary; it enables forms of dwelling, learning and skilling with other (related) matters, with which we could equally have started, but with which we engage. In this case study, we think with *soils* via a fusion of scientific techniques and technologies, memories and the proliferation of *skills* of attentiveness and *dwelling*-with soils, thinking through the capacities of soils and how we and other organisms come to know and care for them (Puig De La Bellacasa, 2015; Salazar et al., 2020).

The primary school is on the edge of a northern Scottish city, retreating farmland skirts the area around the school including 3 straggly pockets of mature trees; the remnants of shelter belts planted to protect the ploughed fields of nineteenth and twentieth century farms. The Treescape's team have been working with classes across the school from primary 2 to 6 to explore their local area from the perspective of trees. They have compared the area where they live and go to school today with what their area looked like 50 and 100 years ago, and worked out where their houses which were built in the 1980s and 1990s would have been on the old maps of farmland.

This vignette also explores the decentring of teachers and other adults as providers of knowledge and the emergent qualities of learning which particular modes of enacting the curriculum can support (Pahl and Pool 2021).

Framing

It is a cloudy, dryish day in May with intermittent sunshine, the air is cool, and the ground is damp underfoot. A trail of 8 -9 year of olds have walked with the treescapes team, their teacher and classroom assistant stopping from time to time to notice the changes on the beech trees and the emergent blossom on the cherry and hawthorns. We are in a small patch of woodland on the edge of an open parkland where children come to play and build dens out of school. The class is split into two groups, and today we are learning about soil.

We wend our way down a slope, bigger children and adults stooping to get under branches until we reach the edge of a boggy bit at the bottom where our fieldwork will take place. Children are milling about paddling the mud beneath their feet wating for the workshop to begin.

'Today we are learning about [/from/through] soil [mud]'

Ed is our Treescapes scientist, I am his assistant for the day.

Ed: 'Why find out about soil?'

Children: 'Animals, ' I think I saw deer footprints...' 'I saw a fox...'

Ed: 'Trees like different soils. What's in soil?'

The boy next to me starts to tell me about how the soil was different in India, that when he goes to visit relatives it is very hot, and very dry [in contrast to the soft, boggy surface we are standing on] in fact it was so hot his granny let him have ice cream every day.

Demonstrating

Ed has brought the tools he uses for his fieldwork, an auger, distilled water, beakers, Ph meter, the blue meter, moisture monitor, Munsell Soil Chart and recording sheet.

Ed: 'Why do we investigate soil?'

Child:' to make sure its healthy'

Ed: 'what type of plants grow?'

Ed demonstrates the process of creating a soil sample. He begins by using the auger and shows the children what came out. They come up close and look intently....[I am watching the children's feet puddle the mud, rocking from side to side feeling the damp, glutenous mud squelch as they stand and watch Ed.]

Pointing to the earth in the bucket of the auger, Ed notes to the class, '.....Clay, stones, rotten things...'

Ed's explanation of scientific terms and equipment and purposes are child-friendly and children are making links between recording sheet and equipment.

Sometimes I ask Ed a question,

Liz: 'Ed, can you tell us what makes your lab water 'neutral?'

Ed has a great analogy with bottled mineral water. He asks the children if they know what is in bottled water as well as water? They tell him about minerals listed on the label and that water is H2O. Ed explains that if his lab water was in a bottle there would be no minerals listed, nothing except water.

Ed explains the Ph meter and what kind of reading he expects because the soil is from boggy ground. With a bit of prompting, children are able to come up with everyday examples of what is acid. I don't think anyone understands the blue meter, as it measures the concentration of things in the water. Looking at Ed's diluted solution, a child says, 'it looks like coffee.'

Moving out: proliferating soil knowledges

Now excited groups of children have a go at the auger to take their own samples, from different sections of the slope. Their teacher, a soil scientist in previous life, is very involved. She calls out that her group have a worm in their sample. The children observe the different colours of soil in their sample 'light at the top, darker underneath.' There is excitement as their teacher recalls just how much she loves the Munsell soil chart, she and the children together are discussing which shade of colour from pale cream to dark chocolatey brown best matches their swatch of soil from their sample.

The expert is everywhere as the children use the auger, to collect a sample, smear a bit on their recording sheet, create a soil solution, measure its pH and record the number form the blue meter and the percentage of water contained in the area that the sample was taken from. Their teacher encourages them to make predictions as to which part of the slope will be driest and whether there will be a difference in the pH from different parts of the slope. Like Ed takes his samples back to his lab, the children will be taking their recordings back to the classroom and will be using the data which they have collected to create graphs to represent the samples taken from different positions on the slope, like Ed they are doing science and maths in the 'real' world.

Mud playing, mud getting along with children

With soils still in mind, these pieces of writing from Bolton and Aberdeen produce mud as a mode of engagement. The intra-action of mud+child joins bodies and materials together and splits them apart

(Ingold 2013). This work takes from Ingold (2011) the idea of perception as connected to the object, to the 'vibrant matter' of the woodlands (Bennett 2010). Here objects teach us how to learn and how to feel our way into the woodlands. We can't quite grasp what it feels like to slide in the mud and break the sticks, or to squelch in it with wellies and fall over.

Bolton

A group of three young girls started playing with the mud. The girls' movement with/ on the mud turned into playing, jumping, and stamping. The mud as active material invited girls to feel itself closely through their touches and senses and become part of the mud world (Ingold 2013).

The girls grappling the chunks of the mud on their hands.

The mud inviting the girls to place parts of their bodies on its own body.

One of the girls stretches her legs and becomes part of the mud.

Next to her is another girl sitting on the mud and holding the mud in her hands.

She slowly starts getting up and looks at the mud staying on her hands.

She bends her knees and touches the mud. She then stood up, slowly leaving the hugging body of the mud and starts tapping on the mud with her boots.

The other girl joins the jumping game.

Both girls move their bodies around in a circle, jumping up and down along with the body of the mud.

The mud jumps up and down along with girls and girls' boots also joining the jumps.

The mud stays in the air for a while and then falls on the ground.

The third girl watching the other two girls.

Later, she joins the moving crew with the mud and with girls. She slowly walks on the mud, jumps on the tree log, and watches girls and the mud walking and jumping.

She jumps on the tree log, standing and watching, walking, stamping on the mud, seeing, and feeling the mud on their hands.

Girls being part of it and letting the mud being part of them (Ingold 2013) and engaging selfdiscovery mode of learning through playing the mud. As we watched, adults in a play space, we were drawn through the children's engagement with mud to their engagement with twigs.

The girls playing with twigs, picking mud from the ground, carrying the mud on twigs, and gently rubbing the mud on the surface of the tree log.

Making a thick layer of the mud on the tree trunk.

Working together, one can hear girls whispering and talking about layers of mud on the tree log. Hearing small voices of the mud when it rides on the twig to be placed on the tree log. The mud sticking and getting along with the tree log. At the same time being moved in a circle on the tree log, touching twigs and human hands.

Aberdeen

Throughout the time children are engaging in the scientific, systematic sampling of soil (see 'soil stories', above) and recording its texture, colour, pH and consistency, children are carrying out their own embodied explorations of the soil/earth/mud beneath their feet.

In the bog: a girl in pink and black spotty wellies – squelched until she fell over and in, there's lots of laughter from the child and her teacher, who helps to pull her out minus one of her wellies.

While Ed is demonstrating how to use the auger, one boy is intently watching, and two others are watching each other and testing out the bog beneath their feet, one goes right in with one foot and squelches, the other in wellies, also keeps testing.

Another small group of children paddle the mud. Feet engaged and eyes watching their feet beneath them.

After completing their soil sample, one group asks me of they can explore...they head off to the burn which runs at the other side of the bog.

Playing dens, making and learning

Children learn about coppicing, den building and hedgerow making from the coppiced wood. the wood is coppiced from mature trees planted in the forest school. Is dwelling a tentative, precarious form of *dwelling*, creating a site for *belonging*?

This is a way of enabling children to learn to live with nature in harmony to help it live longer without exploiting it, as the forest teacher (Richard) in an interview filmed by us explained.

"We don't cut down the tree, we coppice trees and we can use this coppiced like these hedgerows" (interview filmed on 14th March 2023).

The examples of mud playing and den making let children manage their own personal risks, to selfregulate and understand the value of group work. They also enable the children to learn traditional *skills*, honed over centuries in this region of England – but without necessarily being weighed-down by the history or any perceived 'rightness' of those skills. As we watched, children were going into the den and coming out of it, holding bricks and tree twigs. These are also about (literally) constructing the curriculum as a combination of understanding the trees, understanding the relation on a set of trees and children and how these relations can be seen as valuable. These could be described, in the words of Forester Dave Armson, from Mersey Forest as, 'woodland methodologies' (nd in conversation).

This understanding of human and tree relations is generated through children's on-going engagement in coppicing, den and hedge making. Knowledge of tree/human relations is not understood as a transmission of complex structures and classified as thinking or making (Ingold 2011). Like the encounters with soils and mud, knowledge of/with treescapes is open-ended, proliferating, continually on going (Horton and Kraftl, 2006), equally processing bodies, actions, and perception in every movement (Ingold 2011, 159).

Getting the measuring of trees

Back in Bolton, we are measuring trees. Year 3 (ages 7-8) children accompanied by our research team including two scientists, an artist, a philosopher, a geographer, two childhood studies researchers and class teachers were in the school playground. Each group of children was asked to find a tree and measure it using special diameter tapes to measure the trunks through the (apparently) age-old skill of taking its diameter at breast height (rather ironic given the height of the . Children also were expected to observe and note down tree diameters on worksheets. These worksheets were specifically designed by our colleagues (scientists).

Children in all groups were measuring trees with tapes, recording their observations on the worksheets and filming the activity through cameras (Lenovo Tablets). As with the proliferation of activities invoked by the soil science in our earlier case study, we noted how different modes including cameras, writing boards, paper worksheets, trees, green grassy fields, the school playground, fence surrounding the school field, tree shades, measuring taps, children's bodies and their senses were all becoming, unbecoming and re-becoming part (Jewitt 2014) of the measuring the tree activity. We use snippets of a video footage recorded by the children to describe tree to tease out the ways in which the measuring activity becoming a complex, interconnected, multiple and situated activity.

We find that there are thousands of ways to measure a tree (Authors, forthcoming).

In Table 1 (insert table) the relationship between the elements become clearer if a wider multimodal analytic gaze is placed on the trees and the children together. Drawing on the work of Flewitt et al (2009) we produced an analytic table that paid attention to the child's gaze, including patterns of bodily movement, sensory activity, the affective and the feel of interactions with trees, alongside other children's movements together with speech and language plus the tree itself. The children made a vast quality (over 300) videos during their tree-planting and tree-measuring experiences. Watching them through showed a myriad of ways in which children interacted with trees, from climbing, hugging, talking, becoming, seeing trees as actors and experiencing bark (Ambreen and Pahl, forthcoming). Our mechanism for understanding this was close multimodal analysis of the children's own videos. With the stance of learning from children's perspectives, rather than extracting data (See Spyrou 2023) this produced new theoretical insights into children's relationship with trees, leading to the concept of starting with trees.

See Table 1.

Time	Footage	Objects	Senses	Talks	Actions
00:03:00		tree bark, tree branch	Children's step making noises, grass is making noises (crunch-ing)	Wait Charlie could not video this (another child is saying)	Children are stepping on the grass and the girl keeps moving

00:03:25	Tree bark, tiny tree branch, grass in between tree and the girl, school building block in the background	Sounds of tik tik	Wait (another child is saying)	The girl is now looking towards the school playground looking far away.
00:03:50	Tree bark, tiny tree branch, grass in between tree and the girl, school building block in the background			The girl is standing but camera is moving. The gap between tree and the girl is widening and the camera is capturing the playground
00:03:75	Tree bark, blue sky, tree branch			Camera is moving, the girl is walking, and she is getting closer to the tree.
00:04:00	Tree bark, Tree branch			The girl and the tree are getting very close to one another

Conclusion: starting with trees

Not only are there thousands of ways to measure a tree, there are thousands of ways to *start with trees*. Thousands of ways of *dwelling, skilling and (be)longing*. In this article, we have sought to open out – to use two key term in our case studies, to *proliferate* and render *ongoing* and unrestricted – how starting with trees can invoke so many other material forms and processes, embodied practices, utterances, feelings and forms of learning. All of these modes of proliferation weave, stretch and even break free from lines that take us – mud, researchers, soils, children, sticks, teachers, soils, practitioners, dens – on journeys between and beyond environmental education. This resonates with work that focuses closely on children's engagement with the materialities of trees (see for example Harwood and Collier 2017).

In this paper, we have sought to open out dwelling, skilling and (be)longing as a non-exhaustive framework for research and pedagogies through which we can learn to move, feel and learn in, through and with treescapes. Equally, this framework might afford a starting point for doing so in other environments, however characterised.

Dwelling requires, in part, an attunement and responsiveness to place (Lynch and Mannion, 2021). Yet, that attunement does not necessarily require the acquisition or even awareness of *particular* histories or knowledges about a place. It may, in fact, not matter precisely where we start with trees (in the sense of being at a particular, named place). Perhaps paradoxically, some aspects of dwelling with trees require particular forms of disposition and engagement, with the material facets of a space – sticks, dens, branches, trunks – and with the technologies that we have may have to hand – rules, tapes, laser scanners, clipboards, iPads. If dwelling is fundamentally about forging some kind of (even temporary) connection with a space, through climbing, playing, squelching, stroking – then in some ways it can take place anywhere, starting with any tree (as our critique of some forms of environmental education, in the early parts of this paper, suggested).

Skilling may also proceed through particular dispositions, but operates in a way that does not foreclose multiple ways of knowing or learning about trees, beyond the more-than-representational facets of dwelling. For, skilling may also involve the admixture of 'traditional' forestry techniques such as coppicing – that may be peculiar to a region or even a specific place, and its unique ways of managing the land that may stretch back for centuries. Moreover, skilling may involve and invoke 'scientific' knowledges and techniques - measuring pH or the diameter of a tree at breast height, learning what a laser scanner does, calculating the carbon mass of a tree through an established technique. What we have sought to highlight in the case studies above, however, is how such historical and scientific knowledges - which may come to dominate environmental education, and especially learning about trees - might move in and out of focus (Kraftl, 2020), becoming woven into a proliferation of ways for learning about and experiencing trees. Other stories – children's memories, stories passed through generations, speculative accounts - may warrant equal attention and, in fact, combine with dominant historical or scientific knowledges to produce even more powerful accounts of what trees do, and our relationships with them. Perhaps the *real* skill is in enabling those knowledges to combine and proliferate, and in finding ways to account for the learning that might ensue. This would require a disciplinary, methodological and professional openness, modesty and willingness to cede some control.

(Be)longing – understood as an affective condition that arises from encounters with trees and treescapes – witnesses the ongoingness and incompleteness of starting with trees. (Be)longing folds together pasts (including skilling), presents (including dwelling) and futures (through longing, hope and desire). Those futures might stretch from the apparently simple, immediate desire to climb a tree, or to get the measure of a treescape, to plans for a future treescape yet to be planted, its care, its potential for play or promulgating greater liveliness, vibrancy and diversity (the latter understood in both social and ecological senses). (Be)longing – perhaps more so than dwelling and skilling – is something that not only moves between mainstream pedagogies of environmental education but beyond: it is febrile, slippery, intangible, ephemeral. Yet, as Bennett (2010) reminds us, the constant vibrancy and movement of the world does not mean that, as humans, we should abrogate our responsibility for it: this goes as much for attempts to address climate change and environmental degradation as it does our ways of learning about it and hoping for better futures. Hence, (be)longing should more properly only operate in combination with dwelling, skilling, and manifold other ways of conceiving, feeling, engaging, and *starting*-with trees, to which this paper has only begun to attend.

Taken together, it is our contention that *dwelling-skilling-(be)longing* offer a framework – only *a* framework, but we argue a very important one – for future research and pedagogic practice in environmental education. Our detailed case studies have been carefully-chosen to offer insights into what such research and practice might look like, although are meant as points of departure, invitations to consider and experiment, rather than as any kinds of 'exemplars'. Yet, we argue, they afford ways of starting with trees that might enable a proliferation of ways to work, play, move and feel between and beyond environmental education.

References

Bennett, J., 2010. Vibrant matter: A political ecology of things. Duke University Press.

BERA Research Commission. (2021). A manifesto for education for environmental sustainability. British Educational Research Association. https://www.bera.ac.uk/news/manifesto-for-education-forenvironmental-sustainability-efes-published-by-bera-research-commission

Blenkinsop, S., Jickling, B., Timmerman, N. & Sitka-Saga, M.D.D. (2018). *Wild Pedagogies: Touchstones for Re-Negotiating Education and the Environment in the Anthropocene*. Germany: Springer International Publishing.

Cachelin, A., Rose, J. and Paisley, K., 2015. Disrupting neoliberal discourse in critical sustainability education: A qualitative analysis of intentional language framing. *Environmental Education Research*, *21*(8), pp.1127-1142.

Common Worlds Research Collective, 2020. Learning to become with the world: Education for future survival. Paper commissioned for the UNESCO Futures of Education report.

Crinall, S and Someverville, M (2019) Informal environmental learning: the sustaining nature of daily child/water/dirt relations. ENVIRONMENTAL EDUCATION RESEARCH2020, VOL. 26, NOS. 9–10, 1313–1324

Deleuze, G. and Guattari, F. (1983) On the Line. Massachusetts: The MIT Press.

Department for Education [DfE]. (2022). Sustainability and climate change: A strategy for the education and children's services systems. Crown Publications. <u>Sustainability and climate change: a strategy for the education and children's services systems - GOV.UK (www.gov.uk)</u>

Dunlop, L., & Rushton, E. A. C. (2022). Putting climate change at the heart of education: Is England's strategy a placebo for policy? British Educational Research Journal, 48(6), 1083–1101. <u>https://doi.org/10.1002/berj.3816</u>

Flewitt, R. Hampel, R, Hauck, M and Lancaster, L (2009) What are multimodal Data and Transcription? In: Jewitt, C (Ed) the Routledge Handbook of Multimodal Analysis. Pp 40-53London: Routledge

Harwood, D and Collier D. (2017) The matter of the stick: Storying/(re)storying children's literacies in the forest *Journal of Early Childhood Literacy 2017, Vol. 17(3) 336–352*

Horton, J. and Kraftl, P., 2006. What else? Some more ways of thinking and doing 'Children's Geographies'. *Children's geographies*, 4(01), pp.69-95.

Howard-Jones, P., Sands, D., Dillon, J., & Fenton-Jones, F. (2021). The views of teachers in England on an action-oriented climate change curriculum. Environmental Education Research, 27(11), 1660-1680. https://doi.org/10.1080/13504622.2021.1937576

Ingold, T. (2011). Being Alive. Essays on Movement, Knowledge, and Description. New York: Routledge

Ingold, T. (2013). Making: Anthropology, Archaeology, Art, and Architecture. New York: Routledge

Jickling, B., Blenkinsop, S., Timmerman, N., & Sitka-Sage, M. D.D. (2018). Wild Pedagogies: Touchstones for Re-Negotiating Education and the Environment in the Anthropocene. London: Palgrave Macmillan

Kopnina, H., 2014. Revisiting education for sustainable development (ESD): Examining anthropocentric bias through the transition of environmental education to ESD. *Sustainable development*, *22*(2), pp.73-83.

Kraftl, P., 2020. *After childhood: Re-thinking environment, materiality and media in children's lives*. Routledge.

Land, N., Vintimilla, C.D., Pacini-Ketchabaw, V. and Angus, L., 2022. Propositions toward educating pedagogists: Decentering the child. *Contemporary Issues in Early Childhood*, 23(2), pp.109-121.

Lynch, J. and Mannion, G., 2021. Place-responsive Pedagogies in the Anthropocene: attuning with the more-than-human. *Environmental Education Research*, *27*(6), pp.864-878.

Mackey, G (2012) To know, to decide, to act: the young child's right to participate in action for the environment *Environmental Education Research* Vol. 18, No. 4, August 2012, 473–484

Monroe, M.C., Plate, R.R., Oxarart, A., Bowers, A. and Chaves, W.A., 2019. Identifying effective climate change education strategies: A systematic review of the research. *Environmental Education Research*, *25*(6), pp.791-812.

Nxumalo, F., Nayak, P. and Tuck, E., 2022. Education and ecological precarity: Pedagogical, curricular, and conceptual provocations. *CurriCulum inquiry*, *52*(2), pp.97-107.

Puig De La Bellacasa, M., 2015. Making time for soil: Technoscientific futurity and the pace of care. *Social studies of science*, *45*(5), pp.691-716.

Rousell, D. and Cutter-Mackenzie-Knowles, A., 2020. A systematic review of climate change education: Giving children and young people a 'voice'and a 'hand'in redressing climate change. *Children's Geographies*, *18*(2), pp.191-208.

Salazar, J.F., Granjou, C., Krzywoszynska, A., Tironi, M. and Kearnes, M., 2020. Thinking-with soils: An introduction. *Thinking with soils: Material politics and social theory*, pp.1-13.

Spyrou S. (2023) From extractivist practices and the child-as-data to an ethics of reciprocity and mutuality in empirical childhood research. *Childhood*, 31 (1). <u>https://journals.sagepub.com/doi/10.1177/09075682231220158</u>

Trott, C. D., and Weinberg, A. E. (2020) "Science Education for Sustainability: Strengthening Children's Science Engagement through Climate Change Learning and Action". *Sustainability*, 12 (16):1-24

Taylor, A. and Pacini-Ketchabaw, V., 2018. *The common worlds of children and animals: Relational ethics for entangled lives*. Routledge.

Taylor, A., Zakharova, T., & Cullen, M. (2021). Common Worlding Pedagogies: Opening Up to Learning with Worlds. *Journal of Childhood Studies*, *46*(4), 74-88. https://doi.org/10.18357/jcs464202120425