
Special issue: *Towards an eco-social pedagogy*

Research article

Trees, ears and the space between: exploring the practices of transformative pedagogies, including response-ability and reciprocity, with primary school children in Manchester

Raichael Lock^{1,2,*}  Ryan Woods^{1,*} 

¹ University of Manchester, UK

² Director, Manchester Environmental Education Network (MEEN), UK

* Correspondence: raichael.lock@manchester.ac.uk; ryan.woods@manchester.ac.uk

Submission date: 30 December 2024; Acceptance date: 31 July 2025; Publication date: 1 October 2025

How to cite

Lock, R. and Woods, R. (2025). Trees, ears and the space between: exploring the practices of transformative pedagogies, including response-ability and reciprocity, with primary school children in Manchester. *International Journal of Social Pedagogy*, 14(1): 10.
DOI: <https://doi.org/10.14324/111.444.ijsp.2025.v14.x.010>.

Peer review

This article has been peer-reviewed through the journal's standard double-blind peer-review process, where both the reviewers and authors are anonymised during review.

Copyright

2025, Raichael Lock and Ryan Woods. This is an open-access article distributed under the terms of the Creative Commons Attribution Licence (CC BY) 4.0 <https://creativecommons.org/licenses/by/4.0/>, which permits unrestricted use, distribution and reproduction in any medium, provided the original author and source are credited •
DOI: <https://doi.org/10.14324/111.444.ijsp.2025.v14.x.010>.

Open access

International Journal of Social Pedagogy is a peer-reviewed open-access journal.

Abstract

We tell the story of an interdisciplinary project involving children in caring for, planting, listening to and becoming kin to the trees in their school grounds. We explore how pedagogies of transformational learning, response-ability and reciprocity can be practised to enable and improve relations with non-human kin. In Moss Side, Manchester, 2023, eleven children from a primary school council joined an after-school club to learn about the trees in their school grounds. Working with MEEN's Treemarkable project, they were introduced to climate science and the notion of the wood wide web. They learnt

to identify the trees, map their presences, tend to them with mulching and pruning, hug them and plant more. Nested into this was a soundscape research project that involved pupils in soundscape and deep listening, putting microphones into trunks to listen to the trees, and meditating on becoming the trees. Rooted in education for sustainability we highlight how it is possible to work beside the current educational system to facilitate transformative learning methodologies. We track how practising response-able and reciprocal pedagogies in the school field helped to inspire empathic responses and reconfigure Indigenous knowledges. By breaking out of the four walls of the classroom the project helped to regenerate human connectivity with the land while the careful use of creative practices cultivated attentiveness and improved relations between the human and non-human kin of Moss Side.

Keywords social pedagogy; education for sustainability; transformative education; response-ability; reciprocity; trees; soundscape; deep listening

Introduction

As science amasses evidence of the different crises facing the planetary systems of Earth, it is becoming ever more urgent for humans to find appropriate responses to the emergency as individuals, as societies and through coming to better understandings of our co-dependencies with the world (Rockström et al., 2009). According to Salonen et al. (2023), 'The rethinking of human life in its relationship to nature has become imperative because human life is intertwined with planetary systems' (p. 616), an observation that has inspired the theory of planetary social pedagogy (PSP). However, as they point out, it is not enough to 'rethink' or theorise our relations; what is needed is a means to facilitate learning that inspires 'a social-ecological worldview', which, in turn, facilitates 'cultural transformation' (p. 620).

The pedagogical approach that Salonen et al. (2023) regard as being most helpful in resituating human–planetary relations is the transformative learning approach (Mezirow, 1996), which they describe as 'bringing together rational knowledge, a collaborative reflection of reality, and a holistic experience of reality' (p. 626). They expand this understanding by referring to Sterling's (2011) three levels of learning: cognitive learning based around knowledge content, meta-cognitive learning that engages with skills such as systems and critical thinking, and epistemic learning that relates to 'experiences that can bring forth new affective, intuitive, imaginative, and embodied knowledge' (Salonen et al., 2023, p. 627) or a new worldview.

The intent of this article is to scrutinise a project called Treemarkable through the pedagogy proposed by PSP, then to extend the analysis through applying the competencies of a response-able pedagogy, as outlined by Bozalek and Zembylas (2017), and finally to add notions of reciprocity based on Kimmerer's (2015) understanding of Indigenous knowledges. In doing so we add to the plethora of objectives formed around sustainability education, but then aim to untangle and demystify them by exploring how the different pedagogical aims are experienced through specific practices.

Therefore, one of the questions that this article poses is how educators can create opportunities for transformative learning, especially given the constraints of the education system in England where the curriculum tends towards a shallow, 'cognitive' level of learning (Salonen et al., 2023, p. 630). We recognise the need for systemic change in education, but the Manchester Environmental Education Network's (MEEN) work, as expressed through the example of the Treemarkable project, aims to enact such theoretical objectives close to the boundaries of formal education, in this instance through an after-school club, with the expressed aim of improving human–tree relations. Existing outside the curriculum, this work is an example of what PSP would term 'co-creative enquiry' (p. 635).

We begin by introducing the Treemarkable project as facilitated by MEEN and then by explaining how it unfolded through the creative work undertaken with one of the authors (RW). We go on to examine the various competencies associated with transformative learning before aligning and discussing them in relation to the research materials gathered throughout the project.

Background: Treemarkable

The first author (RL) is the director at MEEN, a small charity with the mission to integrate into education the knowledge, values and skills for a sustainable way of life. Throughout MEEN's existence school staff and young people have been planted a considerable number of trees in schools across Manchester. However, the tree survival rate is low, as many small tree whips are mown down or damaged through excessive strimming by companies bought into school to manage the grounds. Some trees die from drought in their first year, especially during the recent hot summers, while yet more find the impoverished soils of the inner city uninhabitable.

The Treemarkable project emerged from reflecting on these losses and, in response, proposed that school staff and pupils were up-skilled not only to plant trees but also to provide for their ongoing care through fostering better human–tree relations. In the first phase of the project, MEEN worked with three primary schools close to the city centre. MEEN aims to combine different levels of learning from cognitive learning – such as exploring different tree species – through including meta-cognitive notions, such as understanding human–plant co-dependencies, while also attempting to introduce epistemic learning by enabling and supporting young people to consider what actions they would like to take in response to their learning. MEEN facilitates the pupils' priorities through embedding them in the programme and then encourages the young people to become community educators on the theme. After all, if environmental education is focused on helping develop new skills for a new social-environmental worldview, its facilitation must offer opportunities to inspire epistemic learning despite knowing how challenging and serendipitous it is to instil changes in perspective and action.

In light of this, Treemarkable's first task was to familiarise pupils with the incredible variety of trees in their locality, beginning with apple, willow and holly trees, whose forms they might already recognise. Given the notion of *plant blindness*, particularly in urban eco-systems (Wandersee and Schussler, 1999), it was important to inspire, or awaken, plant awareness through emphasising their relevance (Stagg and Dillon, 2022), whether as food such as apples, cricket bats in the case of willow, or as a symbol of mid-winter in the case of holly. The sessions also affirmed simple scientific understandings around the exchange of gases between plants and humans before extending this cognitive learning into understanding the systemic links between climate change, humans and trees. As the emphasis shifted to learning about human–tree co-dependencies the pupils were also introduced to Simmard's (2021) research highlighting how trees exchange resources through fungal relations. The pupils were also prompted to consider mutual response-abilities and how humans, by caring for trees, also care for themselves and the planetary systems we all depend on. MEEN then facilitated opportunities for them to enact tree care. Many had never used tools such as saws, loppers and secateurs for pruning away dead, damaged or diseased wood, or pushed a wheelbarrow or wielded a spade, so they were taught how to use such equipment and introduced to mulches and compost as resources to feed the trees.

Another aspect of MEEN's work, in keeping with the notion that pupils can become successful community educators, supported them to facilitate peer and intergenerational learning (Percy-Smith and Burns, 2013), by running learning activities at events. For example, a group attended Andy Burnham's Green Summit where they ran a stall hosting tree activities for other attendees challenging them to identify leaves and consider the important role that trees perform in sustaining life on earth.

All the pupils involved in Treemarkable were given the opportunity to engage in creative responses to their interactions with trees. These varied in each school, with one taking up willow weaving, another using autumn leaves to make colourful mandalas, while the third had the opportunity to work with RW, a sound artist and PhD student at the University of Manchester. The reason for embedding creative activities comes from the notion that 'When included in Education for Sustainability, creativity is about envisioning and developing alternatives for sustainability, therefore situating the act of creativity in an environmental and social ethic' (Sandri, 2013, p. 768). Being creative with wood and leaves allowed young people to explore creativity sustainably, while focusing on soundscapes enabled a range of other competencies to emerge.

In the next section of this article, we explain what happened at the third school where MEEN had been working with a group of eleven pupils from September 2022. We had run tree identification games, mapped where the trees lived, planted small trees, practised tree management skills, played a game called 'Life of a tree' to help the pupils to imagine the kinds of experiences trees might face, while also being initiated into tree hugging. When the pupils were introduced to RW, in March 2023, they were a

little apprehensive as soundscape composition and deep listening (Oliveros, 2022) were not practices that they had previously encountered, but they were also very excited by his inclusion in the project.

Creativity, soundscape and deep listening

Soundscape composition is a varied practice that can be defined by its core concerns for 'environmental listening and active engagement with our soundscapes' (Westerkamp, 2002, p. 51), while deep listening is an active process that seeks to move from involuntary hearing to conscious listening and listening on local and global scales (Oliveros, 2022). Both involve body-centred exercises that open one's attention to the senses. The aim of fielding these methods was to help young people focus on human-tree relations through creative interactions with the world.

Over three months the children engaged with listening exercises inspired by R. Murray Schafer's (1992) *A Sound Education* and Pauline Oliveros' (1971) *Sonic Meditations* that involved sound-led meditations, sound walks, the drawing of sounds and sonic mimesis of heard sounds. These sessions helped the pupils become increasingly aware of their acoustic surroundings. Their young ears became adept at discerning specific noises, although a couple of pupils could not differentiate and identify sounds from the general backwash of omnipresent urban rumble. When prompted by pointing up at the sky, several children acknowledged the noise of an aircraft, but one boy thought it was the sound of the wind or the sky, and was surprised the sound was made by an aeroplane. With time the team became better at identifying sounds from different levels of the soundscape, such as from the foreground or periphery.

To encourage the children to think creatively they were asked to draw the sounds they heard. However, what they drew in most cases was very literal and largely used representational icons, while there was a palpable anxiety to find the right answer. To support their creativity RW then made a series of vocal sounds and tasked them with drawing them in 'shape and colour', which generated much more abstracted responses (see Figures 1 and 2).

Figure 1. Representational drawings of sounds



Figure 2. Abstract drawings of sounds

With the pupils attuned to the notion of soundscapes they started working with microphones and developing associated listening practices. They were given field recorders and sent 'sound fishing' to capture sonic phenomena that caught their attention. This familiarised them with the technology and different listening modes needed when using microphones. To connect these listening practices to trees, contact microphones were inserted into cracks in trunks that were able to pick up the trees' internal sounds when human hands or sticks were tapped against them. The children practised their techniques then presented a mini concert performing musical improvisations with their tree for their human peers.

The project culminated in a sonic meditation inspired by Loveless's (2016) sound installation *In the Throat of Trees*. The pupils sat beneath the trees that they had named and with whom they had formed relationships and were led in a listening meditation focusing first on their breath, then on the surrounding sounds, before being asked to imagine what it might be like to be their tree. They then wrote letters envisaging their tree's perspective to inform humans about what they wanted them to know (see Figure 3).

Recordings of these letters were merged with field recordings captured throughout the project to form a sound installation titled *A Grove of Children* (see Figure 4), the sounds of which can be heard on the MEEN (n.d.) website. The installation was exhibited three times: at an electroacoustic festival, at MEEN's 2023 annual general meeting and at a research evening at the Manchester Museum. Rather than just representing the project, we tried to use the installation as a chance to engage the audience in similar listening and imaginative practices. Audiences were encouraged to write a sentence from a tree's imagined perspective, which were then hung onto the installation. Regrettably, the children were not given the opportunity to hear and experience the final piece as the dates and times of the exhibitions proved too difficult for the pupils to visit and, although there were intentions to show it at a parents' evening, busy academic schedules and new projects meant that these opportunities passed by.

Figure 3. Children writing letters under their befriended trees



Figure 4. A Grove of Children installation.



Memorial: responding to the unexpected

On the final visit we became aware that several of the trees whom the pupils had befriended were to be cut down to make way for an emergency access path onto the field. In wondering how to facilitate this unexpected turn we decided to tell the group. The children had mixed reactions, with some being visibly distressed, especially as they would not see their trees again as summer loomed and they would be gone in the new school year. So, we agreed to hold a memorial in September.

On our return four trees had been cut down. The group met under the remaining trees where everyone was given a chance to speak in memory of the trees that had been lost. At the end everyone gathered fallen seeds and berries to give to other schools for them to plant in the Treemarkable project.

Having explained the Treemarkable project, we now briefly describe how the research was undertaken, including ethical considerations and practical matters.

The research

The multilayered structure of the project is echoed in the various layers of the research materials that were collected. The school had given the project permission to be run with the school council as an after-school club and the researcher had requested parental permission for the children to be involved. The permissions focused on recording the soundscapes, obtaining permission for photographs and keeping a record of the interactions that took place during the programme.

Therefore, the research materials include stories from the project, photographs of the pupils and their creative work, recordings of their voices as contributions to the soundscapes, and focus group materials where they reflect on their experiences.

In the next section we look at the competencies aligned with different pedagogical approaches related to transformative learning, first analysing the approaches before exploring the research materials to demonstrate how each competency emerged through the Treemarkable programme.

Transformative pedagogies: competencies of planetary social pedagogy

The idea that transformative pedagogies are highly beneficial in facilitating education for sustainability is largely established; but with so many frameworks defining how it should emerge, the question arises of how is it possible to know whether it is being achieved? It is not enough to say that we need a different kind of education (Sterling, 2011), we need to apply creative thinking to imagine education of a different kind and then have the courage to explore how this might be facilitated even if, as in the case of this project, it remains in the margins of the mainstream.

There are, of course, many alternative educational methods being practised, such as Montessori, Forest Schools and multiple environmental education projects that attend to epistemic levels of transformative learning, so there is no claim here that the project is unique. Rather, our aim is to study sets of competencies in an effort to understand whether the Treemarkable project enacted transformative learning. In the next section we focus on competencies addressed in PSP, particularly the notion of inspiring 'new affective, intuitive, imaginative, and embodied knowledge' (Salonen et al., 2023, p. 627). Where appropriate, we also comment on any perceived levels of learning and any obvious teaching methods that have contributed to facilitate the learning.

Imagination

Our discussion begins with the imagination, as this is closely interconnected with creativity (Sandri, 2013). Being able to imagine enables not only humans to create pattern-making skills, but also the facility to explore projections of life from other perspectives. Humans are inclined to call this facility *anthropomorphism*; yet even in the naming, there is the anthropocentric assumption this is a wholly human skill – which it may or may not be. However, to imagine the life of others is invaluable for enhancing human–non-human relations: as Barad (2012) writes, anthropomorphism is useful 'as an intervention for shaking loose the crusty toxic scales of anthropocentrism' (p. 27). This research has collected innumerable examples where the imagination is activated by using specific creative teaching methods.

This was particularly evident in the exercise when the pupils were asked to write a letter to the humans from the perspective of being a tree. This pivotal activity evoked new perspectives as trees were described as having families, emotions and experiences, with one pupil writing, 'Us trees hate seeing our family getting chopped down. I was crying for hours after seeing my brother Pocky get chopped down.' In another, perhaps more positive letter, one of the pupils imagined themselves as a tree thinking, 'life is great because my friends have been coming over every week to take care of me', highlighting how the affection and care given by the pupils is appreciated. We perceived such imaginative acts as inspiring empathy for non-humans, particularly for their named friends.

Affective

The notion that educators can teach others to care for and feel empathy for the environment is a difficult task to enact in our current education system where the cognitive approach is emphasised. But the question here is whether any learning approaches as facilitated through the Treemarkable project helped inspire any new feelings in relation to trees. It can be hard to discern emotional responses, particularly as it is difficult to have insight into the participants' feelings towards trees prior to the project. However, feedback highlighted that strong emotional relations had evolved. For example, the evaluator noted that all the pupils 'expressed similar emotional connections to the trees' and that they 'were shocked to hear that some school trees were destined to be taken down'. The evaluator also noted a pupil stating that, 'Trees have feelings too and are more important than people think they are', with another pupil noting that the trees 'made me feel relaxed and calm'. The pupils had come to understand the need to care for trees, with one writing in their letter, 'We would really appreciate it if you took care of us instead of chopping us down'. Perhaps one of the strongest declarations was from a Year 7 pupil who said that having understood the eco-system better, they now have 'a passion for trees'.

Intuitive learning

Intuition is about being able to understand without applying reason, but for this very reason it is difficult to ascertain the boundaries between knowledge and intuition. It is particularly difficult when it is unclear what knowledge was held prior to the project. However, the strength of emotional connection awakened in the pupils for the trees led to some fascinating conclusions about human-tree relations that, we believe, were based on intuitive leaps. For example, in the focus group a pupil stated that 'humans sometimes hide their emotions, so being with a tree can help them', a notion that was extended to, 'A tree can be a friend. It is communicating in a different way'. To be able to consider a tree as a friend could come from experience or be an act of imagination, but it is also about intuiting the possibilities of having a relationship with a more-than-human being. Similarly, another pupil reported back that air pollution was a problem, stating that 'The smoke in the air, it's not fresh for trees. It's disgusting. I want people to change'. At no point in the project did we discuss air pollution, but the notion that both trees and humans need clean air was raised in tandem. Of course, this may have been linked to knowledge gained in other ways, or the pupil might have thought about it before their observation, but there is a sense that the pupil intuited that if air pollution is not good for humans it is therefore not good for trees.

Embodied knowledge

If embodied knowledge describes understanding the world through the physical senses, there is ample evidence that the Treemarkable project facilitated such learning on different levels. The participants learnt how to recognise different trees and, according to the evaluator, were proud of their ability to identify different species through observing bark and leaves and even described themselves as 'tree researchers'. However, although they felt a sense of agency as 'researchers' the knowledge gained was largely cognitive.

The pupils also commented on learning practical skills such as tool use for tree planting and tree care for the first time and understood that they were given the opportunity to do deep listening.

Finally, the pupils fielded their embodied experiences in the letter writing where the trees were described as hearing birds tweeting in the morning and children playing. This shows how the pupils extended their embodied sonic knowledge to embrace their imagined perception of what it means to be a tree.

A response-able pedagogy

This section explores additional competencies from different epistemological perspectives that act in support of, and can expand our notions of, transformative learning. We begin by defining a response-able pedagogy, its associated competencies and how they have been enacted in the project.

Created from feminist and new materialist perspectives, including Haraway (2016) who highlights a need for 'cultivating response-ability' (p. 32) and Barad's (2010) claim that response-ability 'is not a calculation to be performed' but rather 'an iterative (re)opening up to, an enabling of responsiveness' (p. 265), the performance of a response-able pedagogy can be described as interacting with the world with ethicality. Barad (2007, 2014) defines their philosophy of agential realism as an ethico-onto-epistemology, where being, knowledge and ethics are the ongoing performance of the world.

Bozalek and Zembylas (2017) explored the notion of a response-able pedagogy writing that, 'For Barad, matter is not just of the head but also of the heart and hands; it has to do with a scholarly engagement with care, social justice and seeing oneself as part of a world' (p. 65), all themes that resonate with transformative learning. They explored the idea of facilitating a response-able pedagogy in a South African higher educational setting and outlined four key relational practices as being central to its method. The four competencies are attentiveness, curiosity, rendering capable and response-ability.

Attentiveness

Being attentive or aware of the world would appear similar to the concept of gaining embodied knowledge, but there is one clear and significant difference. Bozalek and Zembylas (2017) state that for a response-able pedagogy to be enacted, 'engagements across difference and the ways in which they happen are very important' (p. 67), highlighting 'the ability to apprehend, to listen, to be open and respectful and the ability to inhabit just practices in collective spaces' (p. 68). If embodied knowledge is about sensing the world and being able to practice skills in the world, attentiveness is about how we respond to the world, it is relational in its approach and about 'becoming-with the other' (p. 67). Much of the discussion around practising a response-able pedagogy in the Bozalek and Zembylas article focuses on bringing students from different backgrounds together, while Haraway's emphasis is on inter-species relations with Barad's view extending further to meet the universe in a relational process which is 'open and alive to each meeting ... so that we might ... breathe life into ever new possibilities for living justly' (Barad, 2007, p. x).

We posit that this project enabled young people to expand their attentiveness. Through processes of deep listening (Oliveros, 2022) and attending to the needs of our non-human kin, the participating pupils heightened their environmental awareness. For example, during a listening session a pupil learnt to discern the sound of a passing aeroplane, they learnt that dead wood and living wood create different sounds because of their internal structure and that too much mechanical sound can be unpleasant and even stop trees from sleeping comfortably: as one pupil explained, 'Trees don't feel comfortable with a lot of noise'.

However, attentiveness also requires that 'just practices' (Bozalek and Zembylas, 2017) are performed or, as Barad (2007) writes, that we find 'new possibilities for living justly' (p. x) and the pupils were keen to ensure that trees were given respect: as one pupil wrote from the perspective of their tree, 'I want you to know that I have feelings too and I want to be treated like a human'. The creative element of this project made space for playful and affective attentiveness, encouraging an awareness of the trees beyond their taxonomical and visual presence.

Curiosity

When exploring the importance of curiosity Bozalek and Zembylas draw on Haraway's comments about Despret suggesting that curiosity is more than an act of imagination: rather, it is an ontological and epistemological visiting. It is more than being curious and asking questions, such as whether trees feel or think, or get bored, for example, it is about 'the possibility to be surprised and intrigued through unanticipated encounters' (Bozalek and Zembylas, 2017, p. 68).

We have recorded several examples where the pupils have visited trees and intra-acted (Barad, 2003, 2007) with them in surprising ways. One example comes from a pupil writing from the perspective of Huggy the tree, stating 'I can hear my leaves rustling in such a rhythm that I sometimes get hypnotised', suggesting that the pupil's curiosity deepened into a visitation, even into an immersion of treeness.

Response-ability

If attentiveness is about being able to perform 'just practices', then response-ability is about being able to perform in the midst of asymmetrical and multidirectional power differentials: it is about being accountable in our relations with the world.

The pupils participating in the Treemarkable project understood the notion of being response-able, particularly through being able to actively care for the trees. The evaluation noted that once the pupils had planted saplings they visited them 'every week to check they were watered – "Twice a day at the beginning when it's dry"'. They also understood the trees' longevity and wanted their trees to be there 'In a hundred years,' noting that 'It might have been the first time that tree had been hugged in a hundred years and never been cared for.'

The cutting-down of four of the trees was a difficult issue for some of the pupils: these were trees that they had taken time to identify and befriend. Although they questioned the decision made by the senior leadership team, the idea that they might speak to the head teacher to defend the trees did not emerge. The power differential between the pupils and the decision-makers in the school was too large to be overcome. Yet many of the pupils found alternative routes for performing acts of response-ability that highlights how they were rendered capable by the project.

Rendering capable

Rendering capable is a process that weaves together 'ethical (how to flourish in a complex world of living and dying), ontological (being and becoming, making-with) and epistemological (knowing-with, enlarging each other's thinking) response-abilities' (Bozalek and Zembylas, 2017, p. 69). In this instance, it was about enabling young participants to respond to the world in relation to issues that mattered to them. By supporting the pupils to become community educators their confidence grew and as one pupil reported, 'I used to be shy and wouldn't reach out to people, now I reach out to people.' As the evaluation highlighted, the pupils were proud of increasing their skills in knowledge sharing. But this increase in confidence, although it did not render them capable to respond to the trees being cut down in school, rendered them capable in situations beyond the school gates. The evaluator described one group discussing 'how they were able to talk to their families about what they were learning', with one pupil sharing that 'My Grandma knows about flowers, I can talk to her about the trees. I know about difference and I know about the purpose of trees.' Meanwhile, another pupil reported, 'I spread awareness. I told my Mum and Dad and we planted some plants in our yard', while a girl had persuaded her mother 'to grow a small tree in a pot at home', explaining that her 'parents could now see that trees were "beneficial to our community"'. Anecdotally another pupil reported they had prevented a tree from being cut down in their garden, highlighting how the project had rendered them capable to defend the lives of non-human others.

Towards reciprocity

While the science and philosophy of new materialism have revealed additional pedagogical ideas that can assist in addressing the planetary crises, we also acknowledge that it is the current dominant traditions of western thinking that are responsible for creating them and they are equally responsible for desertifying our English formal education system. We therefore feel a need to acknowledge the parallels between new materialism and Indigenous wisdoms having been particularly inspired by Robin Wall Kimmerer's (2015) teachings in *Braiding Sweetgrass*. Kimmerer too posits the need to recognise responsibilities and that these should be championed over rights. To have custody over land is to come into a set of responsibilities with it (Kimmerer, 2015, p. 28).

Kimmerer (2015) points to Indigenous peoples' views that relationships between humans and non-human kin are experienced as being reciprocal, whereby:

Each person, human or no, is bound to every other in a reciprocal relationship. Just as all beings have a duty to me, I have a duty to them. If an animal gives its life to feed me, I am in turn bound to support its life. If I receive a stream's gift of pure water, then I am responsible for returning a gift in kind. An integral part of a human's education is to know those duties and how to perform them. (p. 115)

We acknowledge that the notions of response-ability and of reciprocity, despite coming from different traditions, have similar understandings of the world and although we take note that new materialism is not mainstream science, it nonetheless appears that we are coming full circle through the scientific endeavour back towards Indigenous ways of knowing the world.

As Kimmerer (2015) notes, the scientific worldview has separated 'knowledge from responsibility' (p. 346) and the facilitation of the Treemarkable project was attempting to bring them together again through modelling reciprocity. The pupils gave their time to the PhD research and in return the project gave the pupils cognitive knowledge of local trees, practical skills for tree care, ample opportunity to develop deeper listening skills and built confidence for communicating with others.

The pupils also came into a multilayered understanding of reciprocity. First, on a cognitive level one of the letters acknowledged that 'we [trees] provide oranges, apples, cherries and other fruits too', indicating how trees service the world. At a meta-cognitive level, they understood the different systems at work between trees and humans and between trees, fungi and soils. As one pupil wrote in a letter, 'life is great because my friends have been coming over every week to take care of me. That makes me feel good so I pay them back by giving them oxygen and taking in their carbon dioxide'. But the pupils also addressed affective response-abilities, with one pupil noting, 'We are relieving their stress' through watering and feeding the trees, while 'the tree relieved my stress'. Meanwhile, at an epistemic level the pupils not only understood human/tree interdependencies, but most importantly they were also able to perform acts of reciprocity by caring for trees beyond the scope of the project.

An Indigenous perspective might look at current crises (planetary and pedagogical) as arising from a settler mentality. Kimmerer (2015) references her elders as saying, 'The problem with these new people is that they don't have both feet on the shore. One is still on the boat. They don't seem to know whether they're staying or not' (p. 207). She too points to the limitations of a people who do not have deep ties to place and the beings that inhabit it. Although she acknowledges the importance of preserving Indigeneity as a birthright, she also asks regenerative questions such as, 'If people do not feel "indigenous," can they nevertheless enter into the deep reciprocity that renews the world? Is this something that can be learned? Where are the teachers?' (p. 213).

Many people living in urban settings are already struggling to find a connection with the land after centuries of resettlement through enclosures and increased urbanisation. Working in the city of Manchester with a group of young people from diverse heritages, the use of the term *settlers* is not appropriate, but there may be parallel experiences between Kimmerer's settlers and the children we worked with in Moss Side who were equally disconnected from the land. This leaves us asking our own questions about how people learn about the Indigenous beings of Manchester? How can they grow their roots into Mancunian soils? How can they come into a deep reciprocal relationship with the land?

Kimmerer (2015) shares the story of a humble teacher called white-man's-footstep (that is, the native American name for plantain or plantago major). In contrast to many settler species like kudzu that colonise Indigenous plants' habitats, plantain did things differently:

[Plantain's] strategy was to be useful, to fit into small places, to coexist with others around the dooryard, to heal wounds ... Maybe the task assigned to Second Man is to unlearn the model of kudzu and follow the teachings of White Man's Footstep, to strive to become naturalized to place, to throw off the mind-set of the immigrant. (p. 214)

Unlike in North America, plantain is Indigenous to the UK, although we may have been stripped of the ability to see it, know it and learn from it. But perhaps the task for transformative educators is to learn how to listen to it again, to explore the shapes and languages of Indigenous beings so that we can all remember how to live response-ably through understanding our reciprocal relations in the places we live. Through Treemarkable, and other similar projects, we want to become the plantain growing up through the cracks in the school playground from which children might come to better understand the world.

Reflections

In this article we set out to explore the range of competencies associated with PSP and then added further competencies to the discussion to extend notions of transformative education into the realms of new materialist thinking and Indigenous wisdoms. We believe these additional competencies have deepened our understanding of education for sustainability.

At the beginning of this article we raised two questions, the first being, how is it possible to know whether transformative education is being achieved? Through gathering stories and discussing the Treemarkable project with the pupil participants we have found connections and resonances between various pedagogical terms applied in the field of transformative education and the pupils' experiences of the project. But does this mean the project facilitated transformative education? The evidence would seem to indicate so, yet without the school absorbing and practising education for sustainability across the whole school community this small project has little reach. It may inspire 'a social-ecological worldview' (Salonen et al., 2023, p. 620) for the pupils who were involved in the project, but it will not facilitate the 'cultural transformation' that Salonen et al. are calling for.

However marginalised such educational opportunities might be, given the constraints of the education system in England, we have shown how sustainability educators can create opportunities for exploring transformative learning pedagogies by appearing in and working in the cracks between formal and informal educational settings.

Funding

The research for the project was supported by the University of Manchester's School of Arts Languages and Cultures bursary studentship.

Acknowledgements

We would like to thank the pupils and staff of the primary school for their time and involvement, MEEN's members and trustees for supporting the work of the charity, and Novars Research Centre, University of Manchester for the loan of microphones and recording materials.

Declarations and conflicts of interest

Research ethics statement

The authors declare that research ethics approval for this article was provided by the University of Manchester's School of Arts Languages and Cultures ethics board.

Consent for publication statement

The authors declare that research participants' informed consent to the publication of findings – including photos, videos and any personal or identifiable information – was secured prior to publication.

Conflicts of interest statement

The authors declare no conflict of interest with this work. All efforts to sufficiently anonymise the authors during peer review of this article have been made. The authors declare no further conflicts with this article.

References

- Barad, K. (2003). Posthumanist performativity: Towards an understanding of how matter comes to matter. *Signs*, 8(3), 801–31. [CrossRef]
- Barad, K. (2007). *Meeting the universe halfway: Quantum physics and the entanglement of matter and meaning*. Duke University Press.
- Barad, K. (2010). Quantum Entanglements and Hauntological Relations of Inheritance: Dis/continuities, SpaceTime Enfoldings, and Justice-to-Come. *Derrida Today*, 3(2), 240–68. [CrossRef]
- Barad, K. (2012). Nature's queer performativity. *Kvinder, Køn & Forskning*, 1(2), 25–53. [CrossRef]
- Barad, K. (2014). Diffracting diffraction: Cutting together-apart. *Parallax*, 20(3), 168–87. [CrossRef]

- Bozalek, V., & Zembylas, M. (2017). Towards a respons-able pedagogy across higher education institutions in post-apartheid South Africa: An ethico-political analysis. *Education as Change*, 21(2), 62–85. [CrossRef] [PubMed]
- Haraway, D. (2016). *Staying with the trouble: Making kin in the Chthulucene*. Duke University Press.
- Kimmerer, R. W. (2015). *Braiding sweetgrass*. Milkweed Editions.
- Loveless, S. (2016). *In the throat of trees* [Sound Installation]. Accessed 13 August 2025. <https://stephanieloveless.com/artwork/in-the-throats-of-trees>.
- Manchester Environmental Education Network. (n.d.). *Treemarkable soundscapes* [Videos]. Accessed 13 August 2025. <https://www.meen.org.uk/videos/2>.
- Mezirow, J. (1996). Contemporary paradigms of learning. *Adult Education Quarterly*, 46(3), 158–72. [CrossRef]
- Oliveros, P. (1971). *Sonic meditations*. Smith Publications.
- Oliveros, P. (2022). *Quantum listening*. Ignota Books.
- Percy-Smith, B., & Burns, D. (2013). Exploring the role of children and young people as agents of change in sustainable community development. *Local Environment*, 18(3), 323–39. [CrossRef]
- Rockström, J., Steffen, W., Noone, K., Persson, Å., Chapin, F. S., Lambin, E., Lenton, T. M., Scheffer, M., Folke, C., Schellnhuber, H. J., Nykvist, B., de Wit, C. A., Hughes, T., van der Leeuw, S., Rodhe, H., Sörlin, S., Snyder, P. K., Costanza, R., Svedin, U., ... Foley, J. (2009). Planetary boundaries: Exploring the safe operating space for humanity. *Ecology and Society*, 14(2), 32. [CrossRef]
- Salonen, A. O., Laininen, E., Hämäläinen, J., & Sterling, S. (2023). A theory of planetary social pedagogy. *Educational Theory*, 73(4), 615–37. [CrossRef]
- Sandri, O. (2013). Exploring the role and value of creativity in education for sustainability. *Environmental Education Research*, 19(6), 765–78. [CrossRef]
- Schafer, R. M. (1992). *A sound education: 100 exercises in listening and sound-making*. Arcana.
- Simard, S. (2021). *Finding the mother tree*. Allen Lane.
- Stagg, B. C., & Dillon, J. (2022). Plant awareness is linked to plant relevance: A review of educational and ethnobiological literature (1998–2020). *Plants, People, Planet*, 4(6), 579–92. [CrossRef]
- Sterling, S. (2011). Transformative learning and sustainability: Sketching the conceptual ground. *Learning and Teaching in Higher Education*, 5, 17–33.
- Wandersee, J. H., & Schussler, E. (1999). Preventing plant blindness. *The American Biology Teacher*, 61(2), 82–6. [CrossRef]
- Westerkamp, H. (2002). Linking soundscape composition and acoustic ecologie. *Organised Sound: An International Journal of Music Technology*, 7(1), 51–6. [CrossRef]