

Chapter 11

Creating meaningful opportunities for children to engage with environmental education to promote sustainable changes in behaviour

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Peter attended an 'eco' primary school – a school that had achieved recognition by fulfilling certain pro-environmental criteria as determined by the Eco-Schools framework¹. Peter was proud of its eco status. He became secretary on the eco committee, and he watched with glee as the wind turbine was erected in the school playing field. This was a major achievement for the primary school, and the item was featured in the local newspaper. One day Peter heard of another school erecting their own wind turbine. Rather than celebrating the environmental success for the local community, Peter looked downcast and said, "That's not fair! That was OUR idea."

Peter's response raises many questions about values, attitudes and human nature. We might feel heartened that Peter had taken ownership of the innovation, and that he felt protective of his school's reputation. But in this context, Peter's competitive edge is not as useful as it might be in other arenas; indeed, it is positively unhelpful. Peter's response is clearly a recognizable self-centered, child-like emotion, but how can we help children learn more other-centered, pro-active and collaborative values around environmental projects and community work, in general?

Any curricular initiative about the environment should have a sustained impact on behaviour. For example, when we teach arithmetic in the classroom, we expect children to be able to work out whether the school bus will get them home in time to watch their favourite TV show, or how much change to expect when they buy sweets in a shop. If education is situated solely in the classroom lesson, such that a child can successfully spell a list of words for a spelling test but cannot write a letter to their pen-friend, then our efforts to fully prepare our children to live in community have fallen short. It is important for literacy and numeracy to be seen by children as relevant and applicable to everyday life. I suggest the same applies to both social and ecological sustainability.

¹ <http://www.eco-schools.org.uk/>

In this chapter, I examine the relative merits of three different approaches to sustainability education in a way that aims to influence *a sustained impact on social behaviour*:

1. Adopting a school ethos of sustainability, for example through becoming an Eco school – an international programme that awards schools ‘eco status’ if they fulfill certain conditions relating to sustainability.
2. One-off activities or visits from local authority or activist groups.
3. Engaging children as ‘researchers’ on a project relating to climate change.

I conclude by considering the notion of courage and the challenge of teaching about serious environmental issues in the context of institutional cultures (e.g., public education) that are politically conservative and averse to controversy.

Deep Dynamic Versus Surface Learning

When teaching everything, not just concepts about the environment, our aim must be to develop deep rather than surface knowledge (Marton and Saljo, 1976). Rather than expecting children to memorize facts only to regurgitate them undigested on a test, we want the children to think deeply about new ideas and initiate related actions. Lublin (2003) summarizes characteristics of students who are engaged in deep learning: able to relate new ideas to previous knowledge; able to relate concepts to everyday experience; and able to interact vigorously with the content (p. 3). The emphasis is on making connections among prior knowledge, new knowledge and future applications. So how do we promote deep learning about the environment? What is the best means of ensuring that what children learn in school is also useful and applicable in the context of life outside of the classroom? The notion of ‘active’ or ‘dynamic’ learning is helpful in this context: whereby the child is fully engaged in ‘learning by doing’, and actively constructing their own understanding by being ‘forced to think’ (Petty 2009). A statement from ten-year-old Ellie, collected while I was researching children’s knowledge about climate change (Satchwell, 2013), summarizes the phenomenon of static learning – as opposed to dynamic learning - in relation to the carbon cycle:

“We just store it in our brains, and keep it there. We know it, but it just stays in there. We don’t do anything about it. We forget about it until our next science lesson.”

Ellie's view demonstrates the problem of children not being fully engaged with formal education. Ellie's learning is stuck inside the classroom, and it has characteristics we would associate with surface rather than deep learning.

Geoff Petty and others maintain that knowledge gained through active means is much better recalled, understood, and enjoyed (Petty, 2015). Further, many educators understand that knowledge cannot be transferred simply from one person to another in a straightforward way, like how we might think about a teacher 'delivering' lessons to children. Teachers who hold constructivist beliefs about learning are apt to set up learning experiences that give students 'space' to 'construct knowledge' for themselves and make sense of concepts and problems in their own way, which often also means allowing them to come to understandings in their own time.

School Ethos of Sustainability

The Eco-school Programme provides a 'checklist'² to consult when applying for a *Green Flag*, the designation for a school deemed exemplary in its sustainability practices. While this is a useful indication of what is required, there is a paradox in the implication that 'ticking boxes' against environmental initiatives is a satisfactory approach. It may be possible to positively answer the question: 'Does your school have an Eco-Committee that meets at least once every half term?' or even 'Has sustainability been covered in at least three curriculum areas by most year groups?' But it is more difficult to claim with confidence that the children and staff hold values or display behaviours that are congruent with these responses. Rather, it is the school *ethos* that is reflected in these initiatives which is the real indicator of the school's credentials. The 'Note on Litter' at the bottom of the webpage is perhaps more telling in this respect: "During a Green Flag assessment, the assessors will be on the lookout for litter – and they will not recommend the school for its award if there is a litter problem."

The school attended by Peter had successfully received its Green Flag and has subsequently been awarded a prestigious International Eco-Schools Certificate for its 'continued excellence in

² <http://www.eco-schools.org.uk/applyforanaward/greenflag/greenflagchecklist>

improving the environmental performance of the school and the wider community'. This was partly a result of installing the wind turbine and fulfilling requirements of eco-committees, recycling, and so on. But this school has taken a further step by embedding environmental education within the curriculum. The school's website describes the school's commitment to a holistic approach to the environment and combines this with invoking a belief in a dynamic learning approach: it aims to provide 'a quality, investigative education, enriched by experiences gained from using the environment whenever appropriate'.

The whole-school approach is also suggested in its belief in a link between attitudes and behaviour: From the school's website: *The teachers and support staff raise awareness of environmental issues, not just through delivery of the curriculum, but also through demonstrating good practice in their management of the classroom and the surroundings of the school. From this lead, the children are encouraged to act in an environmentally responsible way.* This expression of the interrelationship between the curriculum, the school ethos, and prosocial behaviour of staff and pupils implies a commitment to including the environment in everyday education. I suggest it also means that deep learning is more accessible, as the children are encouraged to make connections between what they learn in lessons and their experiences in the wider environment and the community.

Within the English school system, in which the National Curriculum has become increasingly prescriptive, such an approach is indicative of the school's confidence in itself. As an 'outstanding' school according to government inspectors, it has been able to, for example, incorporate literacy and numeracy within its curriculum through topic work, rather than devoting the statutory hour to each. In the same way, the school is in the position of being able to have the courage of its convictions and incorporate environmental issues and values reflected in its teaching and curriculum. A school deemed as 'failing' would be under scrutiny to ensure improvement in results and would be more likely to resort to additional numeracy and literacy classes and increased testing. So while the eco school's investigative approach to the curriculum is one that is most likely to lead to deep learning, it is a luxury that not all schools feel they can afford. I will return to the notion of courage later in the chapter.

Clearly this school's efforts are laudable, and the school well deserves its eco status. However, even in this school where sustainability is embedded, Peter's comment indicates some lack of holistic understanding. Being able to erect your own wind turbine seems to be a highly dynamic as opposed to static example of learning – the children were involved in deciding how, where and when the turbine would be installed, and engaged with the whole process at a deeper level by learning how it worked, watching its construction, and thereby contributing to their understanding of physics and geography as well as environmental issues. So what does Peter's protestation suggest is going wrong? Perhaps what is missing here is the understanding and transference of values relating to the project, not just within school, but beyond. When it comes to activities designed to improve our interaction with the environment, we need to subscribe to a set of values that places the interests of the planet above the interests of our own individual immediate gratification. If we don't work together – not only in our schools, but in our wider communities - we will make little difference.

Nonetheless, the Eco-Schools framework is one way of ensuring that this journey is at least begun, and from this initiative teachers and children can begin to make connections between school, community and beyond.

One-off Environmental Activities

In a recent study (Satchwell, 2013), when I asked children in primary schools for memorable events relating to environmental education, they were quick to tell me about the day the council brought its recycling wagon to the playground. The main attraction for some of the children seemed to be that they were allowed to sit next to the driver, while another child gave me a list of statistics he had apparently memorized about how many tin cans or bags of textiles one would need to collect to earn £10. There is clearly novelty value in introducing someone from outside the school to talk about a topic; but there is also a value here in relating the children's learning in school to life in the community. Children were encouraged to take home the message that recycling at home was a good thing to do; and that these people driving the wagon would be the same people coming to their street to empty the recycling boxes. This is a neat demonstration of overlap between school, home and community.

In our society, children are often construed as ‘agents of change’ in the context of the environment. They are seen as ‘custodians of the earth’ and ‘ambassadors for the future’. But in reality, their agency and power is severely limited: they have little influence in relation to money, politics, or social systems. Even within their own schools, they have little say in how the school is run, how or what they learn, or even what they wear. While research has shown that children’s ‘pester power’ is influential in terms of getting their parents to buy them expensive presents or unhealthy snack foods, children’s insistence on recycling or walking instead of driving is less likely to be heeded. Nonetheless, they should not be dissuaded from trying, and one-off events can carry additional impact simply by being out of the ordinary.

Another example of the one-off activity occurred, again, during my study of children’s understanding of climate change, but this time I was the initiator of the activity. I had collected a variety of websites and games relating to environmental issues, and I worked with teachers to engage students in exploration and play. After one such day of activities using these climate-change related resources with a group of primary school children, I wrote individual letters to each of the children, asking what they could remember about the day. Inevitably perhaps, given the norms and expectations of children’s behaviour when receiving visitors in school, I received a thorough reply from each child outlining the ways in which I had helped them to understand more about climate change. They told me how much they had learnt, and how, for example, they were now recycling, walking to school, and turning off lights at home. As delightful as it was to receive such positive responses, it is difficult to believe that I had really been the purveyor of such knowledge, or that the changes in their behaviour would be sustainable. One child wrote the following:

‘Ever since I’ve been talking to you, I have been walking home from school a lot more than often and thanks to you I have been really thinking about and have started to recycle even’.

Of course, influencing students’ change in behaviour is not a straightforward and linear process. Without family support, it is unlikely that travel arrangements can be changed, nor household practices instigated that were not previously in place. For children to be effective in influencing

the behaviour of others, there need also to be changes in households, communities, governments, and certainly global agreements. All the same, one-off activities are to be encouraged, particularly if children learn of the connections between the activities and their relationship to broader concepts at the local and global levels.

Involving Children in a Research Project

Engaging children in sustained long-term research is an example of dynamic learning and a good way of enhancing children's motivation. Here, I describe an example of a project that involved children in documenting their observations of the environment, part of my own research that examined children's understanding of climate change.

The project involved supplying 12 mobile camera-phones to children aged 10, 11, and 12, and creating a closed Twitter account for them to share their observations with their peers and me. The children were identified as co-researchers, and their role was to send a tweet or take a photograph whenever they encountered something that made them think about environmental issues. I was interested in how they would interpret this instruction, and how they would communicate with one another – and with me – about the topic. My research goal was to understand children's thinking about the environment in their out-of-school lives. As it happened, none of the children had their own mobile phones, so there was an added sense of novelty, especially their new identity as 'ecotalkers'. (For more on advantages of learning with mobile technologies, see Galloway et al (2014).)

The children were given the mobile phones to take home during the Spring half term. The weather at this time was unusually hot, and was reflected in comments like the following³:

I put an ice cube outside and it melted in 2 minutes

Most of the flowers in my garden have lost there leaves but i dunno if thats with heat or my dads a rubbish gardener

³ Original spelling and punctuation in children's tweets are retained.

Another topic was travelling on roads for the holiday week:

Hi people a lot of cars that people buy are second hand and most of the time those cars burn fuel less efficiently

Read about tourism officials being mad as they lost millions cos the weather report said it would rain but it was hottest day of the year

The children took full advantage of their phones' inbuilt cameras and took photographs of a visit to the local tip, the countryside on a bicycle ride with their family, food compost, a wind turbine, recycling boxes, a rainstorm, and various other objects whose meaning was more ambiguous. For example, a blurred photograph of a patch of grass turned out to be a Frisbee, which had melted in the heat. These photographs were useful as discussion points for the group after the Twitter experiment had ended. The children had kept the photos on their cameras but had not Tweeted them - this technology being a little beyond them at the time, so we met to share and discuss these artefacts.

The topics of discussion, instigated by the children's own tweets and photos, include some of the following: the weather, the natural world, traffic, and energy sources (see Table 1). The fact that all of these topics arose spontaneously from the children indicated that they were piecing together their understanding of climate change: its causes (e.g. traffic), its effects (e.g. on weather, insects, earthquakes), and human adaptations (e.g. solar panels/energy sources). These relationships were specifically articulated when a boy who had taken photographs of a range of different artefacts and scenes was asked to explain them to a group of his peers and me. He explained that the photograph of a collection of plastic bags showed his understanding that plastic is undesirable for the environment; his photograph of a radio showed where he had heard the weather forecast, indicating the importance of communication in environmental issues; a picture of a rainswept scene taken from his house window showed a rainstorm that he thought could be a result of climate change; and a photograph of a joke relating to lawnmowers in the Arctic showed his understanding that the problem is global and not just local. By explaining each photograph and discussing its meaning with peers, children created narratives about the

environment which helped them deepen their understanding of the all-encompassing nature of the topic.

Table 1: Examples of children's tweets

I was on the motoway and I saw a soala powered lamppost

When we got back if you looked over the city all u could see was pollution

Cows prouduce a lot methane !

This morn barak Obama said that soler and wind are the way forward

The pope has a lot of solar panals in his cord yard!

Verey unusal whether here it is verey rainy

It dried up really quickly today after the rain today

Why does the weather keep doing this! Its really hot and them suddenly theres a really heavy
downpour and even a storm!

Hi saved water from paddling pool we watered our plants with it. It's another hot day

We went to the park on Sunday I think the water is reused for the splash park it goes into a
tank underground

Heat can affect the environment but the sun is usefel as it gives us resources like light

Hi its sunny today. I wonder if that affects the ice burls in antarutica

Hi just been on net , read about an earthquake in Caribbean it was 7.1 magnitude it killed at

least 1 person

By taking the mobile phones out of school – and even taking them away on holiday in some cases – the children integrated real experiences in their daily lives with school learning. They extended ‘class time’ into their own time. There was evidence of parental input in some of the tweets (detectable in some cases by a sudden standardization of spelling), and we could claim that the mobile phone acted as a bridge between home and school. In addition, the children worked collaboratively. After a school outing when they walked up a big hillside close to their school, their messages included the following Tweets (in a group of five children):

Ecotalker 4: We saw lots of insects and things like that up [the local hill] that you don't usually see in your garden

Ecotalker 5: Ye like the big green catipila

Ecotalker 4: I've seen more wasps about and fewer butterflies and also there are less flies and other insects coming into our house

Ecotalker1: We seem to have a lot of clover in the garden this year and the bees are on it all the time

Ecotalker 2: The weather is not settled, temps very mixed up. We should be having more sunny days with the odd day of rain

This Twitter exchange began from their observations on a school walk, observations that I suggest were heightened by their involvement in this mobile phone project. Children built on the previous comments of peers, indicating that they were thinking of ways in which the environment connected with nature and with the weather. As in the example relating to their photographs, the children's conversations became important ‘sites’ of learning. Facilitation by teachers at this stage can lead to children making connections between changing habitats and climate change. We can describe this as dynamic learning, reflecting a deep approach to constructing knowledge.

If this study were to be repeated or extended, I hope that the discussions provoked by children's tweets and photographs relating to their environment would develop into an action plan on some aspect of the local ecology that they deem problematic. This would comprise the final step from making meaning, creating collaborative understanding, and working together to do something about a problem they identify and define for and by themselves.

Courage in the Curriculum

In the UK currently, there is no requirement for children in primary school to consider causes and effects of climate change or, more generally, environmental education on sustainability. While the curriculum for 11-14 year-olds includes aspects of climate change in science and geography, it is still not mandatory for children under 11 years. Instead, there is an ever-increasing emphasis on literacy and numeracy, with increasing numbers of assessments and tests so that records can be kept to prove it. (See children's poet Michael Rosen's (2015) 'Guide to Education' for an eloquent description.) The results of the 2012 Programme for International Student Assessment (PISA) tests showed the UK as 26th in maths out of 65 countries, and 23rd in reading, indicating no improvement since the last tests in 2009. The response has meant that in the UK, currently, there is even more pressure on schools to "raise standards." This, in turn, has led to more rigorous testing and focus on a narrower curriculum. I suggest that these two points combine to *reduce* environmental education in schools.

For a start, the over-emphasis on the 3Rs in schools results in less time for extra-curricular activities, which is where environmental education typically is situated. Second, one could argue that the ethos of constant assessment and testing in schools encourages a competitive attitude to education. The incessant testing of children inevitably involves some element of pitting them against one another; and the results of the tests lead to league tables which compare schools with one another, thereby inculcating an ethos of competition between schools. Such competitiveness is potentially detrimental in the cause of saving the planet. Klein (2014) declares:

“For any of this to change, a worldview will need to rise to the fore that sees nature, other nations, and our own neighbours not as adversaries, but rather as partners in a grand project of mutual reinvention” (p. 23).

The primary curriculum as it stands means that it is up to individual teachers – and only if they have the support of their headteachers - to make space in a crowded curriculum to provide children with the opportunity to understand the interaction of the natural world and human activity. Clearly, for teachers to help children *act* on this knowledge takes some courage.

A memorable event recalled by some children was an environmental group that visited primary schools to engage children in activities to help them understand the carbon cycle, to recognize ways in which they and their families used energy and to think about ways of adapting to climate change. Taking a full day of curriculum time out to accommodate this visit was a brave decision for the school in a time when government targets have to be met. It also resulted in an experience that, perhaps, made a lasting impression on the children. The event was an example of dynamic learning, involving children in carefully constructed activities, which led to them making their own discoveries about energy and how it is used. At the end of this day, they were encouraged to go home and make a difference to the ways their families used energy. I have pointed out the complexities of such an assumption – transference from one context to another is not straightforward. However, crossing boundaries between school, home and community is crucial if our actions in school are to have any long-lasting effect.

Therefore, it is crucial that schools take this leap of faith to devote school time to environmental education, which might include inviting out of school experts to collaborate, as above, or by making fundamental changes to the curriculum. But, as noted earlier, it is only the schools with the highest test scores that are likely to feel the confidence required to make changes.

Additionally, Smith (2007) points out, “By and large, people who enter the field of education are those who are comfortable in schools *as they are* rather than people who wish to become agents of institutional or community change” (p. 204). Smith insists that the issue of courage is a critical and sadly often lacking element that is required for schools to embrace environmental

education. Through having the courage of their convictions teachers can themselves become agents of change.

Teachers of young children are in a position to help their learners understand the benefits of collaboration, sharing, empathy and compassion. The most effective way to learn, as many experts on education will testify, is by doing – not by being told about something or tested on something, but by doing it. If we can encourage a seismic shift in the way our children treat the earth, the way they treat one another, and the way they would wish to be treated themselves, then indeed we can help children themselves become agents of change.

“Because in the hot and stormy future we have already made inevitable through our past emissions, an unshakable belief in the equal rights of all people and a capacity for deep compassion will be the only things standing between civilization and barbarism” (Klein, 2014, p. 462).

I suggest that for it to be reasonable to think of children as ‘agents of change’, *teachers* must first find the courage to make changes themselves. By engaging as activists in their communities and schools, teachers can show children, by example, what it means to be agents of change. And from their interaction with meaningful and holistic curricula, children learn habits and cultural practices characterized by empathy, compassion, and collaboration.

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