Targeting Environmental Education at Outcomes for Nature Conservation

by Dr Athene Reiss

Practitioners know from experience that environmental education makes a huge impression on children, who often depart sessions visibly enthused and informed about the natural world. We know less well which of our hoped for outcomes they take with them. The environmental education team at the Berkshire, Buckinghamshire & Oxfordshire Wildlife Trust (BBOWT) set out to measure some of those impacts and to consider how a better understanding of them could contribute to the development of more effective teaching. As a team, we set out to gather quantitative evidence to clarify the extent to which our teaching gives children the tools they need to grow into adults who care about and for the natural world.

The team learned more than we bargained for when we discovered that children just one year apart in age are receptive to very different aspects of that ambition. We found that Year 1 and Year 2 children learnt different things from the same sessions, a finding that we can use to ensure that we teach children what they are ready to learn and maximise the value of the precious, but limited, time they spend in an environmental education setting.

Good for children

The benefits of outdoor learning are becoming widely recognized. Gardening, outdoor lessons, Forest School, adventure experiences and environmental education facilitate social and educational gains for children. Research has shown positive impacts on children's self-esteem, health, relationships, behaviour and learning[1]. Improvements in wellbeing and educational standards are important benefits for children, for schools and for society more widely. And that is reason enough to find ways to deliver it, improve it and even to study it[2].

These positive outcomes are not only a 'good thing' for children, they are also useful to the environmental sector because they form some part of the motivation for schools to take children on visits to our centres, and because they validate and justify the funding of such centres from a wide social perspective. However, from the perspective of the environmental sector and particularly a Wildlife Trust, self-esteem, good behavior and the national curriculum are ancillary benefits rather than key aims in and of themselves.

The environment sector perspective

Desirable as these benefits are, if sector resources are scarce, and of course they are, then it is crucial that we ensure that environmental education contributes not only to children's well-being and achievement, but also, and primarily, to children's feeling for and understanding of the natural world. Environmentally oriented outcomes, which themselves benefit both children and wildlife, have been demonstrated to some extent. Retrospective research has shown

that exposure to environmental activities in childhood has an impact on adults' environmental consciousness and appreciation of nature[3], and various studies, particularly around the impact of Forest School, have identified general benefits for children's knowledge and understanding of the environment[4].

But there is room for much more work on the specifically environmental benefits of environmental education. Just as environmental conservation work has become more effective by becoming increasingly evidence-based, so environmental education can likewise improve by developing a similarly strong understanding of what environmental aims are achievable through good practice and what it takes to achieve them.

What should our objectives be?

It might seem that the broad objectives of environmental education would be self evident. In some ways, they are, but by defining and investigating them we gain clarity which can facilitate taking more tactical decisions about what to do with limited budgets.

Inevitably, every organisation delivering environmental education has different reasons for doing so, and even within an organisation, objectives vary from programme to programme. There would be no advantage in different organisations and programmes working towards precisely the same objectives. However, there are some fundamental areas of learning that may be broad enough to have relevance for a significant number of organisations engaged with nature conservation.

BBOWT educators identified four key spheres that seem to be fundamental to developing a rounded appreciation and understanding of wildlife and its habitats:

1. Knowledge about wildlife
2. Confidence in the natural world
3. Awareness of how to engage with outdoor environments
4. Feeling for nature

1. Perhaps the most obvious aim of environmental education is to teach children knowledge of nature. We want them to know about and understand habitats and the wildlife that they support. Knowledge *per se* is fundamental to the wider objective of facilitating sympathy for and identification with the environment. Even the simple act of naming animals gives us a connection to them. It helps us observe, remember and talk about them, all activities that encourage us to care about their fortunes.

2. Confidence is clearly fundamental, as children (and adults) who are not confident in nature do not enjoy it and are not likely to seek it out. Confidence in nature is not the same as self-confidence in general - children can be confident in an indoor environment, but thrown off balance by the unfamiliar aspects of a woodland or the challenges of mud.

3. Awareness of basic techniques for wildlife spotting makes a significant difference to successful engagement. It is a lot easier to have positive environmental experiences if you are well protected from the rain and take binoculars, than if you are cold and shouting.

4. Perhaps more than anything else, what we hope for is that through our teaching and guiding, environmental educators will facilitate the development of children's feelings for nature. We find satisfaction in children's enjoyment of environmental education sessions because enjoyment shows us that it has impacted children where it counts - at the level of feelings. Feeling a physical and emotional connection with the natural world may well be the most important learning outcome of all.

Knowledge, confidence, skills and feelings form the cornerstones of positive attitudes and interest and together should lay the foundation of appreciation of the natural world. For this reason, it was impact on these four aspects of environmental education that we set out to investigate.

We were impressed and delighted…..

We worked with Caldecott Primary School in Abingdon to measure the learning achieved around knowledge about, confidence with, awareness of and feeling for nature from an environmental education session. We started by evaluating three classes of mixed Year 1 and 2 children with respect to these four areas. The children then attended an environmental exploration day at BBOWT's Sutton Courtenay Environmental Education centre. After their visits, we evaluated the children again, using the same methods as before.
The results of these before and after evaluations impressed and delighted us because they showed real impact in all four areas. A one-day environmental exploration day increased children's knowledge of local wildlife and it enhanced their confidence in handling natural materials and how comfortable they felt with the idea of going out in muddy conditions. It improved their awareness of how to engage with outdoor environments, and most dramatically of all, it strengthened the children's association of nature with their senses.

All of this adds up to very positive validation of the potential for environmental education to impact children's appreciation of the natural world. It provides encouraging indications that environmental educational sessions are likely to be having not only the broad social benefits associated with outdoor learning more generally, but also meeting the specific aims of the environmental sector to enhance children's relationship with their environment and the wildlife it supports.

... but also surprised

The results also surprised us, and gave the BBOWT education team unexpected feedback about the way those impacts work. Despite being just one year different in age and taking part in the same visit, the Year 1 and Year

p17 HORIZONS Magazine No 69

2 children performed very differently in the evaluation exercise. For the most part, not only did Year 2 children have higher starting levels in the areas we measured, they also showed significantly more increase in those levels than the Year 1 children following the visit to Sutton Courtenay.

Their knowledge of animals that live in four British habitats went up. Interviewers showed the children photographs of a woodland, a meadow, a pond and a pile of logs and asked them to name animals that might live there. While both sets of children could name more creatures that might be found in those habitats after the visit, the Year 2 children's improvement was almost double that of the Year 1 children. To start, Year 1 children named an average of 2.4 creatures for each habitat, which increased by 12% to 2.7. After the same experience, Year 2 children increased the number of creatures named from 2.6 to 3.1, a gain of 20%, nearly twice as much as the Year 1s[5].

Their confidence with nature also increased. Children were given a tray of four natural materials (twigs, leaves, mud and stones) to explore. The number of different materials engaged with by Year 1 children stayed static at around 2.8 of the materials each. However, the Year 2 children went from handing 2.6 different materials each to 3.2, a 23% gain.

Confidence was also investigated through a direct question about how the children felt about playing in a muddy place that we showed them in a photograph. After the nature exploration day, Year 1 children showed a modest 4% rise in their willingness to go into the muddy environment, while the Year 2 children showed a 14% rise, more than three times as much gain.

The Year 2 children also outstripped their Year 1 counterparts in the improvement of their awareness of outdoor engagement techniques. We asked them to suggest what we could do to see wildlife on a walk outside. The number of ideas generated by Year 1 children rose from 1.9 per child to 2.3, a 16% increase; but the number from Year 2 children rose from 2 to 2.7, a 35% increase, about double the gain.

So far these numbers suggest that it is easier to make measurable impacts on Year 2 children's appreciation of the environment. Our six- to seven-year-olds demonstrated two to three times the learning of our five- to six-year-olds. This is itself surprising, and potentially useful in considering where to focus limited resources for greatest impact.

... and curious

The results became even more interesting when the analysis turned to children's association of nature with their physical perception of the world. Interviewers had the children name things they could think of to see, hear, touch and smell in a garden, and we counted the number of their responses relating to the natural world. In this category, and only in this category, the Year 1 children outstripped the Year 2 children, and they did so by a substantial margin.

Before the sessions, Year 1 children associated an average of 1 natural thing with each of their four senses (not counting taste), while Year 2 children could think of 1.1 for each. After the session, the Year 2 children increased the number to 1.4. However, after the session, the Year 1s overtook the Year 2s, reaching an average of 1.5 natural things per child per for each of the four senses. The increase for Year 2 children was 23%, while the increase for Year 1 children was 50%. Fifty per cent was the biggest increase in any of the areas we measured, and the differential of 27% between the two groups was the greatest of any of the areas as well. The Year 1s increase in natural sensory associations was double that of the Year 2s at the same time as it completely reversed the relationship between the relative learning of the other measures.

The disparity between the results for the association of sensory feeling with the natural world and all the other areas studied is food for thought. It suggests that the differences are not attributable just to overall development of learning capacity or maturity with regard to the evaluation. These different aspects of our environmental education session impacted different age groups differently.

This result provides evidential justification for the different emphases already given to the content and delivery methods of sessions aimed at different age groups by BBOWT and other environmental education providers. It could also help make such differentiation more tactical. Sessions aimed at Early Years children often emphasise sensory appreciation of wildlife. This study suggests that there are significant benefits to this emphasis through Year 1, but by Year 2 pupils are clearly ready for a shift of focus to more knowledge - and skill-based learning. And while it is vital to give young children a feeling of confidence in undertaking environmental education sessions, Year 1 is perhaps not the time to worry particularly about developing that aspect of their relationship with the outdoor environments where we work.

These results can help refine planning in order to achieve the greatest environmental benefit from environmental education work. It is arguably the case that feelings and the emotional attachment they help to form may be the area where environmental education can have the greatest impact on children's lifelong connection with the natural world. If there is evidence that we can affect feelings to a significant degree by focusing on that aspect of our work with younger children, we should be making sure that we work with as many children of this age as possible, and

we should be working hard to ensure that the programmes we deliver to those younger children give them copious opportunities to develop their positive feelings about the natural world.

Ways forward

BBOWT's study measured something that we felt intuitively to be the case: not only is environmental education good for children, it is also a 'good thing' for the environment. By extending children's ability to engage with the environment, we lay the ground for them to go forward with greater appreciation of nature and the consequent motivation to care for it.

Conservation organisations' thinking about and funding of environmental education could become better informed if such evidence were available. Having the ability to implement evidence-based improvements could enhance the quality of the education that the environment sector delivers, and it could enable organisational decision-making to be informed by evidence of impact. More methodical consideration of what can be effectively achieved around educating people about the natural world would make the sector's work more effective and purposeful. ■

NOTES

1.The English Outdoor Council's 'Time for Change in Outdoor Learning' (2010) cites a number of relevant studies and pieces of evidence: http://www.englishoutdoorcouncil.org/wp-content/uploads/Change.pdf (accessed 9 Jan 2014)

2. The London Sustainable Development Commission (LSDC) reviewed much of the evidence for the benefits of children's engagement with nature for the Greater London Authority in 2011: http://www.londonsdc.org/documents/Children%20and%20Nature%20-%20Literature%20Review.pdf (accessed on 9 Jan 2014). Additional studies are cited by 'Beyond Barriers to Learning Outside the Classroom in the Natural Environment' by Kings College London (2010): http://www.lotc.org.uk/2011/04/beyond-barriers-to-lotc-in-the-natural-environment/ (accessed 9 Jan 2014).

3. LSDC, note 1 above, p. 8 and passim.

4. Sara Knight has summarised the evidence with regard to Forest School in particular in an on-line paper 'Can Forest School Act as a Spur to Better Quality Outdoor Experiences?' http://www.tactyc.org.uk/pdfs/Reflection-Knight.pdf (accessed 9 Jan 2014).

5. Slight discrepancies between the percentages and the raw data are due to the actual quantities having been rounded to just a single decimal place for ease of reading.

About the author

Dr Athene Reiss

I worked for the Berkshire, Buckinghamshire and Oxfordshire Wildlife Trust as an environmental educator and manager until recently, and the project described here was carried out in that role. I now work for the Hamilton Trust on other types of education projects. I am confident that there is much more to be learned about the success of environmental education with regard to specifically environmental outcomes. For example, the relationship between age and learning deserves further investigation, and I hope to do more work in this area. I'd be very interested to hear from environmental educators or schools that would be interested in potentially being a partner in that work.

Photographs - from the author