

Nature of experience: engaging special needs learners through the natural world

In an increasingly urbanised-world **Dawn Sanders, Jessica Duemler and Elizabeth Hartman** look at the benefits of working with nature and natural objects for children and teachers in a special needs school.

If a curriculum is to be effective in the classroom it must contain different ways of activating children...a curriculum, in short, must contain many tracks leading to the same general goal

Bruner, 2004

Background

A 'nature-deficit' world

Policymakers, researchers and educators are realising that in an increasingly urbanised world many children and young people are growing up in a 'nature-deficit' society, and that education has a key role to play in building a stronger relationship between the natural world and modern humanity. Policies, such as the UK Governments' *Learning Outside the Classroom Manifesto* and grassroots movements, such as the *Children and Nature Network* are seeking to set in place experiences with nature as a common event in school and family life.

'Nature of Experience'

Our response to this socio-educational challenge has been to explore the opportunities that working with nature and natural objects might afford our community

of teachers and learners. The Japanese practice of lesson study has influenced our journey:

There are three main activities that make up lesson study: (1) identifying a lesson study research theme; (2) conducting a small number of research lessons that explore this theme; and (3) reflecting on the process, which includes producing written reports.

Yoshida, 2002



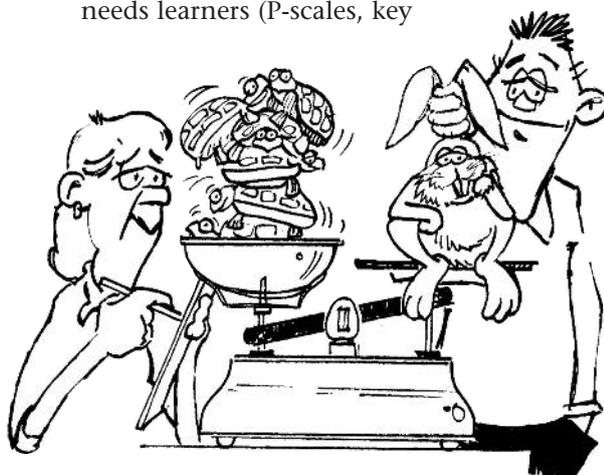
The key aims of this two-year programme were to:

- develop nature-based activities both within and beyond the classroom and document the impacts of these activities on both teaching and learning
- facilitate teacher reflection and peer-review through filming, photography, and discussion of lessons, one to one sessions and informal play breaks
- be a part of wider educational dialogues by reading the work of others and writing about our own observations and reflections.

To facilitate our reflection journey we used:

- training
- modelling
- partnership teaching
- learning conversations.

All the staff undertook a one day CPD programme to discuss and develop the new approach to the school curriculum, followed by several terms of after school meetings to embed it into practice. The head teacher and science teacher worked with each other, and in partnership with colleagues throughout the school, to support the development of a nature-based curriculum based on the needs of a diverse community of special needs learners (P-scales, key



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stage 1 and key stage 2) alongside the development of prototype planning and assessment frameworks.

Research we drew on

We drew on the research work of Taylor *et al.* (2001) on the impacts of children working in natural green settings and research published on the children and nature network site.

As a team we reviewed the article 'Refuge and imagination: places of peace in childhood' Kimberley Dovey (1990) as a prelude to staff participating in a paired activity where they considered places and actions from childhood and discussing where and when our children are given these kinds of nature-based environments during the school day.

Our children

All of our children have learning difficulties. A few have mobility challenges and several are on the autistic spectrum. Our children prefer visual learning to auditory cues and do not respond well to long auditory introductions to topics. Some of the children are non-verbal. Many of them react positively to sensory stimuli, particularly when they can focus on individual organisms. We collected the following evidence as part of our study:

- pupil progress data
- observation outcomes (filmed lessons, one to one sessions, photographic sequences)
- pupils' work.

Impact on pupil learning

As a teaching and therapeutic team we were keen to make an impact on learner engagement in relation to:

- developing vocabulary and expressive skills

- focusing visual attention
- increasing levels of comprehension
- learning to look, process and question
- increasing motivation to complete problem solving tasks
- increased engagement with learning across our learner community.

In witnessing our children's interactions with nature, reading research and filming our lessons, we have recognised the social, emotional and cognitive benefits that connecting with the natural world can bring to our community of special needs learners. Inspired by this experience we have developed a new approach to teaching, one which integrates internal and external learning environments, anchored in nature studies, throughout our cross-curricular programmes. Since embarking on this developmental journey we have recorded positive impacts on our learners' individual academic profiles and our own professional development.

Impacts on learning

When you have seen one ant, one bird, one tree – you have not seen them all.

E.O. Wilson (quoted in Murphy and Dorfman, 1986)

Children are now seeking out organisms in our garden and consolidating earlier learning experiences. They are able to see first hand, and in their own processing time, what they have only briefly experienced in the classroom on a much smaller scale. This experiential process has drawn previously silent children towards speech, offers a framework for reflection and rewarding opportunities to apply their new knowledge. By bringing woodlice, worms, plants and snails into the classroom we have, through tiny moments of interactions with these organisms, started to build pedagogical fluidity between the school garden and the

children's classrooms. After two months we noticed changes in our children's behaviour and language, motivation levels were increasing in many of our students – this was particularly noticeable in maths lessons.

I have found that children are more engaged when using natural materials within my maths lessons. The children were able to develop a better understanding of many mathematical concepts such as recognition of colours, matching, patterns, and size by using natural objects such as leaves, rocks, wood, and small creatures. I was able to increase motivation to complete mathematical problem-solving tasks such as addition, subtraction, regrouping and measuring by using examples based on the nature theme, in which children are very interested.

Andrea, maths teacher.

After a year and a half, children are generating their own informal, peer-to-peer interactions, including shared language.

The amount of times our children talk about the environment has increased.

When outside, children are looking under trees, under tables, in the grass. They are exploring for themselves.

Children are spontaneously seeking and finding snails and worms in the garden, showing them to each other and informally sharing observations and specimens.

Research by Taylor *et al.* (2001) has demonstrated that 'activities in natural green settings were far more likely to leave children with attention deficit disorder (ADD) better able to focus and concentrate'. Our project utilises their research findings and others to inform our evolving practice.

Learning modalities

Our science lessons are planned around specific learning modalities that can overlap or remain distinct, depending on a child's ways of engaging:

- tactile interaction
- open exploration through enquiry
- questioning and hypothesising
- reflection.

Communicating through talk, signing or gestures is a common thread throughout, as is the development of thinking skills. As educators we recognise the importance of learner centred learning and plan our lessons with open exploration spaces built in, so that we can be responsive to the conceptual tracks our students might take in relation to the topic, and the home experiences they may bring in. By recording many of our lessons on film, using small unobtrusive 'Flip' cameras, we have captured moments of engagement, that otherwise may have been missed, such as when a non-verbal student mirrored the tentacles of a snail with his fingers, and with the support of his teacher, gently tested its sensitivity to environmental stimuli.

Assessment

The knowing that occurs through encounters with the natural world that involve appreciation for and understanding of the various flora and fauna, recognition of species membership, and the ability to relate to living organisms. It uses such tools as hands-on labs, field- trips, sensory stimulation, and attempts to classify and comprehend natural patterns
Lazear, 1999

We have found David Lazear's work on 'naturalist intelligence' a useful basis for reflecting on a nature based developmental framework (see Box1). This is an area on which we are still working.

Box 1 The three competency levels of Lazear's work

Basic skill level

Child uses informal, intuitive forms of categorisation such as an object is 'tree-like', and 'has an innate curiosity about and desire to explore the natural world'.

Complex skill level

This involves 'more formal systems of identifying and classifying plants and animals, and more precise approaches to interacting with and investigating them'.

Coherence level

The most formal level where natural history disciplines such as botany and entomology are used 'to further understand, appreciate, use, and converse about the natural world'.

Source: Lazear (1999, p. 38)

The majority of our students work at the basic level with a small group working at the complex skills level. These boundaries however, are not fixed and occasionally a child will make forays into both the complex skills level and the coherence level, particularly when clear scaffolding is offered to the learner by both their peers and their teachers. These moments are further enhanced by post-lesson communications between the learner and teacher as part of their individual lesson reflection. This evidence has been captured through our individual pupil progress data, observation outcomes and in pupils' work.

Evidence of impact on teaching

Each academic year we ask teachers and therapists to produce a statement of the

impact of the project on their teaching. Here is a selection from last year:

Liana (occupational therapist)

Using nature in the classroom has given me an opportunity to engage the children in meaningful exploration of the world around them, using their own experiences and drawing from their own lives. For our community of children this has helped them to become better observers of their own environment and given them the skills to look, to process, to question. As a teacher this programme has given me a framework to expand learning possibilities, both in the classroom and outside of the classroom, using the children's observations and new motivations to guide my lessons.

Iwona (music and movement teacher)

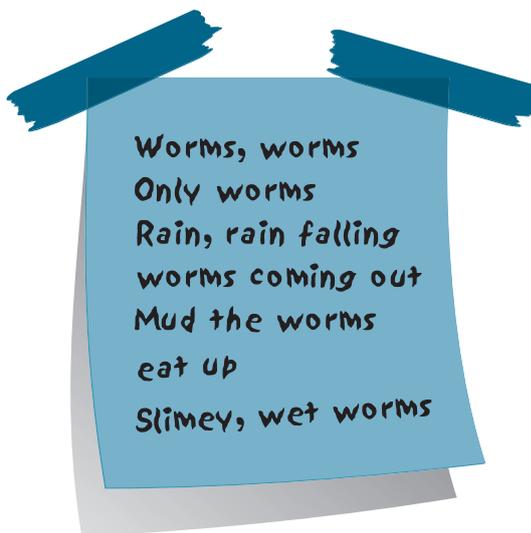
Using music with nature gave children more opportunities to extend their learning and understanding of both subjects. The children are becoming more sensitive to the sounds around them in nature and this experience has opened their ears to the world.

Jessica (literacy teacher)

As our children have had all aspects of nature incorporated through their lessons they have brought new and innovative ideas, insights and questions into their learning experience. Their level of comprehension has increased dramatically. Exploring the natural world in such a sensory way has enabled all the children to engage with the lessons and explore in their own unique ways.

The project has further stimulated teacher reflection on the following areas:

- questioning between teachers and learners
- developing the spaces available to us
- finding kinaesthetic ways of working with learners
- building opportunities for expression and verbal development
- exploring dynamic and multiple entry points into a child's engagement
- leaving spaces in our lessons for spontaneous interactions



Example of literacy work of key stage 2 learner with emotional and behavioural difficulties combined with speech and language delay

- developing places of refuge and imagination for individual children
- thinking about the questions we need to ask ourselves
- finding a place for adventure/exploring time
- enabling peer modelling across our community of children
- creating opportunities to extend learning experiences
- incorporating inside and outside the classroom
- supporting children 'learning to look'
- working with children to create a learning space
- using photographs and films to connect individual children to a field-trip experience.

Places of refuge and imagination

The outdoors offers children freedom to explore different ways of being, feeling, behaving and interacting.

Ryder Richardson, 2006

We are now considering how the places of refuge children find in books and their imagination can be supported by creative play within nature-based settings.

Micro-worlds in which children discover, explore, create, reflect, communicate and dramatise, as Cobb (1994) so aptly describes:

Nature for the child is sheer sensory experience, although any child can draw in the wings of his surroundings at will and convert the self into a 'theatre of perception' in which he is at once producer, dramatist and star. Therefore, the child's world, his surroundings, are not separated into nature and artefact.

Cobb, 1994

Using animal puppets can create a doorway for children to enter imaginary and natural worlds simultaneously. We have found that children refer back to these sessions and draw on them in other learning contexts.

By building crawl and hide spaces in our edible jungle garden they have the opportunity to step inside different worlds, likewise by using hand lenses they can bring tiny habitats to life.

And then there is the world of little things seen all too seldom. Many children, perhaps because they themselves are small and closer to the ground than we, notice and delight in the small and inconspicuous. With this beginning, it is easy to share with them the beauties we usually miss because we look too hastily, seeing the whole and not its parts. Some of nature's most exquisite handiwork is on a miniature scale, as anyone knows who has applied a magnifying glass to a snowflake.

Carson, 1999

Senior management support

Our school director, Libby Hartman is committed to a nature-based education ethos informing our school programme and



learning environments. To this end she supports us through critical friendship, funding and resources.

A recent research report, *Every Experience Matters* by Professor Karen Malone, indicates that learning outside the classroom has a significant impact on children's learning, children's physical experiences, social interaction, emotional well-being and responses. These changes we have witnessed through our 'Nature of Experience' programme.

Further developments

We are planning a one day CPD course- *Experiencing Nature: Strategies for Engaging the SEN Learner* at the London Science Learning Centre 2010 and will be developing associated learning resources.

How can I do this at my school?

These are some ideas of how you can do a similar project at your school.

- Review your current use of nature-based environments and natural objects as a whole school team.
- Use a shared research reading on nature-based learning environments as a catalyst for discussion on how regular contact with nature could be part of school culture.
- Discuss lesson-study as a reflective tool for your teaching team-would it work for us?
- If yes, decide on your question and interventions and clarify common understandings e.g. what counts as 'evidence', how do we critique each other?
- Run a micro-study taster project, perhaps in one year group, and plan for a bigger whole school activity later on in the year.



We have also used the Learning Outside The Classroom manifesto to inform our work www.lotc.org.uk and the research report *Every Experience Matters* (Malone, 2008) www.face-online.org.uk/index.php?Itemid=850&id=1308&option=com_content&task=view

This project was supported by a field equipment grant from the British Ecological Society to enable purchase of magnifiers and FSC identification charts.

The history of nature education

We have drawn extensively on the work of 19th and 20th century nature study educators, authors such as Liberty Hyde Bailey, Eliza Brightwen, John Henry Comstock and Anna Botsford Comstock, to create our programme.

Comstock, J.H. and Comstock, A.B. (1897). *Insect Life: an Introduction to Nature Study and a Guide for Teachers, Students and Others Interested in Out-of-Door Life*. New York, NY: D. Appleton & Company.

Bailey, L.H. (1898). *First Lessons with Plants: Being an Abridgment of Lessons with Plants: Suggestions for Seeing and Interpreting Some of the Common forms of Vegetation*. London: Macmillan and Co.

Brightwen, E. and Carreras, T. (1897). *Glimpses into Plant-Life: an Easy Guide to the Study of Botany*. London: T. Fisher Unwin.

Weblinks

Our dokuwiki lists the resources on which we have drawn and shares the development of the project. We are currently developing a shared PDF based planning and assessment tool based on our project, which will soon be available as a download.

<http://natureofexperience.com>

The website, Children and Nature Network, contains lots of useful research and programme resources.

www.childrenandnature.org

The Teacher's Blog, 'Passionately Curious-Days Spent As A Second Grade Teacher' is a resource we use regularly

<http://passionatelycurious.typepad.com>

About the authors

Dawn Sanders has taught botanical education for many years and her doctoral study questioned the educational role of botanical gardens. As a freelance teacher and researcher Dawn is inspired by working collaboratively in nature-based settings to engage learners.

Jessica Duemler has a degree in SEN from the University of Wisconsin where Jessica also earned a certificate in Environmental Education. As Head Teacher at The CGC she is able to implement her training in DIR (Developmental, Individual Difference, Relationship-based assessment model) and ABA (Applied Behaviour Analysis model).

Libby Hartman, founder and director started the school in September 1997. Libby believes that 'The world is changing too quickly to use the past as our only model for the future. In every decision we make within the school we ask ourselves the questions: What is best for the child? What is needed to prepare for the future? It is a simple exercise, which provides clarity and directs our actions. The only true evaluation of a learning environment is the measure of academic and emotional growth experienced by each child within that environment.'

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