The serious work of learning about sustainability in the early years: lessons about children’s views on real work and learning relevant to all teachers

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AMY CUTTER-MACKENZIE, SUSAN EDWARDS and HELEN WIDDOP QUINTON present research into the views of children in the early years about what constitutes real work and learning for sustainability.

What’s learning, what’s work and what’s play? Which category do children view environmental and sustainability activities as belonging to?

Even young children have definite views about what constitutes work, learning and play. We were interested to discover that young children were able to articulate concepts about waste minimisation, water quality and plant propagation and that children tended to classify activities around these concepts as real and valuable work. In a recent study of early years settings that investigated the connections between children’s acquisition of conceptual knowledge and different pedagogical approaches we gained insights into children’s perceptions and pedagogical approaches that successfully navigate a balance between the student/child-centred and teacher-directed disconnect that are relevant to teachers at all levels.

The importance of environmental education in the early years

Environmental education as a term had its first international airing at an IUCN conference in 1948 (Palmer, 1998). However, nature-based educational experience, one of environmental education’s key educational approaches, has foundations in the genteel natural history studies pursuits of educated Europeans of the 1700s, 1800s and early 1900s (such as John and Elizabeth Gould after which the centenary-old Gould League is named) and in the work of Dewey (1966) and others (see Palmer, 1998). Australia’s indigenous peoples who inhabited Australia long before Europeans also have a culture grounded in connecting to the environment (Flannery, 2002).

Nature-based environmental experiences in the early years of learning have long been a practice in the Reggio Emilio approach. Here, the environment is viewed as the ‘third teacher’ (Fraser & Gestwicki, 2002). A recent swing back into nature-based learning can be seen in education broadly due to a convergence of an increase in school grounds gardening and greening programs and attention given in the popular media by the emotive push of the term ‘nature-deficit disorder’ popularised by author and journalist Richard Louv (2005; 2009). This increasing prevalence of environmental education activities has also been seen in early years settings in Victoria, with educators using the inspiration of Reggio Emilio and the European Nature Kindergartens (Warden, 2011).

Ever since Rachel Carson published her pivotal book Silent Spring in 1962, so highlighting the detrimental environmental effects of pesticide use, there has been an awareness and concern for the environment in the general population. In more recent times looming environmental crises, particularly climate change, have illuminated the need for more environmentally sustainable approaches. Education has been repeatedly identified internationally as the most proactive means of addressing environmental problems since the 1970s (Gothenburg Centre for Environment and Sustainability (GMV), 2008; UNESCO - UNEP, 2007; UNESCO, 2009). Thus environmental education (and more broadly issues of sustainability) have risen to prominence in all education sectors. This is reflected in the Australian National Curriculum that has sustainability as a cross-curriculum priority (Australian Curriculum Assessment and Reporting Authority (ACARA), 2012) and in The Early Years Learning Framework for Australia (Department of Education Employment and Workplace Relations (DEEWR), 2009) where environmental education and the use of outdoor learning spaces are seen as important aspects of early years learning.

Seeking the insider view – the call for obtaining children’s perceptions in environmental education

Alongside the emergence of environmental education as an important learning area in the early years, there has been an emerging trend in educational research to gain the “insider’s” perspective. Whilst research in preschools was once focussed on observing and inferring what the children are experiencing, however, newer perspectives now emphasise the role of children as active participants in research (Waller & Bitou, 2011). Child-framed research methodologies that involve the children as partners or participants in the research activities (Barratt Hacking, Cutter-Mackenzie, & Barratt, 2012) provide a means for children in early years settings to contribute their perspectives to research data. Within environmental education research it has been identified that there is lack of information relating to the perceptions of learners and the processes of environmental learning and that the ‘voice’ of children in environmental education experiences has not been heard sufficiently (Rickinson, 2001; Rickinson, Lundholm, & Hopwood, 2009). Whilst focussed on children’s learning about sustainability through different pedagogies our project was also an attempt to gauge young children’s voices on their environmental learning through play in early childhood education.
Open-ended experiential education intersecting with play

Much of the early years curriculum is based on learning through experience, with teachers scaffolding children’s interactions with environments, materials and people to support their learning. Such learning experiences or experiential education have been a long-standing pedagogical approach in education that has its foundations in the work of John Dewey (1966) where the learner makes sense of the world and creates their own understandings through direct personal interaction with their environment. In early years settings this is termed play-based learning and is identified as one of the foundations of the Early Years Learning Framework (EYLF) for Australia (Department of Education Employment and Workplace Relations (DEEWR), 2009). In the primary and secondary education sectors such exploratory experiences are included in activities such as science experiments, immersion activities to introduce an inquiry, the Engagement phase of the 5Es Instructional Model (Bybee et al., 2006) and in traditional nature-based environmental education experiences (for example refer to the work of Cornell, 1979) – all of which resonate with our notion of ‘play’.

Three play pedagogies in the early years

Our research project examining play-based approaches to teaching and learning (as a way of gauging environmental learning) in early childhood education arose from concerns expressed by ourselves and others (Hedges & Cullen, 2005; Langford, 2010) that suggested a predominance of open-ended play activities is not sufficient for supporting children’s development of conceptual knowledge; instead children’s play needs to be directed by a purpose where their play activity has been connected to a learning outcome and designed by the teacher to scaffold this learning. Therefore our research project focused on investigating three types of play approaches in early childhood settings, as in the table below:

<table>
<thead>
<tr>
<th>Open-ended Play:</th>
<th>Modelled Play:</th>
<th>Purposefully framed play:</th>
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<td>Children are provided with materials related to a concept. There is little or no discussion or modelling with the materials. Children are left to participate in open-ended play with the materials, creating their own understandings and concepts.</td>
<td>Teachers demonstrate how the materials provided could be used to realise an environmental or sustainability goal. Children then participate in the play experience with the materials following the modelling by the teacher.</td>
<td>Children are provided with materials and participate in open-ended-play. Following the open-ended-play experience, the teacher models how the material could be used and engages in discussion with the children about the activity. Children continue to participate in the play experience following the open-ended play, modellng and discussion</td>
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The research project methodology

Our research methodology made extensive use of video and video-cued recall interviews with children and teachers, an increasingly popular approach used in educational research to gain the insider’s view of the teaching and learning activities. A total of 18 early childhood education settings participated in the project, and two settings in the pilot study preceding the main project\(^1\). The data collection for the project involved the following sequence of activities involving the teachers, children and researchers:

1. Participating teachers and the researchers engaged in a preparatory professional learning session. Teachers were assigned a sequence for implementing the three play pedagogies (this sequence varied from site to site).
2. Teachers designed the play-based learning experiences (according to play type), recording this in their usual program planning format and reflecting on justifications in their research journals.
3. The planned play experiences were implemented with the children and video recorded.
4. The children participated in a video-recall interview with the researchers where they watched footage of themselves engaged in the play experience and participated in a small group interview (also video recorded) about the experience.
5. The teachers then watched and commented on both the original play footage and the recordings of the children interpreting their play and learning in the video-recall interview (also video recorded).

We decided to use video recording as our chief data collection method because this approach can easily be used to access the children’s analyses and perceptions of learning activities and because this aligns with a child-framed research methodology (Barratt Hacking et al., 2012). We were keen to not only hear what children had to say about their participation in the play experience, but also to see how they would respond to the footage of their play episodes. Then by showing the teachers the
footage of the children commenting on the initial play experiences we hoped to see how the teachers responded to the children’s perceptions of their learning and if they identified any discrepancies between what they believed were the concepts embedded in the play experiences they had designed and what the children were able to describe as having learnt.

A focus on biodiversity
To maintain consistency across the research sites, the teachers participating in the research were asked to specifically focus on biodiversity in the design and implementation of the play experiences. Figure 1 illustrates possible conceptual scenarios suitable for an early years context that can be derived from biodiversity. Our previous research has suggested that concepts associated with sustainability (such as biodiversity) represent appropriate areas for investigating children’s learning as they are conceptually rich and often grounded in children’s and teachers’ lived experiences (Cutter-Mackenzie & Edwards, 2006). Focussing specifically on biodiversity also had the benefit of standardising the conceptual content of the experiences across the preschools participating in the research project.

Research findings on what the children and teachers viewed as important
Preliminary findings from our research indicate that there is a difference in learning outcomes resulting from the three play pedagogies. In general, when engaged in open-ended play the children report that they have learnt nothing and that they were just playing; commenting on modelled play, they are able to describe the activity and the purpose of the activity but not necessarily the conceptual ideas related to the goal; lastly, when analysing purposefully-framed play, the children are generally able to describe the goal and outcome of the activity and to identify some of the conceptual ideas related to the activity. The following commentary about purposefully-framed play is an example of the children’s perceptions of this type of learning activity:

Researcher: Before you said you recycled water. How did you do that?
Child 1: The dirt couldn’t go through so the water came out clean.
Researcher: Do you think you learnt that by yourself or did Mary show you?
Child 1: Mary showed us to put it in the bottle and then the water and then it came out clean. We thought it looked easy.
Researcher: What if she didn’t show you, do you think you would have been able to do it?
Child 2: I would know.
Child 3: I would.
Child 1: I would have because we would know where to put the stuff because the only place to put it is in the bottle.
Child 3: You could have put it in the other container instead.
Researcher: Do you like it when Mary shows you how to do it?
Child 1: Yes.
Child 2: It was fun.
Researcher: What did you do with the water afterwards?
Child 1: We gave it to the vegie garden.

Figure 1: Possible biodiversity conceptual scenarios for planning of the play pedagogies.
Early analysis of our results indicate that the teachers found researching the three play pedagogies challenged their thinking about the children’s acquisition of conceptual knowledge and about their planning for what they wanted the children to learn and how they would scaffold this. One teacher commented:

I feel that this in some ways [this process] has shown me that I underestimated what kindergarten children are actually capable of learning. I now need to broaden and extend my planning.

The incorporation of video footage in the interview process acted as powerful tool for reflection and professional learning for the teachers, enabling them to appraise and re-evaluate their own practice. In doing so some of the teachers proposed that the three play pedagogies could be integrated into an intentional teaching/play mix to support the children’s development of deep conceptual learning. One teacher commented:

I think with a science concept it needs to be modelled. It needs to have teacher interaction and direction. I think with a specific activity it needs to have some teacher interaction. Open-ended is important for imaginative play and socio-dramatic play. I don’t think a child will just go and make a worm form for open-ended play. Something like this needs to be modelled and discussed.

This finding builds on existing research which emphasises the importance of teacher interactions during play (see for example Hatch, 2010; Wallerstedt & Pramling, 2012). Open-ended play can be used to explore the properties of materials that might be used in modelled play to illustrate particular content knowledge, while the illustrations from modelled play can form the basis of child–teacher interactions and discussions during purposefully framed play. In this way, no one play approach is positioned as having greater pedagogical value than another – rather they each offer pedagogical strengths which can be harnessed to help children begin to explore and understand content knowledge associated with different aspects of environmental education.

An unexpected outcome from the research was children’s categorisation of activities related to biodiversity and sustainability as work not play. The same group of children that were discussing the water filtration activity recounted above made a clear distinction about the activity as real work, not play:

Researcher: Were you playing or learning?
Child 1: We were learning to recycle water.
Researcher: What is playing then?
Child 1: When you just play with something and then put it back.

Similar conversations resulted with other children in different settings focusing on waste sorting and planting and plant care activities. Consistently the children viewed these activities as important work (“working like our dads”) with real purpose as opposed to playing that was seen as “running around and doing stuff” and interacting with toys.

The value and importance that the children attached to what they see as work resonates with similar findings from research with much older children. Successful strategies for connecting disengaged adolescents with learning are based around making learning experiences relevant (Rickinson et al., 2009; Victorian Department of Education and Training, 2002). Environmentally-based learning activities have a head start in that they frequently have a direct connection to the children’s real world and have tangible outcomes and purposes. Similar to the children in the preschools involved in our research, adolescents judge ‘real’ learning activities with a purpose as worthwhile and not just ‘fake’ projects (Fusco, 2001).

Lessons for all teachers spotlighted by the research

As teachers we need to guard against underestimating what our students are capable of understanding and achieving. As our research has demonstrated, even young children can comprehend complex concepts related to biodiversity and sustainability. At all levels of education we need to engage our students with challenging and relevant learning activities.

The children in our study valued the learning activities they identified as ‘work’ – those that related to real world activities they had participated in with their families or those that had a communal benefit, such as recycling so that “it would (not) turn to a waste land” as one child posed. The challenge to all teachers is to utilise real world environmental and sustainability activities to make learning meaningful and purposeful and in so doing connect to young people’s view of what is real.

Teaching is a complex endeavour. Teachers cater to the intellectual, physical and wellbeing needs of their students by supporting their learning and development through employing a variety of strategies. Our research project has highlighted the importance of integrating a range of teaching and learning pedagogies to support conceptual knowledge development about sustainability in early years learning settings. The teachers involved in our study found it beneficial to take time to reflect on their practices and concluded that their students are better supported in their learning with an integrated mix of pedagogies. As renowned environmental educator David Orr puts it, “the way learning occurs is as important as the content of particular courses” (1991, p. 54).
References


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