Early Childhood Australia’s

Best of Sustainability
Research, Practice and Theory

Sue Elliott,
Susan Edwards,
Julie Davis and
Amy Cutter-Mackenzie
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About Early Childhood Australia
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Acknowledgement of Country
Early Childhood Australia acknowledges the traditional owners of Country throughout Australia and their continuing connection to land and community. We pay our respects to them and their cultures, and to the Elders both past and present.
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Introduction

Seemingly straightforward tasks often have a way of becoming complex. This was the case for our guest editorial team charged with creating Early Childhood Australia’s Best of Sustainability publication drawn from the Australasian Journal of Early Childhood and Every Child. The complexities we encountered ranged from the varied terminologies and understandings of constructs such as education for sustainable development, environmental education and education for sustainability, through to the fundamental lack of published research on which to draw as the basis for a special issue. It is timely to explore these complexities as we face the global challenges of The Critical Decade (DCCEE, 2011) including rising sea levels, extreme weather events and food security. At a local level, the early childhood field in Australia is seeking to interpret sustainability with systemic support from the National Quality Standards (NQS) (ACECQA, 2011), while elsewhere environmental/sustainability education is encouraged through national curricula documents (for example, Singapore Ministry of Education, 2008; Swedish National Agency for Education, 2010; Ministry of Education of Korea, 2011). Both The Critical Decade and the NQS provide imperatives to drive early childhood education’s engagement with sustainability. In other words, sustainability in early childhood education is no longer optional, but essential (Elliott, 2010).

While twenty years of advocacy has led to this somewhat subdued celebratory position, in this publication we recognise the historical contexts that have led to early childhood education for sustainability (ECEfS), as we (Elliott & Davis) phrase it, becoming almost ‘mainstream not marginal’ (Davis, 1999)—a stitching together of the isolated ‘patches of green’, first identified a decade ago by Elliott (NSW EPA, 2003). Here we weave together, through these articles, a story of the evolving history of ECEfS from our particular perspective. In so doing, we also acknowledge that there are other perspectives or ‘paths’ for this field as identified by Cutter-MacKenzie and Edwards in their concluding paper to this compilation.

Evolving constructs:

Environmental science, environmental education, education for sustainability and education for sustainable development ...

The first article in this themed edition by Walsh (1984), focusses on inquiry approaches to environmental science in the early years, and provides an historical benchmark for understanding and thinking about the relationships between environmental education and education for sustainability in early childhood education. In the two decades preceding Walsh’s article, scientists had been alerting the world’s populace to environmental issues and
sought scientific solutions to these problems. There was, however, growing awareness that science alone could not provide all the answers to the environmental issues confronting the world; education was, consequently, envisaged as a key driver in addressing these complex environmental concerns (Gough, 1997). In his article, Walsh (1984) placed emphasis on the importance of scientific knowledge for young children, which correlates with the knowledge focus of other initial early childhood environmental education studies (Lavanchy, 1993; Palmer, 1995). A key point of Walsh’s (1984) article, however, was that ‘simply exposing’ a child to the environment is not enough to ensure environmental knowledge, understandings and empathies. He emphasised that informed and engaged adults were essential to facilitate children’s deeper understandings and connections with the natural world. As others have noted, both direct experiences and significant adults are critical in childhood for building environmental awareness and understandings (see, for example, Chawla’s (1998) significant life experience studies of environmentally-active adults).

Although Walsh (1984) did not specifically employ the term ‘environmental education’, this construct was available at the time of his 1984 publication. For example, ‘environmental education’ (EE), was enshrined in The Belgrade Charter (UNESCO/UNEP, 1975) and then in The Tbilisi Declaration (UNESCO UNEP, 1977), key documents that many see as the beginnings of modern environmental education. These international reports advocated for EE to build awareness and knowledge of human interdependencies with the environment and the promotion of the resolution of environmental issues. Later, in teacher education, environmentally-educated teachers were exhorted to become the ‘priority of priorities’ (UNESCO/UNEP, 1990), a task yet to be realised. In Sauvé’s 2005 review of three decades of environmental education research literature, she offered fifteen currents that informed the pedagogical landscape of environmental education, including naturalist, scientific, systemic and socially critical currents. Walsh’s (1984) paper can be seen as clearly fitting into the earlier phases of thinking about environmental education. The construct ‘environmental education’ alone, offers complexities to provoke reflection and critique by researchers and practitioners alike.

‘Environmental education’ continued to be employed throughout the 1980s until The Brundtland Report (WCED, 1987) and Agenda 21 (UNCED, 1992). These milestones signalled a shift to the use of ‘sustainability’ as the key construct for understanding human development issues, being perceived as a more holistic term that recognised the dynamic interdependencies of social, cultural, political, economic and environmental realms, as well as opening up possibilities for discussions about inter-species equity. Sustainability also encompassed a temporal dimension; it was not simply about humans here and now on planet Earth, but promoted longer-term thinking and actions for intergenerational equity. The construct of sustainability, then, has the potential to broaden the equity discourses that are so valued in the early childhood field. The articles republished here by Hydon (2007), Mackey and Vaealiki (2011), and Sandberg and Arlemalm-Hagser (2011) demonstrate the possibilities for weaving together equity, rights, ethics and sustainability, and reflect the beginnings of an international focus, as demonstrated by authorships arising from Australia, New Zealand and Sweden.

‘Education for sustainability’ is the construct more commonly used in practice in Australia (DEWHA, 2010) and New Zealand (Parliamentary Commissioner for the Environment, 2005) although it is often used interchangeably with environmental education (Commonwealth DEH, 1999; 2005). Internationally, environmental education is frequently cited in North American publications (NAAEE, 2010), while education for sustainable development is more common in European publications (UNESCO, 2005). In the research context, the authors of the republished papers in this publication well illustrate their geographic origins and particular preferences, although our current preference is for ‘education for sustainability’ (Davis, 2010; Elliott, 2012) because we believe this construct offers a more holistic, systems-based and transformative approach to addressing the complexities of sustainability issues that have both local and transnational as well as historical and future dimensions. Interestingly, our own earlier publications—both separately and together—use the environmental education construct as this reflects our own starting points where we understood environmental education as in, about and for the environment—a way of thinking about environmental education that had favour throughout the 1990s.

A review of key Australian documents indicates that education for sustainability is most often characterised by a set of teaching and learning principles (Commonwealth DEH, 2005; Commonwealth DEWHA, 2009) such as holistic, experiential, critically reflective, collaborative,
problem-based, systemic and participatory. There is, however, no one right way to engage in environmental education/education for sustainability as the selected articles by Sandberg and Arlemalm-Hagser (2011) from Sweden and Edwards and Cutter-Mackenzie (2011) from Australia illustrate. Each offers insights into pedagogical approaches relevant to their specific sociocultural contexts, curriculum frameworks, and theoretical orientations. However, drawing on the aims of the United Nations Decade of Education for Sustainable Development (UN DESD 2005–14) (UNESCO, 2005), Davis (2010) and others (Fein, 1993; Sterling, 2001) argue that a transformative education agenda must take precedence over simply being in or learning about the environment. The rationale is that addressing global change is such an urgent priority that participants in early childhood education for sustainability need to feel empowered to act and change their ways of being in the world, and not simply be knowledgeable about the environment.

**A snapshot of history**

In Australia and New Zealand, the history of early childhood environmental education is best characterised by the advocacy catch-cry ‘mainstream not marginal’ first invoked by Davis (1999, p. 2). This phrase called for the positioning of early childhood environmental education as a mainstream concern in the discourses of both early childhood education and environmental education. While the school-based environmental education sector grew quite strongly throughout the 1980s (Gough, 1997), it was not until 1992 that sufficient groundswell of interest led to the establishment of the first environmental education network for early childhood professionals in Victoria, Australia (Environmental Education in Early Childhood (EEEC Vic. Inc.). Subsequent networks were established in Queensland (the Queensland Early Childhood Environmental Education Network, now the Queensland Early Childhood Sustainability Network [QECSN]), and New South Wales (the New South Wales Early Childhood Environmental Education Network [NSW ECEEN]). Nationally, the Australian Association of Environmental Education Early Childhood Special Interest Group (AAEE EC SIG) was founded a decade ago. To date, these state and national networks, with formalised structures for recruitment, dissemination and advocacy are a uniquely Australian grass roots approach to promoting and resourcing change in the early childhood field (Elliott, 2007), not matched elsewhere in the world, although there are a number of looser coalitions overseas.

In 2003, the New South Wales Environment Protection Authority (NSW EPA) commissioned a review of early childhood environmental education across Australia. The metaphor of a patchwork quilt described the ad hoc and somewhat isolated nature of environmental education occurring in early childhood education in Australia, resulting in the now well-known *Patches of Green* (NSW EPA, 2003) report. The ‘patches’ were typified as ‘exemplary individuals, organisations and centres that share a passion and commitment to the importance of early childhood environmental education’ (NSW EPA, 2003, p. 1). Broader systemic uptake of environmental education with resources, support and research was firmly advocated in the review and vigorously reiterated over ensuing years (Davis, 2009; Davis & Elliott, 2007; Tilbury, Coleman & Garlick, 2005).

Since 2003, wider acknowledgment of the role of EE/EfS in Australia has been growing, particularly through local governments (Booth, 2010; Gosford & Wyong Councils, 2007; Hobson’s Bay Council, 2009), professional bodies including Early Childhood Australia (Davis & Elliott, 2003; Kinsella, 2007; 2008; Moore & Young, 2010; Dalton & Young, 2008) and via a number of early childhood education for sustainability conferences in Australia and New Zealand. The Australasian initiatives noted above are also supported by international efforts, predominantly through the work of UNESCO and OMEP (World Organisation for Early Childhood Education). In 2007, the first UNESCO meeting on early childhood education for sustainability published *The Contribution of Early Childhood Education to a Sustainable Society* (UNESCO, 2008a) and the following year a second meeting developed education for sustainable development recommendations inclusive of early childhood (UNESCO, 2008b). While this might not seem a remarkable idea, it marked the first time that the broader field of EE/EfS recognised early childhood in such a way. OMEP has continued to build a sustainability focus through their recent international conferences and publications, thus further promoting education for sustainability in early childhood education (Ang, 2010; Siraj-Blatchford, Smith & Pramling-Samuellson, 2010).

As long-term teachers, researchers, and supporters in this field, we feel vindicated that sustainability as ‘mainstream not marginal’ is becoming a reality in the early childhood field after some twenty years of advocacy and that from the small ‘patches of green’—a quilt coloured by many hues of green—is now just small stitches away.
However, we do continue to question the extent to which the mainstreaming of early childhood education is occurring within the realm of sustainability. How well are young children, for example, deeply acknowledged as key targets, let alone as key participants, in environmental/sustainability programs and projects in schools or community settings? The concluding paper here refers to the potential for multiplicities and interlinking which may well promote further and deeper mainstreaming.

**An emerging research base**

In contrast with the building of local and international practitioner networks that has led to sustainability having an increased presence in early childhood education, there has been a somewhat tardy emergence of research associated with sustainability and environmental education in the early years. Not surprisingly, our guest editorial team located only eight peer-reviewed papers in the entire history of AJEC. In Davis’s (2009) literature search of fourteen internationally prominent early childhood and environmental education/education for sustainability journals over the 12-year period 1996–2007, she found that fewer than five percent of articles focussed on early childhood and environmental education/education for sustainability. Of this small group, Davis (2009) categorised content according to whether they were mainly about education in the environment, education about the environment or education for the environment. Most commonly, articles reported on studies of young children in the environment, such as being engaged experientially with gardening or observing nature. A smaller number of papers reported on research of children acquiring knowledge about the environment. Almost no articles described young children as acting for the environment, thus falling short of a key principle of education for sustainability—as understood by Elliott and Davis—as an education that reflected sociological images of children as capable and competent participants in the world and potential agents for transformative change for sustainability (Fein, 1993; Matthews, 2007; Sterling, 2001). Only in relatively recent years has this latter orientation been explored in early childhood education for sustainability research and presented via conference papers by Australasian authors including Davis et al. (2005), Davis, Elliott and Vaealiki (2008), Duhn with Bachmann and Harris (2010) and Vaealiki and Mackey (2008).

We have previously proposed possible reasons for the tardy emergence of a research base in early childhood education for sustainability (Davis, 2009; Elliott & Davis, 2009).

**EARLY CHILDHOOD AUSTRALIA'S BEST OF SUSTAINABILITY: RESEARCH, PRACTICE AND THEORY**

We expand on these arguments here in order to deepen understandings of the complexities inherent in researching, theoretically and practically, with early childhood education for sustainability.

- Even though sustainability practice has been consolidating in the field through actions such as planting vegetable gardens and teaching about water conservation with young children, practices have mostly been discussed and documented in practitioner literature such as those found in Every Child, including Young (2007) (also Kinsella, 2007; 2008). Whilst valuable to the field, these examples are not generally reported as research (Davis et al, 2005). In other words, good education for sustainability practice is just that—anecdotes that tell important stories about sustainability practices in early childhood settings, but do not necessarily offer research-informed critique and/or theoretical ways of thinking about the implementation and consequences of sustainability for early childhood settings.

- Conducting research with young children is often seen as a somewhat challenging task, both ethically and practically (Dockett, Einarsdottir & Perry, 2009; Harwood, 2010). This is especially for researchers unfamiliar with early childhood education (such as those from the environmental education field who are more likely to be working in school, university or community contexts with older children or adults). Researchers require responsive and innovative approaches to authentically engage young children in research and/or as research participants. As recently advocated by Barratt Hacking, Cutter-MacKenzie and Barratt (2013) research with and by children should be prioritised. One illustrative paper that explored such research approaches with children is described in this collection by Mackey and Vaealiki (2011).

- There appears to be a nature/sustainability conundrum within early childhood education. The strong pedagogical tradition of outdoor play in nature’ that informs early childhood education seems to have become associated with the position that simply engaging children in outdoor play in nature is sufficient to address issues of sustainability. While there is no doubt that nature play and place-based learning provides a rich foundation for education for sustainability, as Elliott and Davis (2004) and Moore (2009) emphasise in this collection (see also Chawla & Derr, 2012; Kellert,
Emerging scholarship into relationships with and human, ‘nature’ and the increasing emergence of digital technologies in young children’s lives (Taylor, Pacini-Ketchabaw, Blaise, 2012). Reflecting on why the emergence of research in early childhood education for sustainability has been rather slow, compared to that focused in some other educational domains, offers provocations for researchers to engage in this research space. For example, is it that young children are perceived as too young to learn about sustainability? Has a philosophical commitment to outdoor play within the field meant that researchers, too, have assumed that education for sustainability is adequately addressed by young children's exposure to nature? Or, has sustainability research not yet engaged with trends in early childhood post-structuralist and post-humanist research that acknowledge relationships across species and ecological systems? These questions raise issues about which theoretical frameworks, methodologies and research problems are understood as both useful and available for investigating education for sustainability in early childhood settings. These emerging issues are reflected in some of the republished articles in this edition, which are drawn for example, from a post-developmental perspective (Edwards & Cutter-Mackenzie, 2011), an ecopsychology approach (Tarr, 2008) and socio-culturally informed participatory approaches (Mackey & Vaealiki, 2011; Sandberg & Arlemalm-Hagser, 2011). In addition, critical theory, systems theory, and complexity theory have to varying degrees informed our individual research studies (Davis et al, 2005; Elliott, 2012). Furthermore, the methodologies that underpin the research reported on in this collection range from interpretivist approaches to arts-based methods and action research, so perhaps we are already seeing the beginnings of an opening up of ECEfS research possibilities. While there is still just a ‘small research base upon which to grow’ (Davis, 2010, p. 38), we believe the underlying imperative is that change towards sustainability in the early childhood field should not only be informed by research, but facilitated by theoretically-informed and methodologically-diverse research. Further research avenues such as leadership for sustainability and organisational change in early childhood services (Elliott, 2012), explorations of children's ideas about sustainability topics, or the wider impacts of early education for sustainability initiatives (Davis, 2009) are yet to be explored as research topics, while Deleuzian methodologies, for example, have yet to be used creatively in this arena. Importantly, issues related to children's experiences of technologies and the extent to which these mediate education for sustainability also offer future avenues of research in the early years. There is significant potential for current and emerging theoretical
frames and methodologies to be utilised, thus adding to the multiplicities and richness of future early childhood education for sustainability research.

**Conclusion**

The current status of early childhood education for sustainability is a consequence of ‘20 years of advocacy by a small band of individuals and their networks’ (Davis, 2010, p. 26). As key members of this small band, it is rewarding to be able to look back on the changes over the years and to now be in a position to reflect that our personal journeys have increasingly become shared journeys with a growing group of practitioners and researchers in early childhood education for sustainability. This themed publication suggests that we do, indeed, have something important to celebrate as education for sustainability in early childhood has definitely moved from the margins to the mainstream. What the next twenty years of research will offer in forms of understanding education for sustainability in early childhood education in theoretical, philosophical and research terms is a journey which we look forward to within the early childhood education community; we can only imagine what might be achieved in the next twenty years of this journey.

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We are all aware of the active curiosity which young children demonstrate through the seemingly interminable number of questions which they ask. Usually, these questions relate to the natural phenomena which occur around them every day, although sometimes the questions refer to things far removed from the child’s every day experience. However, for the purposes of this paper, we will be considering those things which are likely to occur within the child’s immediate surroundings; that is, the child’s environment.

The natural phenomena which are the objects of the child’s curiosity are frequently classified as belonging to an area of study which we label Science. Hence, when children are asking you (the teacher and/or parent) questions about phenomena within their environment, they are beginning a study of Environmental Science. At this beginning level, I would define Environmental Science as being ‘an active exploration of the natural environment, a way of developing an awareness and understanding of the relationships that exist within it, and, above all, a recognition that we are responsible for its welfare’ (Walsh, 1982).

In considering learning programs which take account of this definition we need to consider:

(a) how children might be involved in active inquiry and
(b) how we might begin to help them understand their environment by considering carefully how we respond to their questions and how we might ask some of our own.

The response to task (a) is not too difficult. Children can be involved in active inquiry if we expose them to firsthand experience with materials. To allow children to interact with materials will allow them to develop their own, personal patterns of knowledge and will allow the subsequent inquiry to be initiated by the child i.e. it will be child-centred. Some children will gain more information than others, but all children will gain different information and impressions of the materials. However, simply exposing them to materials or to different environments is not enough, and, unfortunately, educators often do not go beyond merely exposing children to materials or taking them to new or different environments.

The effect that the process of active inquiry has upon a child depends to a large extent on how the teacher/parent responds to the assistance which a child will seek. This leads to task (b).

The response by the teacher to the excited and active exploration by children of phenomena in their environment will determine whether their curiosity continues, develops or actually becomes deflated. Most teachers feel the excitement of a ‘new’ discovery or a particularly penetrating question on the part of a child, but are unsure about how they might use this discovery or where a particular
investigation or topic might lead. Unfortunately, if the teacher lacks a knowledge base which assists the child to inquire further, then that child will become less likely to share any further discoveries with the teacher and may soon stop the investigative activity altogether. This event will certainly occur if the teacher shows a fearful or less than enthusiastic response to the excited discoveries or questions from a child.

What importance should be attached to the knowledge base mentioned earlier? Knowledge is what teaching is about. ‘No amount of general intellectual skill or mastery over cognitive strategies will overcome lacks in content knowledge’ (Shulman, 1974). Teachers are not able to help children develop observational skills and begin to recognise similarities and differences unless they are confident of their own knowledge in the topic area. Many teachers with little background in science education make the attempt to include science in their curriculum but the work which results is superficial, even at elementary science level.

Very young children can be stimulated to ask the sort of questions which can lead to the formulation of hypotheses and the devising of experiments to test them, but this will not happen unless the teacher is knowledgeable, confident and enthusiastic about the topic.

I am not suggesting that every teacher needs to be a walking encyclopedia of knowledge ready to respond unhesitatingly to questions by giving authoritative answers every time, but the assumption that teachers don’t have to ‘know’ much science in order to teach it to young children is absurd. The movement away from content in teaching appears to have increased in recent times (Buchmann, 1982) and not only in the area of science teaching. Many teachers are today expected to demonstrate expertise in a wide range of subject areas—the result in most cases can only be a superficial treatment of the unfamiliar area, and a devaluing of its importance or worth through the lower level of enthusiasm exhibited by teachers for this unfamiliar area.

An example may help to illustrate my concern

Imagine a class of children who have been taken to a rocky shore (including a sandy beach) for an excursion. The teacher has given the children an opportunity to explore within a certain area along the beach and amongst the rocks. Imagine the busily searching child who has been locating lots of crabs under lots of rocks and who finds a crab carrying eggs beneath its body. The child is especially excited by this discovery and brings this find to the teacher. How does the teacher react? There is one category of teacher who knows nothing at all about crabs and possesses a feeling best described as revulsion at their spider-like appearance. This teacher would have very great difficulty in steering a course of questions in an appropriate direction, in fact, this teacher probably should not have attempted the excursion at all, especially if it was realised that the children would inevitably locate ‘creepy, crawly’ animals.

Imagine another teacher who knows nothing about crabs but is not ‘frightened’ by them. This teacher will welcome the child’s excitement and try to use it. The dialogue will probably emphasise the processes of science, such as ‘Have you seen any others like this?’ or ‘How many eggs do you think there are?’ or ‘Do you think it is a mother (female) crab?’ etc. The child will not be given many ‘answers’ to the questions asked, merely lots more questions.

Contrast both these teacher ‘categories’ with another teacher who has researched as much relevant knowledge as possible about the living and non-living things likely to be found on this beach. This teacher knows that there are male and female crabs, and that female crabs carry eggs. This teacher knows about breeding seasons, life cycles, habitats, feeding habits of crabs, ways of identifying them, etc. You can readily imagine the dialogue that might occur on the rocky beach between this enthusiastic teacher and the child. The dialogue is likely to be much richer when the teacher possesses a reasonable level of knowledge about the sorts of things likely to be found on the beach. Such a teacher can ‘see’ the situations where meaningful science experiences can be organised from chance occurrences, and can ask the right questions.

No amount of general intellectual skill or mastery over cognitive strategies will overcome lacks in content knowledge.
The sort of knowledge likely to be useful to the teacher whilst on the beach excursion has been anticipated, and this knowledge can be interpreted into a meaningful form for the children. But, how do teachers become more knowledgeable in science if they have not had the benefit of a background of study in science? Nobody can expect to carry around all of the answers to questions children ask, but it is remarkable how much more confidence is shown by teachers who have been through an extended in-service or preservice science course which emphasises an in-depth study of a specific area in science rather than a general course about science.

Nobody can expect to carry around all of the answers to questions children ask.

My impressions are partly based on experiences gained by offering in-service courses in ‘Environmental Science’ to persons with very limited backgrounds in science. In a three-week (8 hour) period during which the topic of Invertebrates was covered; these persons became remarkably knowledgeable about the animals they were likely to discover in their local situation. They were shown that simple reference books are readily available and that knowledge about these animals can be quickly and easily assimilated provided the basic background has been provided. (In this example, the 8 hours was devoted to a basic background in classification keys, terminology and observation of living and preserved specimens). This was sufficient background to give enough confidence to the teachers to stimulate them to obtain sufficient information (knowledge) to engage in a meaningful dialogue with young children regarding invertebrates. The principle extends to other topics as well, with an in-service course in ‘Science in Toys’ also proving to be worthwhile.

Implementing an Environmental Science Program

Since children, especially very young children, are interested in natural phenomena, then we should encourage their learning by starting with such an area of interest.

Unfortunately, as mentioned earlier, an inadequate education in science often deters teachers from using the natural environment as a starting-point. I believe an approach such as the following should be tried by any educator wishing to include more science in his/her program.

Some additional advice

1. Choose an area for study. It may be in the school ground or nearby, or it may be a bus-ride away. The area chosen must be rich in flora and/or fauna and/or phenomena likely to appeal to children (rocks, tides, etc.).

2. Spend time investigating the site prior to taking children to it. Make a comprehensive list of the things you find or phenomena that you encounter which you anticipate might provoke questions. This activity is most important, and will be very time-consuming at first, but your skill at evaluating a site will improve with practice.

3. Research as much information as you can about each of the things on your list. You will be surprised by the ease with which you can collect information once you start your systematic search. Use librarians for help. Secondary science teachers at your nearest high school should also be approached. They will be flattered by your request, and generally will find out answers for you if they don’t know them at first. Once you have built up a knowledge bank for one area, you will find that subsequent investigation for other topics becomes easier as you learn to divide concepts into sub-concepts.

4. Take your children to the site. With your carefully researched knowledge base, you will be much more confident to lead the children in their active inquiry. Don’t try and set yourself up as an expert, but look upon your well-briefed background as an aid to help you to ask the right questions.

5. Take careful note of the activities which most interest the children and the phenomena which stimulated the most questions. Fill in any gaps in your knowledge which were revealed by the children. You are now in a very strong position for the repeat of the activity next time.

6. Keep comprehensive notes of your findings, observations and evaluations. You will have expended a lot of time and energy, and you won’t want to misplace the information you have collected.
7. Make use of any teachers in your school who have a background of study in science. If you hold an administrative post, deploy these teachers so that their expertise can be used to the full, even if it means classifying them as specialist teachers.

8. Enrol for in-service courses, particularly courses which are designed to increase knowledge about science.

9. Start slowly. Do not try to do too much too quickly.

10. Develop an inquiring mind. Practise asking questions about everything you see around you, the sort of questions that your children ask and that you would have asked when you were five years old. But, try and find answers to your questions, don’t just leave them ‘dangling’.

Finally, we all know that science is neglected in the early childhood years, and yet science represents the major focus of ALL children’s interests at this age. The main requirement is to engage and retain this interest and motivation, and science is a very appropriate instrument for this purpose.

A key element in studies of the natural environment involves the recognition that we are responsible for its welfare. Concern for the consequences of damage to the environment follows when children understand that there are intricate relationships which can be very easily disturbed. Teachers can help children in their understanding if they themselves are aware, enthusiastic and informed. Enrolment in an in-service course or an intensive course of self-instruction could be appropriate for teachers to achieve these ends.

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References


Mudpies and daisy chains:
Connecting young children and nature


Can you remember?

Can you remember making mud pies and daisy chains, rolling down grassy hills, drawing with sticks in the dirt, creating fairy perfumes from flowers and building bush cubbies?

These are some of the experiences we had as children that connected us with the natural environment. While they may not be part of our conscious thought as adults, they are significant none the less in shaping who we are and our values about the natural environment. Chawla (1990, p. 18) poetically describes these experiences as ‘radioactive jewels buried within us, emitting energy across the years of our life’. Sebba (1991, p. 395) suggests that the natural landscapes of childhood become the inner landscapes of adulthood. What we explored as children in the natural environment is carried within us throughout life.

If experiences with the natural environment are of such great import in our lives, we must question where these experiences are in the lives of children today. Every Australian early childhood educator has observed the increasing busyness of children’s lives and an orientation away from nature towards the latest toy, electronic gadget or tantalising entertainment. According to Brown (2004), such a focus on technology is not merely an orientation, but an addiction pervading all levels of communities. Children are most vulnerable to this addiction, but at the same time, have an undeniable affinity with nature. If as Thomas and Thompson (2004, p. 4) claim, ‘children’s ability to experience the natural environment is under threat’ and ‘children’s access to outdoor play has evaporated like water in sunshine’ (Rivkin, 1995 p. 2), what does the future hold?

In light of these statements, can we still just smile when children naively say ‘milk comes from milk bars’ and ‘peas come from the supermarket freezer’? A smile is no longer an appropriate response if sustainability is to be achieved.
Both children and adults need to understand that our survival is directly linked to the plants and animals around us and not shops. Early childhood educators have an active and significant role to play ensuring children experience connections with the natural environment in meaningful ways—ways that will assist their understanding of connectedness both with and in the natural environment, and ultimately, promote action for sustainability.

A biological connection

The earth’s human population is increasing exponentially, and humans—as a species—have broken all the biological rules that normally keep populations and species in check. We have been able to do this largely due to our reliance on the energy stored in fossil fuels formed over many millions of years (The Age, 11 August, 2004). Each time we turn on a light or drive a car, this connection is realised. Understanding this connection between humans as a species, and the earth that supports our existence, is fundamental and not to be ignored even in early childhood.

The biological connection between humans and the natural environment is described by E. O. Wilson’s biophilia hypothesis (cited in Rivkin, 1995). He suggests that humans have evolved in the natural environment for many thousands of years and therefore, our connections with the natural environment are innate. It has even been suggested that our connections with water are hard wired into our genetic makeup (Deakin University and Parks Victoria, 2002) as a survival mechanism from our hunter-gatherer days. Any early childhood educator who has observed young children spending hours playing with water will attest to this possibility. "E. O. Wilson and others suggest that since we evolved in natural environments, technology cannot replace but only atrophy the development of our links to nature. If this is the case, children reared apart from nature are necessarily limited" (cited in Rivkin, 1995, p. 6). Early childhood educators have an opportunity to capitalise on these innate connections and build strong foundations for sustainability.

Early Childhood: A window of opportunity

In early childhood, there is a window of opportunity to facilitate the connections with the natural environment that will last a life time. To ignore this window is to risk ‘gene rational amnesia’ as described by Kahn and Kellert (2003). They propose that with each successive generation, we become more removed from the natural environment.

No doubt some of the children in our child care centres, kindergartens and preschools have never been outside a city, negotiated a bumpy bush track or listened to the sound of water cascading over river rocks. Will they ever have these experiences or will they undergo generational amnesia? These experiences cannot be described verbally or portrayed by images in picture storybooks or on television and computer screens; they must be explored up close and personal! One can only hope that the classic Leunig cartoon of the 70s does not become a reality.

Direct experiences with the natural elements is only part of the story. No doubt some of the children in our child care centres, kindergartens and preschools have never been outside a city, negotiated a bumpy bush track or listened to the sound of water cascading over river rocks. Will they ever have these experiences or will they undergo generational amnesia? These experiences cannot be described verbally or portrayed by images in picture storybooks or on television and computer screens; they must be explored up close and personal! One can only hope that the classic Leunig cartoon of the 70s does not become a reality.

Direct experiences with the natural environment are also important for sensory development. It is not beyond the realms of possibility for a baby to experience little more than human-made synthetics from nappies to bottles, toys, pacifiers and pushers. The catch phrase ‘babies need books’ could be replaced with ‘babies need grass’! Sebba (1991) extends this notion beyond babyhood suggesting that a process of sensory integration occurs until 10 years of age. How can one be expected to care for, or protect, the natural environment if one has never been immersed in it?

In Scandinavia, children attending nature nursery schools experience a complete immersion in the forest as their outdoor playspace. Adhemar (2000, p. 44) questions: ‘What better way could there be to learn about animals, plants and the changing of the seasons? What more effective way to teach children about basic ecological concerns, when they arise so spontaneously and in such a genuine context?’ In Australia, some early childhood centres have recognised the importance of nature for children and created nature-based outdoor playspaces. Such playspaces usually include significant plantings, diverse and natural ground surfaces, flexible equipment and special features such as trickle streams, bush cubbies, vegetable gardens and butterfly houses. These playspaces become a sea of natural sensory stimuli for children. Early childhood educators need to be aware that the potential for sensory experience lies beyond the specific play experiences we set up, and should include the whole outdoor setting.
Direct experience with natural elements is only part of the story. Chawla (1990) researched the significant life experiences that had guided environmentally-active adults and found that significant adults were a primary influence. Such adults are those who model, mentor, share and interpret with children their positive connections with the natural environment. The most inspiring essay about this crucial role of adults is The sense of wonder written in 1956 by Rachel Carson. She summarises: ‘If a child is to keep alive his inborn sense of wonder ... he needs the companionship of at least one adult who can share it, rediscovering with him the joy, excitement and mystery of the world we live in’ (Carson, 1998, first published 1956, p. 55). Her essay has not dated and is more pertinent now than ever before.

This article does not provide a recipe for how to promote connections with the natural environment in early childhood services, but a rationale. With this rationale in mind, we invite early childhood educators to make mud pies and daisy chains with children for a sustainable future.

Sue Elliott and Julie Davis

Elliott and Davis are also the authors of Early childhood environmental education: Making it mainstream. Published in 2003, this book is available from Early Childhood Australia.

References
‘Only children can make secret places’:

Children’s secret places in early childhood settings


For me, childhood has always been fundamentally linked with being outside. Countless hours of my childhood were spent playing outside in carefully constructed cubbies, creek beds and the undergrowth of the surrounding bush. I can vividly remember the strong sense of attachment to the special places I called my own. My mother often said the only reason I became a kindergarten teacher was so I could legitimately play in mud as an adult. She was probably right, as my early childhood experiences have had a significant impact on my teaching values and opinions of the best outdoor environments for children.
In my recent postgraduate research on the outdoor playspaces children want in early childhood settings, I discovered that ‘places’ mattered intensely to children. It was the strongest theme that emerged from the data, especially when I really listened to what the children were saying.

When John spoke with such authority of his ‘bamboo jungle’ being a secret place, and not just a special place, a whole new tangent of discovery opened up. My line of enquiry swiftly changed from asking about ‘favourite things in the playground’ to ‘Do you have a secret place outside?’ I could see on the children’s faces that I was now tapping into ‘secret children’s business’ (Giugni, 2006).

I was fascinated to hear from the children that only they can make secret places; yet they were aware that adults needed to provide bits and pieces to allow the children to make these places, such as plants, bark, twigs and spades. Alice was very clear in saying:

‘Special places are for everyone [such as an adult-made flying fox], but a secret place is just for me [such as her own space behind a particular plant]’

Perhaps most revealing was John’s comment about the adult role in providing the ‘illusion of seclusion’ (Elliott, 2008) for children’s hiding places:

‘I hide in a safe place. I hide down in the jungle. This is a secret place … the teacher doesn’t know about it, but she knows where we are.’

The children in my study said that they needed to hide away from adults in their own ‘constructed places’, reinforcing Nabhan and Trimble’s (1994) theory (cited in Young, 2008, p. 46) that children have ‘an intrinsic need to create cubbies and concealed areas, removed from adults’. Many other classical studies and current literature (for example, Hart, 1979; Sobel, 2002) state that children create secret places to have somewhere that is ‘a child’s domain of personal power’ (Sturm, 2008, p. 47); somewhere they can retreat to in order to feel ‘enclosed’ in a safe place; and a place to hide where they can make sense of the world around them.

The overwhelming evidence from the children in my case study was that they needed and wanted multiple opportunities to create their own secret spaces. In constructing these secret places, children are consequently able to practice the problem-solving skills involved in ‘meaningful work’, develop feelings of empowerment over their own spaces; and complete their own choice of projects through sustained, engaged and imaginative play.

I especially agree with Wilson (1997) who believes that early childhood educators need to ‘respect the secretness’ of children’s special places by avoiding obvious and ‘intrusive over-monitoring’ of children’s spaces. She suggests that we need to find ways to provide places with ‘nest-like vegetation’ for children’s ‘retreat and quiet spaces’ (p. 192).

There are many approaches available to early childhood practitioners, in any setting, to enable children to meet this intense need to create their own secret places. The key strategy is to provide a range of child-sized enclosed spaces together with a variety of loose provisions for children to choose from to allow a sense of ownership in their ‘place’ constructions.

These enclosed spaces can be as simple as providing groups of potted plants or as complex as planting a series of ‘garden rooms’. For example, three to five small deciduous trees such as Silver Birches or Silver Princess Eucalyptus can be planted to make a circle of trees; clumps of Golden Diosma scattered naturally in a corner of the playground; or a thicket of a few indigenous Chef’s Cap Correas planted among large, flat rocks. A weeping ornamental Cherry Blossom tree can provide a wonderful secret space for children who will find its low-hanging branches irresistible. Pots of low-growing plants such as daisies or annual flowers can be arranged to create a ‘central space’, with some pot plants light enough for the children to rearrange themselves with trolleys to make their own ‘habitats for children’ (Wilson, 1997).
I was fascinated to hear from the children that only they can make secret places ...

Herbaceous sensory gardens can be planted in even the smallest sunny space, with soft rose geranium leaves, pineapple sage and rosemary herbs to create quiet reflective spaces. Native strappy-leafed Lomandra can be grown in clumps around an area where children can bring in other loose materials to further their secret space constructions. This idea could be extended into the use of large branches arranged to make ‘stick bush cubbies’ in an assortment of shapes and sizes—initially with some minimal adult assistance for safety considerations.

Secret places are important to children. Although adults may not always accurately predict where children will want to claim their secret places, it is our responsibility to provide opportunities for children to choose their own ‘places’ by making some of these provisions available and accessible within early childhood settings. This will allow each child the freedom to create their own ‘sense of place’ within their individually constructed and essential secret places.

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References

*Please note: Pseudonym names used for children in study.
Enhancing environmental awareness through the arts


This paper reports on a recent action research project, Enhancing environmental awareness through the arts. This project involved working with two early childhood professionals and 28 children in a long day care centre in the Sydney CBD at the end of 2006. Its aim was to assess the outcomes for the early childhood professionals, and for the children they worked with, of using arts-based pedagogies for enhancing environmental awareness. As the children in this centre had considerable indoor space but no outdoor space at all, the participating staff in the two–three-year-olds’ room were interested in how this project could help to incorporate the natural environment into their programs. This paper outlines the theory that underpins the research, the processes involved in developing and conducting it, and the findings. The findings show that the arts-based pedagogies applied throughout the project had a definite effect on the children’s awareness of the natural environment (also referred to as the ‘natural world’ throughout this paper). This was demonstrated through how much the children talked about the natural environment, the way they incorporated concepts about it into their play and their attitudes toward it. The findings also show that the action research approach used throughout the project resulted in the two early childhood professionals developing new techniques for creating meaningful content for the program. This report also considers the questions that arose as a result of the research and suggests how they could be further explored.
**Background**

Young children’s perceptions of the natural world and their engagement with it (or lack thereof) are emerging areas of research in the early childhood field. Cutter-Mackenzie and Edwards (2006) highlight the relevance of the environment becoming deliberate content in early childhood settings, given that it has become such a prominent aspect of our social and cultural lives. This is consistent with the increasing concern about the effects of past and present environmental mismanagement and the enhanced understanding of the importance of the relationship human beings have with the natural world (Louv, 2006; Phenice & Griffore, 2003; Roszak, 1992; World Wildlife Fund, 2006). Much of this literature, particularly that related to children and education, is based on the premise that children need to become environmentally aware citizens in order to understand and constructively manage the environment, both as a resource and for future generations. While this may be so, what is not often considered is the daunting responsibility this imposes upon them. The Australian Government document, *Educating for a sustainable future: A national environmental education statement for Australian schools* (2005), advocates the stewardship role as the fundamental purpose of environmental education. The document also contains statements that reflect the aesthetic value of the land and the cultural significance of tracts of land (particularly those identified as significant by Indigenous peoples). On page 2 of *Educating for a sustainable future* (2005), the emphasis on stewardship is further highlighted by including a quotation from the United Nations Decade of Education for Sustainable Development project. The purpose of including this quotation appears to be to describe the nature of the Australian document and the purpose of environmental education:

> There can be few more pressing and critical goals for the future of humankind than to ensure steady improvement in the quality of life for this and future generations, in a way that respects our common heritage—the planet we live on ... Education for sustainable development is a life-wide and lifelong endeavour which challenges individuals, institutions and societies to view tomorrow as a day that belongs to all of us, or it will not belong to anyone. (UNESCO, p. 9).

The message that ‘we are doomed if we don’t’ is quite clear, although it is also evident that there are many aspects of environmental education necessary for children to develop an appreciation of how they are to live. However, the limited scope children have as agents of change in this field—and the sheer weight of the responsibility the current educational focus places on them to repair the damage already done and to develop new ways of living—may hinder them in doing so.

The view of the natural environment taken by this research project differs from the utilitarian premise that often sees nature as a resource that needs to be managed for mankind’s use (Macy & Brown, 1998, 2000). This research sought to examine the effects of enhancing children’s understanding of the natural world through the arts in an optimistic, creative manner, without a subtext of remediation or responsibility for management of the environment into the future. This approach is supported by Macy (1983, 2000), who highlights the impossibility of constructively knowing or acting in concert with the environment when one is in a state of overt concern or despair about it. This concern, while justifying the need for environmental education, risks leaving participants in a state of environmental helplessness or denial (Cohen, 2000; Macy, 1983; Macy & Brown, 1998). In contrast, the approach taken throughout this research was to help the children to understand and develop a positive connection with the natural world, particularly in their local area.

**Connection with the natural world**

The premise that having a sense of connection with the natural world is a constructive condition is supported by old and new educational and psychological theory. Dewey (1926, 1930) describes a connection with the natural world as being a primary source of experience and cognitive development. He relates the ability to apprehend the qualities of natural phenomena and matter to the development of thinking processes, primary cognition and a sense of place. The qualities of a given phenomenon include sound, texture, colour, movement, smell and proportion. They are all apprehended through sensory impressions. This is directly relevant to the artistic approach this research used, as exploration of natural phenomena through the arts involves developing an understanding of the subject through the senses, the emotions and thought. A more contemporary expression of this is discussed by Phenice and Griffore (2003), Roszack (1992), Ingunn (2004) and Capra (2002), who discuss the notions of the ecopsychological self and ecoliteracy.
Children express and refine their understanding of their experiences in the world through play, and this includes playing with or exploring artistic media.

There were no children present during these workshops. In between workshops, the early childhood professionals incorporated their newly developed self-generated creative environmental content into their daily program with the 28 children in their group. At each subsequent workshop with the researcher they reported on the success of the implementation of the new content in their program and worked together to build on those successes and to explore additional arts-based techniques.

The early childhood professionals were encouraged to incorporate the natural world in a manner that highlighted inherent biological or physiological connections and interrelationships (e.g., photosynthesis, the water cycle, soil nutrients for plant growth), the animals and their habitats, animal social dynamics and the interdependence of flora and fauna. They also sought to build on the children’s current understandings of the natural world, including any misconceptions they may have, and to highlight flora and fauna in the local area. The content included was not based on any specific environmental curriculum or hierarchy of concepts. The vehicle used to incorporate these concepts was directly related to the modes of experience and activity children are encouraged and seen to naturally engage in—that is, visual and dramatic arts and play (A’Beckett, 1991; Catron & Allen, 1999; Dockett & Fleer, 1999; Kolbe, 2001; Kolbe, 2005).

Teaching about the environment through the arts

The early childhood professionals participating in this research presented concepts about the natural world to the children through songs, stories, verses and visual and dramatic art experiences they created. They based the content of these creative artefacts on the natural world, maintaining the integrity of the subject at all times. However, they did this with reference to the children’s current levels of understanding and interest, which were determined through discussions with, and observations of, the children. This was considered essential so that the material presented was meaningful and accessible (Davis & Elliott, 2003; Palmer, 1994; Wals, 1994). The capacity of the early childhood professionals to create and deliver this content, and observe its effect, was supported through an action learning process. The inherent cycles of investigation (exploring new ways of representing the natural world), application (using new content and pedagogical techniques in the classroom) and reflection

Implementation

This research was aimed at understanding the extent to which the early childhood professionals felt that arts-based pedagogy could help children to engage with concepts and develop understandings of the natural world. The researcher met with two early childhood professionals (who worked together in the same room) for five two-hour workshops over a two-month period. During these workshops, with the assistance of the researcher, the early childhood professionals explored techniques for using the arts (storytelling, movement, music, painting, drawing and handwork) to incorporate concepts and representations of the natural world into their programs.

They talk about an inherent connectedness to the natural world that helps to shape our identity through an innate ‘biophilia or affiliation with other living organisms’ (Clinebell, cited in Phenice and Griffore, 2003, p. 167).

Another key relationship between the natural world, the arts and children’s comprehension is that of play. Through play children build cognitive schema, explore their understandings, question concepts and test theory (Berk & Winsler, 1995; Vygotsky, 1978). They respond instinctively to sensory impressions and express their experiences of them in play. They develop a sense of social dynamics and an understanding of what is or is not appropriate behaviour in a given setting (Dockett & Fleer, 1999; Hamilton & McFarlane, 2005). Children express and refine their understandings of their experiences in the world through play, and this includes playing with or exploring artistic media (Kolbe, 2001, 2005). With this in mind, play becomes a key measure through which their understandings can be observed.
Recruitment

The process outlined above clearly positioned the early childhood professionals as the key instruments for implementing the research, adapting it where they felt it necessary. This level of involvement necessitated the participants' interest and willingness (Henderson-Kelly & Pamphilon, 2000; Rodd, 1997; Shoemaker, 2000). Initially it was thought that participants were more likely to be recruited by pursuing professional connections where there were related interests (Graue & Hawkins, 2005), i.e. environmental education in early childhood. However, the centre that participated was not part of a network, nor did it have a particular focus on environmental education, but was referred by a key organisation in the early childhood field. The early childhood professionals were interested because of their own commitment to professional development. They also felt it was particularly relevant research for them as their centre had no outdoor space and limited scope for expressing the environment in their programs.

Overview of content in the meetings/workshops

There were five evening workshops over a two-month period, each consisting of discussion and workshop content. The initial meeting included the researcher outlining the research project and process and a workshop on storytelling. Subsequent meetings/workshops consisted of the early childhood professionals discussing and/or reflecting on their experiences of implementing the research with the children, and workshops to explore additional creative mediums for doing so.

Storytelling, the focus of the first workshop, was a useful starting point as storytelling provides unlimited scope to introduce concepts about the natural world that are accurate, contextual and creative (Capra, 2002; Curtis, 2007). This meeting emphasised the importance of research by the storyteller to ensure that the subjects chosen were accurately and contextually represented. Discussion focused on researching and representing all manner of natural phenomena, flora and fauna, and included topics such as photosynthesis, rainbows or the water cycle, and ways of characterising plant growth, animals and their social dynamics. The phenomena, flora and fauna the early childhood professionals chose to research and ultimately represent in their stories were based on their knowledge of the children's interests and/or current understandings.

Once the stories were being implemented as part of the regular program, the early childhood professionals gathered and recorded information about the children's play and interactions, and samples of their creative work. They also recorded relevant aspects of their conversations with the children and their parents. This type of record-keeping was part of their normal practice and, in this context, helped to show the extent to which new content about aspects of the natural world was being incorporated into the children's understandings. These records were brought to the next and to each subsequent workshop for discussion. The researcher assumed the role of facilitator, supporting the participants in sharing their reflections about the effects of the stories, and in deciding which topics or characters to extend through stories or through other creative mediums such as drawing, painting, sculpture, song, verse or movement. These were, in turn, the focus of the workshops.
Data

In childcare settings, early childhood professionals use a variety of record-keeping methods. They include diary and journal entries, anecdotes and learning stories (Carr, 2000), formal written observations and audio/visual records, work samples from the children, and records of conversation with the children or their family members (Arthur et al., 2008; Puckett & Black, 2000). As all of these methods are valid forms of recording data (Arthur et al., 2008), the research project did not prescribe the methods the early childhood professionals used; rather, it incorporated their current practices.

Another form of empirical data was generated through a brief questionnaire. The early childhood professionals were asked about their familiarity with the natural environment, the methods they used to convey information on this topic to children, and the ways the children reflected their understandings of the environment. This schedule of questions was used on two occasions throughout the research period and was used to compare and contrast the changes in attitude to and awareness of the environment, and the development of new skills by the early childhood professionals.

Data was discussed and analysed at each workshop and at the final meeting. During this meeting the early childhood professionals were asked to summarise the key outcomes from each workshop—the content, the extent to which they found the subject matter and techniques appropriate for use in their programs, how techniques and content were adapted, the benefits for themselves as professionals, and what they felt the outcomes were for the children. Throughout the discussion, they referred to the items in the journal they had created to document the project. This contained formal observations, learning stories, photographs and anecdotes about the children’s experiences, and work samples from the children.

Outcomes

Each of the meeting/workshop sessions focused on specific mediums for presenting information about the natural world. The following section discusses each workshop in sequence.

Storytelling

The first workshop focused on storytelling. The researcher led a discussion on methods for finding out about the children’s current interests or understandings of the natural world, as a starting point for creating stories. Factually and creatively representing natural phenomena, flora and fauna, and notions of narrative, plot, characters and settings were also discussed. Identifying the qualities of plants and animals was discussed and included elements such as growth cycles or gestation, colours, habitats, movement, sounds and textures. The workshop also focused on ways to weave these attributes into stories.

Each of the meeting/workshop sessions focused on specific mediums for presenting information about the natural world.

The early childhood professionals also used props for telling their stories or representing the characters. These items often became part of displays or items for play afterwards. The props included puppets, bark, shells, leaves and twigs, polished and rough stones, and coloured silk scarves for rivers, grassed areas or sunshine. Some of the characters created as key players for the stories were Charlie Kookaburra, Frog, Fred Koala and his family, Clickity Crab, Little Lady Beetle, Salty Seaweed and Hoppy Kangaroo. The early childhood professionals also used reference books to explore the characters with the children, and took over the director’s office on several occasions to extend their exploration on the internet. For example, they looked up the movement of whales migrating along the east coast of Australia and the habitat of Clickity Crab (a hermit crab).

The children quickly engaged with these characters and asked for more stories about them. The second workshop discussed which animals or natural features interested the children and why this might be so. It examined the content of the stories, the way the children identified with the action in the stories and/or the fate of the characters. The early childhood professionals concluded that the stories, particularly those about groups of animals, were a model of social cooperation. This was not so much the intention of the storytellers but perhaps an outcome of faithfully
representing the animals’ (in this case, story characters’) social groupings. The symbiotic relationships and/or the story characters’ attributes were also qualities the children could identify with.

The story medium was one that the early childhood professionals found developed a life of its own as they created stories that built on each other and reflected the degree of the children’s interest in the characters. They found this process gave them additional insight into the children’s interests and personalities. Most notably, they found that aspects of the children’s behaviour, both individually and as a group, changed as a result of the stories. One of the early childhood professionals said:

The group were quiet and thoroughly engaged—they’re quiet and interested—with none of the normal jostling for position or asking each other to move so they could see the page.

The children also began to reflect the story characters and their qualities in their play. They played at telling stories to each other and talked about the different environments:

It was so hot and blowy on the beach it stunged my face (Child, two years five months, talking to another child).

They talked about the characters, their habitats and how they needed to be treated:

…and you have to be careful because the egg is going to hatch soon and it needs looking after. (Child, two years, four months, being the storyteller to a small group of children).

In home corner and during other games, it was often observed that it was ‘raining’ or ‘windy’. These expressions were particularly apparent after weekends when the children had been outdoors with their families. The items the children brought from home began to change and included leaves, a ladybug and a piece of bark, and on one occasion a snail as a gift for the director. The early childhood professionals concluded that the stories, as well as providing a wealth of factual information about the characters and their habitats, were useful as a tool for supporting the social dynamics of the group and providing behavioural models for the children. They said they tell stories every day now and ‘hardly read the books any more’. They went on to say, ‘We’ll never stop telling stories.’ While the aim of the research was not to limit the number of books read to the children, the comments from the early childhood professionals highlight their enthusiasm for creating and telling stories of this nature.

**Movement and music**

The stories provided the content for the activities conducted in the other workshops. The second session focused on movement, music and verse. It provided examples of how one can extend on a given character by exploring its rhythms, sounds and movement dynamics, and how these might give rise to auditory and movement-based experiences. These qualities were based in fact but interpreted artistically. For example, how does the wind move when in the form of a gentle breeze compared to a blowing gale? What movement dynamics, sounds and melodies could accompany this? The characters in the stories were the focus of this session, which looked at the ways they might be expressed in songs, verses and movement.

The early childhood professionals said music and movement were the areas where they were most out of their comfort zone. During the final assessment (meeting five) they initially said they hadn’t really used these techniques much because of time constraints and/or lack of confidence. However, after further questioning, it emerged that they did in fact use movement experiences with the children each day during transitions between group activities. For example, they used the flight of the soaring eagle to switch to a quiet activity, and the rapid, more erratic flight of the butterfly to segue into a busy activity.

The creation of songs and verses was not an activity the early childhood professionals engaged in following the two-hour workshop covering movement, music and verse. Unless one is already skilled in or has a natural predisposition towards these areas of activity, it is unlikely that they will be taken up with any confidence, and the workshop participants did not find it easy to do so. They were surprised, however, when it was pointed out that, while using movement based on that of animals was a new practice for them, they had shown a degree of confidence in incorporating it into their sessions with children. It appears that they had thought only of what more they could do, and were not doing, when it came to their own assessment of their proficiency in this area.

**Visual arts**

The third workshop focused on how the visual arts could be used to reflect and/or express elements of nature such as growth or form, and how to interpret the natural world through colour and composition. The concentration was on painting and drawing, with sculpture being a minor
area of focus. When painting (watercolour on wet paper), the emphasis was on colour representing the qualities of the characters or environment. For example, an egg in a nest might simply be a roughly oval area of red in the middle of yellow (sunrays) surrounded by tranquil blue. These techniques were practised during the workshop. The early childhood professionals then incorporated painting into their storytelling, with the intention that the children would explore this medium for themselves. One storyteller/artist later reported that the fluid nature of the movement of colour in a particular painting frustrated one child, who wanted to see a more definite representation of Clickity Crab. So, more colour had to be added quickly as the story proceeded. The storyteller/artist said the children ‘all enjoyed this and have been asking to do it themselves since’. This is something the early childhood professionals intended to explore further.

Drawing (using wide block crayons for dramatic effect and ease of grip) focused on colour, form and process. For example, when telling stories about a seed growing into a tree, the early childhood professionals drew the earth, the sky and the sun, the seed in the earth, the roots coming down from the seed into the earth, and the shoots moving up through the earth and developing into a tree with branches. They then added leaves. The children appeared to embrace this experience, drawing their own pictures while telling the early childhood professionals, and the other children, stories about the characters or processes they were representing. It was correctly predicted that the children would continue to draw their stories in this way. The children also appeared to be using this medium to demonstrate to their peers what they knew about their favourite characters and their environments.

**Handwork**

The final practical workshop focused on handwork and was conducted two weeks before the final assessment of the whole project in mid-November. The workshop looked at how the content of stories could provide the children with opportunities for creativity through handwork or craft, thus enhancing their fine motor and coordination skills. Ideas for creating representations of the story characters through a variety of mediums were explored. They included a ‘Clickity Crab’ made from a seashell and beeswax (for the legs, head and pincers); a ‘Fred the Koala’ made from woolen pom-poms; and nests with eggs made from twigs and beeswax. The materials explored were natural, providing an experience of texture and form, consistent with the aims of the research. Although there was limited time to implement these ideas before the final analysis of the project, one of the early childhood professionals made a ‘Clickity Crab’ during a story session, and there are now many crab relatives made by the children. Over the two-month research period the early childhood professionals also developed a range of environments made from natural materials. They used coloured materials for defining areas, natural seedpods, shells, bark, stones and branches. These areas depicted the settings for their stories, and later became play areas where the children continued exploring the characters by manipulating the environment according to their interpretation of it (Hauser-Cram, 1998).

**Responses to the questionnaire**

The early childhood professionals’ answers to the questions asked at the beginning and end of the research reveal interesting changes in understanding and attitude toward the natural world and its place in the early childhood program. When asked why it was important for young children to develop an understanding of the natural world, the answers were initially focused on protecting the environment for others. The answers towards the end of the program were more aimed at understanding the environment and how things grow and live. When first asked about the role that childcare environments can play in supporting children’s understandings of the natural world, one early childhood professional did not answer and the other gave a general answer: ‘by including aspects of it [the environment] in different parts of the program’. Their answers to this question the second time were comprehensive and encompassed all of the activities outlined above. Both early childhood professionals believed they had a much better understanding of the natural environment and ‘a greater respect for it and what it can teach us about life’, as a result of their participation in the research.

**Findings**

This project showed that arts-based pedagogies were effective for teaching young children about the natural world, and that there were benefits for the early childhood professionals involved as well as for the children they worked with.

The benefits for the early childhood professionals included:

- an enhanced understanding of the natural world
- new techniques for developing child-centred curriculum through creative media
an increased understanding of how the natural world can be incorporated into all aspects of the program for the children

an increased understanding of the children and the elements of the natural world with which they identify

an increased interest in, and new techniques for, storytelling

additional tools for recognising and guiding the social dynamics in the group and for supporting individual children in understanding social behaviours through the content of the stories.

The limitations of the current research process are also apparent. The short time spent with the early childhood professionals made it difficult to support them in developing confidence in all of the techniques involved. This was particularly evident in the development of songs, verses and movement, as neither participant was naturally inclined toward these types of expression. They appeared to be more comfortable with storytelling and visual arts. Given that the research sessions were few in number and held after work, it is not surprising that there were areas where additional time could have been spent in developing technique.

The children appeared to embrace the environmental content of the project and the mediums through which it was introduced. They appeared to develop:

an enhanced understanding of aspects of the natural world such as life cycles, growth, habitats and environmental features

an increased ability for recognising features of the natural world

additional techniques for using creative mediums for expressing elements of the natural world

new ways of talking about the natural world, expressing new ideas about care and nurture of environmental features with which they identified

additional tools for understanding personality characteristics and managing social dynamics (based on analogies in the stories).

## Conclusion and future directions

The findings give rise to many new research questions. They point to an association between the children’s understanding the natural world and understanding social dynamics. To some extent, this echoes Dewey’s (1926) sentiments about the natural world being a primary source of cognition and understanding, and those of Cohen (2000), who claims our disconnection from nature has a profound effect on our psychology. This research also shows that children take a greater interest in their immediate natural environment when they experience the sort of exposure to the natural world inherent in this project. Future projects may ask if this kind of exposure would also support the development of a greater sense of ‘identity in place’ (Prohansky & Fabian, 1987) or feeling of belonging in the natural environment.

The experience of the early childhood professionals also suggests that artistic exploration of the natural world enhances one’s sense of it being important for its own sake and deserving of our respect. The outcomes suggest that using arts-based pedagogies for teaching young children about the environment are effective but may be limited by the capacity of early childhood professionals to employ them. This has implications for their pre-service education. Future projects may ask to what extent can artistic media be used to assist early childhood professionals to share their understandings of the natural world with the children they work with. This is an interesting question from the perspective of ecopsychology and ecoliteracy.

A finding that also gives rise to new questions is that of the effect of the storytelling (and its content) on the behaviour of groups of children and/or individual children. Given the challenges often faced by early childhood professionals in guiding children’s behaviour (Porter, 2003), a practical extension of this research would be to explore the link between creatively presented stories about the natural world and social dynamics in childcare settings.

These questions now form the basis for a PhD project the author has embarked upon with the University of Western Sydney.

**Kumara Tarr**

University of Western Sydney
Climate change and its impact on young children


This excerpt, adapted from a paper written by education-for-sustainability expert Julie Davis, provides a valuable explanation of climate change and what we, as early childhood educators and carers, can do about it.

In a very short space of time, global warming and climate change has ‘hit the radar’ at all levels: individually, locally, nationally and internationally. In Australia, attention to climate change and its environmental, economic and social impacts has been spurred on by deepening concerns about diminishing water supplies, rising fuel costs and uncertainty about future energy supplies.

What is global warming?

In a nutshell, global warming is the Earth being made warmer than it should be, by the increasing presence of gases that trap heat in the atmosphere. The process is similar to that of a greenhouse, where the inside air is warmed by the sun’s rays and cannot readily escape.

While the trapping of heat is a natural phenomenon that enables humans to live on Earth, scientists believe the planet’s climate system has become unbalanced as a result of human actions such as burning fossil fuels for energy, and the clearing and degradation of forests.

As global warming causes the oceans to heat, other adverse environmental impacts occur:

- increases in extreme weather events
- prolonged droughts and heat waves
- melting of ice caps
- retreat of glaciers
- higher sea levels
- acidification of the oceans
- changes to marine life cycles (Lowe, 2007).

The overall result of global warming is a much-diminished Earth, with significantly reduced capacity to support the 9.4 billion people who are anticipated to inhabit it by 2050 (US Census Bureau, 2006)—including our own children and grandchildren.
A recent study by Lawrence Lam (2007) also points to specific health risks associated with global warming. Lam, a paediatrics specialist from the University of Sydney, found it is likely that global warming will lead to increasing numbers of preschoolers being treated for fever and gastroenteritis at hospital emergency departments, because young children have less capacity to regulate their bodies during heat waves.

**What is sustainability?**

Global warming is obviously a major challenge for us all. However it is a symptom of a much bigger issue: we humans are living unsustainably on Planet Earth. Our ‘ecological footprints’ are too big—we would need at least three more planets if everyone lived like the average Australian (WWF, 2006, p. 19).

Sustainability, though, is about much more than ecological issues; the effects of our unsustainable lifestyles take many different forms. Leading international epidemiologist Tony McMichael suggests that we are already seeing some of the negative effects of modern ways of living, with increased health impairments arising from chronic health problems (2003). Such problems include rises in obesity and diabetes, heart disease and cancer, and the growing impact of depression and other mental health issues.

Sustainability is also about social justice and intergenerational equity. The causes and effects of unsustainable living are disproportional and unevenly distributed. While some humans enjoy the benefits of global economic development, industrialisation and new technologies, others are bearing the risks and costs—with the poorest nations, and the poorest people within nations, most at risk (Lowe, 2006).

A role for early childhood education

Unless we change our ways—and soon—our children and future generations will inherit a sadly depleted earth, and their own contributions will exacerbate the problems. Children are, after all, already growing up as ‘little consumers’, many already suffering from what has been termed ‘nature deficit disorder’ (Louv, 2005)—the cumulative effect of a lack of experience in, appreciation of and care for the natural world.

The early childhood education field, until recently, has been very slow to take up the sustainability challenge. Nevertheless, there are some excellent examples of early childhood centres and services that do model sustainability as part of their curriculum, thereby supporting children to be social and environmental activists. It is important to congratulate and showcase such organisations, in order for us all to learn and benefit from their example.

**What can the early childhood education field do?**

While being informed about global warming and its impact on young children is important, it is not enough. We must focus on how even very young children—with the support of caring and concerned adults—can be agents for change. As educators, we all need to develop dispositions that encourage care and consideration of the Earth, of each other and for the future.
- Ensure children get to play in quality, natural environments (or, at least, in ‘naturalised’ outdoor settings) where they can have deep engagement with the natural world.

- Involve children—as participants with legitimate ideas, perspectives and creative responses—in authentic learning and action around meaningful environmental and social issues.

- Model ‘green housekeeping’ practices in our early childhood care and education centres and services, such as minimising waste, and reducing water and energy consumption.

- Build sustainability into policies and practices so others know where we stand, and use this to communicate with and educate the wider community.

- Find out more about climate change and sustainability issues—seek current, reliable information about the state of the planet.

- Join early childhood environmental education networks and become campaigners and co-learners with colleagues.

- Use collective power to challenge employers, professional associations, accreditation services and teacher education institutions to include education for sustainability as part of pre-service education and professional development.

- Advocate for ‘child-friendly’ communities, towns and cities where urban design, transport systems and architecture enable children and families to have safe, open environments that promote play, health and wellbeing.

And, finally, ask yourself what you can do in your early childhood setting. Think and act now!

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Julie Davis’ complete paper is available as part of Early Childhood Australia’s ‘Sustainability, global warming and climate change’ resource theme, along with links and useful resources, at: [www.earlychildhoodaustralia.org.au/sustainability](http://www.earlychildhoodaustralia.org.au/sustainability)

**References**


Why do young children need to know about climate change?


This is an excerpt adapted from a paper written by Tracy Young, in consultation with the ECA Victoria Environmental Sustainability Special Interest Group, which provides responses to common questions and concerns about climate change that early childhood educators are likely to face.

Are we really sure climate change is happening?

It may be comforting to deny the scientific information about global warming, but the evidence is now overwhelming. Recent reports from the United Nations’ Intergovernmental Panel on Climate Change (IPCC, 2007) prove that vast quantities of carbon dioxide and other greenhouse gases, created by human activities, are warming the planet. As former United Nations Secretary-General Kofi Annan has said, ‘The question is not whether climate change is happening but whether, in the face of this emergency, we ourselves can change fast enough.’ (Annan, 2006).

Climate change will directly affect the lives of young children—both now and in the future. It would be irresponsible for us not to share this information with children, to give them the opportunity to learn how their actions impact on the health of the planet. This knowledge enables children to learn how to be part of the climate change solution and teaches them that they can make a difference.

How does learning about global warming help children prepare for school?

Many schools across Australia are now involved in sustainable school programs. Learning about sustainability covers a broad range of knowledge, including science, technology, geography and social studies—so children can learn a great deal from experiences that relate to global warming.

Living sustainably develops a deep connection with plants, animals, people and the earth itself—a viewpoint that acknowledges that we are an inseparable part of the web of life. This is lifelong learning that will help to develop respect for all life-forms and the systems that nourish them.
These are the skills, attitudes and knowledge that will be required to live in a sustainable world, now and in the future. It is important that this learning occurs during the early years, where the foundation for later learning is set.

Does an environmental program mean that children can’t play with water?

This is an interesting question that early childhood educators have been debating throughout the past few years of drought. Like many questions that relate to sustainability, there is not always a clear answer; it depends on location, philosophy and how the water is used.

Some services in areas with very low water reserves have decided not to use water, as it seems incredibly wasteful when the need to conserve water is a priority.

For other services, the benefits of water use for children’s play outweigh a total restriction.

These services may undertake strategies to conserve water, such as using water tanks, reusing the water on the garden or restricting the daily amount used in sandpits and water troughs. If children are not allowed to play with water, it is difficult for them to learn how to conserve it.

Water use is an issue that we need to keep debating; and educators, families and children must be actively involved in this discussion. Water management is an opportunity to equip children with the lifelong skills and attitudes that create transformative knowledge.

What kinds of things happen in environmental sustainability programs at children’s services?

There will obviously be a range of differences between individual services in how this occurs. However, an environmental sustainability program needs to embrace a holistic approach that explores issues of waste, water and energy reduction, along with practices that minimise the use of toxic cleaning products.

Children may be actively involved in activities such as using recycled art materials; growing, harvesting and eating food crops; or simply having opportunities to connect with the natural world.

A vital component of a sustainable program is to allow for transformative learning. Transformative learning encourages problem-solving and critical thinking about issues such as global warming. If we are to avoid the mistakes of the past, not only do we need to improve our understanding of the world, but we need new solutions to create change for sustainability.

Living sustainability develops a deep connection with plants, animals, people and the earth itself...
So how does this take place with babies, toddlers and young children?

Learning about sustainability starts with everyday practices of limiting waste, and reducing energy and water use—by collecting rainwater; minimising the use of heating and cooling; turning off lights and power switches when not needed; or putting food scraps in a compost bin.

With babies and toddlers, it is vital that adults model these practices and involve them in the process. This may mean verbalising what is happening, or using songs and rhymes.

With children over three, adults can begin to discuss the reasons these practices are needed. This encourages deeper learning, where children become critical thinkers, helping them to understand the impact that our actions have on the planet.

Conclusion

Climate change is a global issue, but young children need to become engaged at a local level. Local action could include a government art mural project, sending a letter to the local newspaper or taking part in Clean Up Australia Day. Involving children in advocacy projects, however small, teaches them that they are active participants and can make a difference to society.

Tracy Young

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References and further reading


Thinking of children:
Democratic approaches with young children in research


This article examines the research approach used in a case study of young children’s involvement in a kindergarten environmental education program. Three key principles underpinned the research process. These principles were trusting relationships, respectful communication and democratic participation, and they were seen as ways to find solutions to ethical issues around children as participating partners in research. The approach allowed for children’s voices to be heard and their contribution to the research valued. The premise of this approach is linked to a key principle of early childhood education for sustainability (ECEfS)—democratic participation which highly values the contribution that children make to discussions on environmental issues related to their lives and interests.

Introduction

In 2006 we implemented a small research project that involved three- and four-year-old children, their families and teachers in a case study on the environmental education program in their local kindergarten (Vaealiki & Mackey, 2008). As researchers, we valued the perspectives children would bring to the research, therefore the study was designed to maximise ways for young children to share their ideas. Because the project was investigating the way young children participated in and contributed to the centre’s environmental program, it involved many interactions with the children, their teachers and their families. Therefore, we were committed to developing a research process that respected the rights of children and families and provided a range of ways for them to participate.

This is in keeping with the views of Clark (2005) and Te One (2007), that research which values young children’s active participation and listens to the diverse voices of childhood makes an important contribution to the discourses on children’s rights. We now feel it is timely to share the rationale behind the research approach and how this approach reflects some key tenets of early childhood education for sustainability (ECEfS): the child as a right-holder; meaningful dialogue and engagement with children; respecting and appreciating diverse contributions; and democratic values and principles of participation. These key ideas informed our engagement and relationships with the teachers, parents and, in particular, the young children who participated in the study, as well as having a strong impact on our style of communication and how we invited children to participate.
**Participatory research in an ECEfS context**

Increasing concerns about global warming and early childhood’s role in supporting sustainable practices has led to calls for more research in this field (Davis, 2009). Elliott and Davis (2009), key writers in the field of ECEfS, state that recent research has given evidence that within appropriate pedagogies, young children have been shown to be significant players in the changes needed for creating sustainable futures (p. 71), yet we still require greater understanding of children’s participation. Davis (2009), concerned about the limited research base in ECEfS, has signalled the urgent need to increase research capacity in order for it to become a ‘legitimate new field of research endeavour’. Hence the need for researchers to disseminate not only their research findings but also the research approaches that uphold key ECEfS tenets. We hope our own research will generate discussion and reflection about children’s engagement in future ECEfS research and encourage further innovation that is cognisant of children’s right to have a voice and share their perspectives about ECEfS.

There is a growing body of literature that discusses the rights of children in research and how children are recognised for the insights they bring to it (Clark, 2005; Smith, 2007; Te One, 2007). This has arisen because of the concern that children are often marginalised in research processes because of their perceived immaturity (Christensen, 2004; Qvortrup, 1994; Smith, 2008). This raises a number of questions about how children are involved in the research process and the ways children are given voice and opportunities to engage with the researchers and other participants. Robbins raises the issue of affordance and asks ‘what structuring of opportunities is occurring that affords or does not afford participation in and observation of community activities’ (2005, p. 145). We would add, ‘how are children afforded the opportunities to comment or give an opinion about their participation and learning through experience in their communities?’

A number of writers have also commented on ethical and participatory issues pertaining to research with children (Davis, 2009; Christensen, 2004; Thomas & O’Kane, 1998). Davis (2009) has recognised that the ethical and practical issues around working with young children are often the reasons for there being limited research, particularly in respect of the protection of children and their limited skills in understanding and expressing their ideas.

Christensen (2004) suggests that three major themes must be considered when including children as participants in research: the ‘culture of communication’ requiring researchers to understand the ways children express and represent their ideas; the relationships between the children and the researcher; and the awareness of power issues, given that participatory research is a social process. We looked very carefully at these ethical and practical issues as we planned the research, focusing on solutions that were respectful and minimised the impact of researchers entering into the child’s world within the kindergarten environment.

**Research background**

The research took place in a New Zealand kindergarten over a period of six weeks and involved three teachers and 30 three- and four-year-old children. In addition, three parents and a kindergarten manager were interviewed. We gathered data through conversations with children and teachers, during routines and play episodes, collecting children’s drawings and photos of constructions, observational diaries, photos of the environment, learning stories, and formalised interviews with the adults. Combining data in this way allows children a range of different forms of expression through which they are able to express their ideas and contribute to the research findings.

The research method used in this study is compatible with the tenets of ECEfS and the sociocultural approach that underpinned the environmental pedagogy and curriculum practices at the kindergarten, allowing learning to take place within a dynamic cultural community where each person makes an active contribution (Rogoff, 2003). The sociocultural approach was chosen as it informed the inclusive and democratic principles we wished to use as researchers, given that children are ‘stakeholders’ in their learning community, having rights and a voice in the research process and involvement in collective decision making and action (David, 2007, cited in Davis, 2009).

Communication with children was vitally important to us and was paramount in establishing a culture of respect through which ideas could be exchanged, questioned and elaborated. As researchers in the field we needed to understand the full breadth of our responsibilities to those being researched, as there is the potential for inadvertently hindering children from being treated as authentic partners. There were times when we wished we could have revisited the moment, such as when an adult needs to stop talking and give space for a child’s ideas and expression to emerge.
In the following section we will explore some issues of the process that might typically be found in a research project involving young children.

**Critical research issues**

**Gaining consent and informing participants**

Gaining consent from young children is an ethical issue that is debated among researchers, since, legally, children do not have the authority to make decisions regarding their participation in research without adult consent (Te One, 2007; Thomas & O’Kane, 1998). Traditional approaches ask the parent or guardian to give consent for the child, often without the child being included in the decision making. In our research, however, we wrote a letter to each child explaining several ethical issues that could be expected to be covered in the consent process. The letter demonstrated our wish to uphold the democratic intentions we had for the research. It used language children would understand and invited them to ask questions and share any concerns they might have with the parent or teacher.

The first section of the letter was an introduction to the research project and us:

> Glynne and Sue will be coming to your kindergarten to talk with you and the teachers about how you help your teachers care for the gardens, and the worms at your kindergarten and how you recycle your rubbish. Glynne and Sue are called researchers and that means that they talk with people to find out about the special things that they do and to find out about their ideas.

The second section dealt with the right of participants to withdraw from the process:

> We know that sometimes it’s difficult to talk to someone you don’t know, so Glynne and Sue will understand if you don’t want to talk to them. If you start to talk to them and you don’t want to anymore that’s okay.

In the third section we explained the right for participants to have more information about the research:

> If you think of any questions you want to ask Sue and Glynne you can ask them when you meet them at the kindergarten. You might like to ask your mum or dad or caregiver to write your question down and you can give this to your teachers.

Parents and teachers were given an information sheet so they could respond knowledgeably to the children’s questions and ensure continuity of discussion between kindergarten and home before we entered the kindergarten to begin gathering data. To indicate that children were informed about the research, parents signed a consent form confirming they had read the letter to their child.

**Moving into the field**

As researchers, we were aware that we were moving into the children’s space. To minimise any impacts from this ‘intrusion’, we set about developing a relationship with the children before any data was gathered.

On our first day at the centre we spent time getting to know the children and understand the rhythms and culture of the centre. The children were used to gathering for a ‘circle time’ to welcome each other. This was the first forum for the children and us to meet face to face. We explained that we were in their place to do some research and would be talking with them about how they help the teachers to look after the environment:

> When we come we will write stories about the things you know about the environment. It’s called research. We want to search for new ideas. We want to know about your good ideas. What do you think research means?

Here are some of the children’s responses during the first ‘mat-time’:

> It’s searching for things that are lost!
> It’s searching for treasure.
> It’s searching for slugs and snails!
> My dad ate a slug!

We found their view of research to be inspiring. Their metaphorical suggestions on the meaning of research were very powerful. We were reminded of the way children teach us to view the world from a different perspective and felt this was very fitting for an environmental research project. Their view of research clarified and confirmed for us what we were there for and the importance of working closely with children in participatory research. During this mat-time we demonstrated the digital voice recorder. The children sang and we played it back to them. They were all delighted to hear their voices from the recorder. Some children perceived what we were interested in, so enthusiastically proceeded to show us around and to point out other useful technologies found in the centre.

One child jumped up and said, ‘I’ll show you around.’ She led us on a tour of the outside environment, past the garden where she proudly pointed out a sign she had made: Our Garden Please don’t step on the plants! ‘We water the plants any time’ she told us.
Another child wanted to show us how the camera printer worked and took great care to explain this.

The children took the initiative in conducting this tour of their kindergarten. Tours are effective ways of allowing the child to take the lead; to communicate their perspective, and to point out what it is important to them as well as what they perceive to be important to us (Clark & Moss, 2001). This reinforces the importance of engaging with children on their terms, believing in their competency and letting them lead the way.

Initial connections were formed easily during these introductory sessions as the children became used to our presence. We found ourselves quickly involved in their conversations and play. Conversations at morning tea time about worms, compost and recycling; conversations about inventions such as ‘penguin-saving devices’ to be used in Antarctica; children using local volcanic rock to build dinosaur caves; children in the garden talking about how they used the parsley in their egg sandwiches; children involved in sociodramatic play where they were the recycling people who sorted, trampled and flattened cardboard ready for the kerbside.

It was not until the third visit to the kindergarten that we felt our relationships with the children were such that we could begin recordings and note-taking as the children became involved in the daily program.

**Ongoing data collection**

Over the next few weeks we continued to gather a wide range of data. Interestingly, the children responded to us as researchers, not as teachers, and maintained through their actions and responses this clear delineation of the role. It was difficult to know how the children understood this, but our openness about the research process and its purpose was one factor assisting the children. They continued to approach the teachers about the everyday issues around the behaviour of peers; availability of resources; sharing experiences and the routines of the setting. If a situation arose where we could be of assistance, or when invited by children to join with them, then we responded, even to tiding up at the end of a session as we felt we were included in the centre community, not separate from it.

We were very aware of reducing power issues between the researcher and those being researched, and therefore we employed a number of strategies. In general we waited for children to invite us into their play or routines. We engaged in conversations rather than ask questions which would elicit a response, and we ensured that data gathering could be as natural and unobtrusive as possible. We joined children at their morning tea time and became involved in conversations about the sorting of food and wrapping waste. In these moments we listened to children guiding new or younger children about how to sort their food scraps, and they explained to us their recycling system.

Children’s views need to be listened to carefully. Researchers should be tentative in their conversations with children because children may not always find it easy to express themselves in a way that adults understand. We were open to obtaining data through a variety of media, enabling children to have more opportunity to participate. We found that occasionally there was a conflict between what the children were saying and what we as adults understood this to mean. For example, as we chatted about the food that worms do not like, such as orange peel, one child made connections between the plastic wrap and the discarded peel. He said, ‘Plastic isn’t good to eat ‘cos it’s bad for your circulation’. It is likely this child knew that, in some way, the eating of plastic was not able to sustain life. This example illustrates the importance of listening to children as they attempt to understand the human impact on the natural world.

After the weeks of data collection we now needed to plan the most respectful way in which to withdraw ourselves from the kindergarten.
Bringing closure to the research process

Planning for closure is equally as important as entering the research field. As researchers, we felt privileged to have been involved in the everyday experiences of the kindergarten. When it was time to say goodbye, the question uppermost in our minds was how we should do this in a way that acknowledged the trusting relationships we had built and our commitment for this research to be underpinned with respectful communication and democratic participation. We had been open and respectful in our introductions and felt that the farewells should also reflect these traits. As researchers we had become part of the routine for a short while, and the children expected to see us on specific days. In order for the children to feel competent and empowered, they had to be able to predict our next meetings with some certainty. At the end, they needed to know when we would be leaving.

Therefore, bringing closure to our involvement with the children needed to be formalised. At the start of the project we observed an excitement and anticipation in the children and teachers about what was ahead. Closure, on the other hand, signals the end of the research process where connections and relationships are less likely to continue through regular visits to the kindergarten, and may in fact be ended.

In planning for the last circle time, we discussed the importance of thanking the children, sharing our initial learning from our visits, and reflecting on the research process. The last circle time began with the children, teachers, parents and ourselves gathering together at the end of the kindergarten session. This meant parents who had been involved in the project could also be present. We sang songs we had all come to know, and recalled with the children some of our shared experiences.

By bringing closure to our involvement, we felt we were able to be true to the democratic principles of trusting relationships, respectful communication and democratic participation that were embedded in our research.

Some final reflections

Engaging with young children in research often means traversing challenging terrain and finding new ways of working with children. The research process can assist with providing authentic and democratic ways for young children to share their ideas and think about environmental and social issues in their learning communities that will be of value to the ECEFS research field. Through our understanding and application of research, working with young children has opened doors to a wider range of perspectives on how children’s voices add to the research.

We strongly advocate that researchers who develop projects involving young children keep to the forefront of their minds the principles of respectful communication, trusting relationships and democratic participation. By doing this, researchers empower young children to strengthen their role as citizens in their communities, today and for tomorrow.

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References


A way of travelling:
The environment and our Code of Ethics


Catharine Hydon is a member of the Code of Ethics national working party who have been working, since 2003, on a revision of the code, originally drafted in 1990. The new version was finalised in late 2006.

A code of ethics is not a ‘set of rules or even a road map: it’s a way of travelling, a mind set; a resource for the journey’. Ethical practice is ‘not a destination: it is more like the calibration of true north on a compass, maintaining our sense of direction while leaving us free to explore whatever lies ahead’ (Mackay, 2006, my emphasis).

The ethics of sustainability

A friend of mine is expecting his first child next year and asked me to recommend childcare centres. After visiting several, one thing particularly stuck in his mind: ‘What’s this thing about teaching children about the environment? They’re only babies—surely they’re too young to have to worry about recycling and all that?’

Given the increasing frequency of environmental catastrophes and evidence of global warming, my answer was, ‘how can we not talk to children about sustainability?’ How can we ignore such an important part of our lives? Might it actually be considered irresponsible not to show children that the ways in which they behave towards the environment will impact the rest of their lives and those of future generations?

Dahlberg, Moss and Pence (1999) suggest that if we are to see children as more than just biological beings—as co-constructors with agency and power—then we need to invite them into a collaboration of learning and teaching that includes tackling issues that our society faces.

Of course, this does not mean that young children need to debate the merits of carbon trading. What it can mean is that they are engaged in local action, learning about their contribution to the bigger picture. This response—as the Code of Ethics suggests—will help children to understand ‘that they are global citizens with shared responsibilities to the environment and humanity’ (Section I, point four).

If the response to Al Gore’s visit to Australia indicates anything, it is that ordinary people—especially families and children—recognise the issue of environmental sustainability as their business. It must become early childhood business as well.

But it must be more than community pressure that determines ‘the way we should travel’. It is ethics that impels us to contemplate the direction of our interactions with children and their families. We have an ethical obligation to teach, demonstrate and explore the environment with children, and to help them understand our role in caring for where we live.

What’s this thing about teaching children about the environment?
Conclusion

Given the increasing frequency of environmental catastrophes and evidence of global warming, my answer was, “how can we not talk to our children about sustainability?”

Considering the ethical dimensions of environmental education does not automatically mean making radical changes to practice (although a rudimentary examination of evidence might point us towards this sort of change), but it does require us to review a plethora of new information and ideas—such as those detailed in this issue of Every Child—in order to review what we present to children in daily program planning and practices.

Mackay suggests that we use ethics as a guide to true north, as a way of measuring what is worthy of children’s attention and what is important for them to know as citizens of the 21st century. Environmental education is a worthy candidate, necessary to progress towards a secure future.

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References and further reading


Environmentalising early childhood education curriculum through pedagogies of play


In recent years the concept of child-centred play as an informant to the early childhood curriculum has been critiqued as an insufficient pedagogical approach for supporting children’s knowledge development. Running in parallel with these criticisms has been the emerging importance of environmental education in early childhood curriculum. A key aspect of early childhood environmental education involves children experiencing and acquiring various environmental concepts. This paper reports the findings from a project aimed at examining play-based learning and the way different types of play can be used as a pedagogical basis for supporting children’s learning in early childhood environmental education. The arguments about play-based learning and the role of environmental education in early childhood curriculum are framed in relation to the newly released Australian Early Years Learning Framework.

Play-based learning and the early childhood curriculum

Play-based learning in the early childhood curriculum has historically been associated with the notion of child-centred pedagogy. While the idea of child-centredness might seem self-explanatory, a comprehensive investigation into how the term is used in the field by Chung and Walsh (2000) discovered that up to 40 different interpretations of the concept were found in texts associated with early learning. These interpretations included reference to learning based on children’s interests; children’s participation in the decisions related to their learning; and an emphasis on the individual development of children in relation to particular developmental stages (Chung & Walsh, 2000, p. 216). Chung and Walsh articulated these interpretations
to the philosophical works of Frobel and Dewey and to the discourse of developmentalism. Historically, these theoretical and philosophical informants have suggested an emphasis on play-based learning that has seen curriculum informed by the idea that the child and the child’s experiences should be central to all learning (p. 229).

In recent years, the suggestion that the early childhood curriculum should be informed primarily by child-centred notions of play has been under increased discussion from a range of theoretical perspectives, including the cultural-historical, feminist, post-structuralist and post-modern movements (Wood, 2010; Yelland & Kilderry, 2005). Collectively, these discussions are increasingly referenced by the term ‘post-developmental’ (Blaise, 2009), and have raised questions regarding the social, cultural, gendered and economic assumptions associated with the role of child-centred play in early childhood curriculum (Langford, 2010). An important aspect of the post-development conversation has been consideration of the extent to which children are supported in the acquisition of content knowledge through child-centred play (Hedges & Cullen, 2005; Tzuo, 2007), particularly where play-based learning involves a predominance of open-ended and freely chosen play activities:

The established child-centred ideology reinforced the focus on activities rather than outcomes, and less attention was paid to specifying desirable knowledge, skills, understanding, dispositions, and outcomes, within a clearly articulated curriculum framework. The notion that curriculum content arises through needs and interests was one of the key weaknesses of the developmental approach (Darling, 1994; cited in text). For example, showing an interest in a range of topics or activities is not the same as making meaningful connections in which learners acquire, test, refine and reflect on their knowledge and skills (Wood, 2007, p. 123).

The research emerging from a reconsideration of child-centred play in the early childhood curriculum is contributing to a depth of knowledge regarding the importance of teacher interactions during children’s play (Fleet, 2010; Siraj-Blatchford, Taggart, Sylva, Sammons & Melhuish, 2008; Ryan & Goffin, 2008); the relationship between children’s cultural experiences and their funds of knowledge as a precursor to play-based learning (Brooker, 2005; Hedges, 2008); and the role of teacher planning for learning in play-based activities (Edwards, Cutter-Mackenzie & Hunt, 2010; Gibbons, 2007).

Collectively, increased research and theorisation in the field is beginning to suggest that 1) play-based learning needs to draw on and recognise children’s existing cultural competencies; 2) acknowledge and actively include the role of the adult educator in connecting children’s play activities to particular conceptual and content-based ideas; and 3) promote the importance of teacher planning for learning in relation to children’s play and the acquisition of content knowledge. Contemporary research regarding the role of play in the early childhood curriculum therefore represents a shift from the primary developmental child-centred orientation to a focus on the nature of the dynamic relationship between children (learners), teachers and content (Ball & Forzani, 2007; Grieshaber, 2008) within a play-based framework that moves beyond child-centred versus teacher-directed dichotomies (Broadhead, Wood & Howard, 2010).

Play-based learning needs to draw on and recognise children’s existing cultural competencies.

Early childhood environmental education

The importance of the early years has been acknowledged and recognised in environmental education for some time (Carson, 1965). While emerging discussion in the area has suggested that Australian early childhood environmental education may be viewed as ‘marginal’ (Davis & Elliot, 2003), an historical, philosophical connection to nature-based learning in the early years can be derived from the early philosophical works of Frobel. Interestingly, it is these works that are also connected to notions of the naturally unfolding capacities of the child which support arguments regarding the role of child-centeredness and open-ended play in early childhood education. In recent years, increased development around school-based environmental education, policies and curricula has generated increased interest in the role of environmental education in early childhood education. Despite this increased interest, there has been very little research concerning early childhood education and environmental education. For example, Davis (2009) reported that during the period 1996–2007...
less than 5 per cent of published papers in Australian and international early childhood research journals involved studies concerned with environmental education and early childhood education. Davis (2005; 2009) and Elliott and Davis (2007; 2009) have also argued that there are very few early childhood centres and/or kindergartens in Australia (and internationally) that are demonstrating exemplary environmental education practice. Despite such claims, it is also reasonable to argue from what discussion is available that the practice of environmental education in early childhood currently requires more investigation.

For many years, teachers, parents, researchers and policymakers have asked pertinent questions about the influence of early childhood environmental education experiences on children’s dispositions, knowledge and behaviours later in life (Chawla & Cushing, 2007; Palmer, 1993; Palmer, Suggate, Robottom & Hart, 1999). Palmer and colleagues (1993; 1999) and Chawla and Cushing (2007) have both independently researched this question with adult environmental educators, and have shown a convincing relationship between childhood experiences in nature and the formation of pro-environment beliefs and lifestyles later in life. However, these studies are difficult to relate to children’s contemporary experiences, given the pace of the last two decades where children are living in textual, visual, virtual and highly digitised worlds (Zevenbergen, 2007). As such, there is urgent need for research about the practice of early childhood environmental education and the way in which this is conducted in educational contexts with an emphasis on child-centeredness and the use of play-based learning over the acquisition of content knowledge (Cutter-Mackenzie & Edwards, 2006).

The EYLF outlines the principles, practices and outcomes considered necessary for supporting young children’s (birth to five years) development and learning in early childhood prior-to-school settings across Australia and is a key component of the Australian Government’s National Quality Framework (NQF) (DEEWR, 2010). In this document ‘play’ is presented as a pedagogical practice that connects with children’s learning, while environmental education is related to children’s learning spaces, and is also listed as a subcategory of Learning Outcome Two (Children are connected with and contribute to their world).

The definition of play provided in the EYLF includes historical and contemporary arguments about the role of play in children’s learning. Initially drawing on a more traditional child-centred view, play is defined as providing ‘opportunities for children to learn as they discover, create, improvise and imagine’ (DEEWR, 2009, p. 5). This definition is followed by an expanded description which acknowledges some of the more contemporary research suggesting the need for active involvement on part of the educator to support children’s learning:

*Early childhood educators take on many roles in play with children and use a range of strategies to support learning. They engage in sustained shared conversations with children to extend their thinking (Siraj-Blatchford & Sylva, 2004; cited in text). They provide a balance between child led, child initiated and educator supported learning (DEEWR, 2009, p. 5).*

Interestingly, this definition of play is followed by an explanation of the concept ‘intentional teaching’ which is defined as teaching that is ‘deliberate, purposeful and thoughtful’ (DEEWR, 2009, p. 5). The notion of intentional teaching challenges the child-centred perspective on play in which children are encouraged to create their own learning and understandings through open-ended and largely self-directed play by focusing also on the role of the teacher in play-based learning. Several pedagogical strategies related to intentional teaching are suggested, including modelling and demonstrating, open questioning, speculating, explaining and engaging in shared thinking and problem solving. The importance of planning for intentional teaching and knowledge building to foster learning is also acknowledged.

Environmental education is referenced in two places in the document. First in relation to ‘Learning Environments’ as an aspect of practice, and secondly as a subcategory of Learning Outcome Two: Children are connected with

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**Play-based learning, early childhood environmental education and the Australian Early Years Learning Framework**

Postdevelopmental research into play-based learning and the role of environmental education in early childhood curriculum have largely evolved independently of each other during the last 10 to 15 years. However, it is interesting to note that these two important aspects of contemporary early childhood curriculum were both recently represented as key elements of Australia’s newly released national *Early Years Learning Framework* (EYLF) (Department of Education, Employment and Workplace Relations [DEEWR], 2009).
and contribute to their world’. As an aspect of practice, the outdoors is emphasised as a uniquely Australian learning environment for young children that provides a platform for ongoing environmental education:

Outdoor learning spaces are a feature of Australian learning environments. They offer a vast array of possibilities not available indoors. Play spaces natural environments include plants, trees, edible gardens, sand, rocks, mud, water and other elements from nature. These spaces invite open-ended interactions, spontaneity, risk-taking, exploration, discovery and connection with nature. They foster an appreciation of the natural environment, develop environmental awareness and provide a platform for ongoing environmental education (DEEWR, 2009, p. 16).

Learning Outcome Two ‘Children are connected with and contribute to their world’ contains reference to a specific subcategory regarding environmental education; namely ‘children become socially responsible and show respect for the environment’. Several indicators for this outcome are listed, suggesting children evidence such responsibility and respect when they:

- use play to investigate, project and explore new ideas
- participate with others to solve problems and contribute to group outcomes
- demonstrate an increasing knowledge of, and respect for, nature and constructed environments
- explore, infer, predict and hypothesise in order to develop an increased understanding of the interdependence between land, people, plants and animals
- show growing appreciation and care for natural and constructed environments
- explore relationships with other living and non-living things and observe, notice and respond to change
- develop an awareness of the impact of human activity on environments and the interdependence of living things (DEEWR, 2009, p. 29).

The positioning of environmental education in the EYLF reflects policy developments in the field of early childhood environmental education in which environmental education is positioned as important in children’s broad early learning experiences (Department of the Environment, Water, Heritage and Arts, 2009; United Nations Educational, Scientific and Cultural Organisation [UNESCO], 2008). It is interesting that the emphasis in these goals is clearly environmental education rather than sustainability, education for sustainability (EFS) or education for sustainable development (EFSD).

This reflects contemporary, yet critical thinking in environmental education research and policy development (Jickling, 2006; Jickling & Spork, 1998) which is yet to more fully inform research and policy in early childhood environmental education (Cutter-Mackenzie, 2005). For example, a recent policy document by UNESCO (2008) is indicative of this stance, suggesting that ‘early childhood education for sustainability is much more than environmental education. It should be broader than simply taking children outdoors to discover the beauty of nature and speaking about the natural environment’ (p. 12). Defining environmental education as merely a study of nature suggests early childhood education may need to engage more fully with the literature derived from environmental education research, policy and development.

While the EYLF references contemporary research into play-based learning and includes elements of environmental education as learning outcomes for children, the connections between these two emerging areas of research and practice in early childhood education require further consideration (Davis, 2009). What does play-based learning interfaced with conceptions of teacher intentionality actually look like? And, in what ways can play-based learning be used to achieve the learning outcomes associated with environmental education from the EYLF? Answers to these questions are beginning to emerge from a research project aimed at investigating how different play-types impact teacher planning for learning, and how teacher interactions with children during these play-types support learning in the area of environmental education.

**Project overview: Examining play-based approaches to learning through environmental education**

The project examines the extent to which different types of play influence teacher planning for learning as well as their pedagogical interactions with children during play as a support. Three types of play are under consideration, including open-ended play, modelled play and purposefully framed play (Edwards, et al., 2010). Open-ended play
involves teachers providing children with materials related to particular concepts derived from environmental education and allowing children to use the materials to create their own understandings of the concepts. Modelled play involves teachers ‘showing’ children how to use the materials to illustrate environmental education concepts prior to allowing the children to use the materials themselves. Purposefully framed play involves teachers providing children with opportunities to use the materials as well as participating in modelled-play experiences.

Sixteen early learning centres across Melbourne, including inner city locations, outer suburban and metropolitan settings have been involved in the project. All settings have included children and teachers from preschools with children aged four to five years ($n = 114$), and the teachers ($n = 16$; three male and 13 female) all being qualified at the Bachelor degree or higher level. All teachers designed and implemented the three play-types for groups of up to six children per centre. Teachers self-selected into the play clusters and each cluster then implemented the play-types in a different order. For example, the three teachers working in Cluster one implemented open-ended play, then modelled play and then purposefully framed play. Teachers from Cluster two implemented open-ended play, purposefully framed play and modelled play. In total there were six clusters each implementing a different iteration of the play-types. Teachers maintained their normal planning and curriculum documentation, in addition to completing reflective journals. Each implementation of the three play-types was video-recorded and the recordings later shown to the children as the basis of a video-stimulated recall group interview.

These group interviews were also video-recorded and focused on discussing with the children what they were doing, and what they believed they were learning during their participation in each play-type. The group interview footage was later shown to the teachers who discussed the children’s responses to their participation in each play-type in relation to their planning for the learning, and their interactions with the children during each play-type. The teacher interviews were also video-recorded.

When planning the play-types, teachers were encouraged to embed concepts of biodiversity into the play experiences. Biodiversity was selected as the conceptual focus area of environmental education as previous research has suggested that it is an area which connects strongly with the lives of young children and teachers and is suitable for integrating into the early childhood curriculum (Carson, 1965; Cutter-Mackenzie & Edwards, 2006; Pearson & Degotardi, 2009). Within the area of biodiversity, teachers were provided with a concept map suggesting ways to think about the concept and how it could be considered within an early childhood context (Figure 1). From this map, each teacher selected the main concept that would inform the three play experiences he or she would implement according to the order of play-type their cluster was assigned. This meant some teachers focused on macro invertebrate (backyard) or Australian animal habitats, whilst others focused on plants, growing food, composting and worm farms. The project was conducted with ethical approval from Monash University Human Research Ethics Committee and the Department of Education and Early Childhood Development. A core aspect of the ethical procedures involved obtaining consent from children and parents/families.

Figure 1: Concept map provided to teachers
Child consent was sought using a child-friendly explanatory statement and consent form (for example, circling a smiling face to indicate consent) prior to participation. On actual days of data collection all children with prior and family consent were invited verbally to participate in the associated activities. Children declining to participate or showing signs of not wanting to be involved (for example asking to leave the activity once they had commenced) were permitted to do so.

Due to the large scale of the project, data analysis for the wider project is still progressing. However early analysis suggests that the implementation of the three play-types allowed the teachers to think more carefully about what they wanted the children to learn and how they would approach this learning as the three play-types were implemented. This paper focuses on the experiences of one teacher from Cluster three who implemented modelled play, then open-ended play and finally purposefully framed play. While the analysis of data within the larger project is focused on linking the children's responses to the levels of teacher planning and the range of pedagogical strategies employed in each play-type, this paper focuses on a qualitative thematic analysis of the teacher's response to the combined play-types in relation her thinking about the relationship between teacher planning, intentional teaching and the children's learning about biodiversity.

Each implementation of the three play-types was video-recorded and the recordings later shown to the children ...

Initially the data was coded according each play-type with connections across play-types then identified as a way of examining the relationship between teacher planning, intentional teaching and the children's learning. In the larger project, the linking between the children's responses to the teacher planning and the range of pedagogical strategies employed in each play-type is situated in relation to the children's responses to their own play, using video-stimulated recall. Here the children's descriptions of their play and learning are linked to the teacher's planning documents and video footage of the teachers engaged in each play-type with the children.

The video analysis software Snapper is being used to code teacher pedagogical strategies and children's descriptions of play and learning. These codes are then being entered into SPSS and used as a basis for linking the children's responses to the different levels of teacher planning and pedagogical interaction for each play-type.

**Karin’s play experiences: Worm farms and the vegetable garden**

Karin was one of three teachers involved in Cluster three. Karin's centre was located in a suburban area of Melbourne and served children from a predominately Western-European middle class socioeconomic community. Karin’s play experiences were designed to build on the children’s existing interest in the kindergarten vegetable garden and focused on building worm farms with a small group of children who participated in the project. The focus on worm farms was also connected to the vegetable garden and the project was extended to the rest of the kindergarten group.

**Modelled play**

For her modelled-play experience Karin prepared a table of materials for making worm farms in large jars. She had small buckets containing sand, soil and leaves. There was also a book about worms open at a page focused on making a worm farm. There were five large glass jars, one for herself and one each for the four participating children. Karin invited the children to the table and said that today she wanted to show them how to make a worm farm. She started layering the materials in her jar, dirt first, then sand, dirt and sand. Finally she placed leaves on the top. She talked to the children about what she was doing and stopped to check her jar against the example in the book. Three of the four children watched her demonstration. The fourth child declined to participate and wanted to paint instead. In line with the ethical principles of consent the child’s painting request was honoured. Following her demonstration the three children began to create their own farms. They began with the dirt and layered the sand and dirt as demonstrated. One child checked her jar against the book as she had seen Karin do. The fourth child left her painting and came over to make a worm farm. The children explained to her what she needed to do. Karin returned and opened a box of worms which she then shared among the children.
Open-ended play

Karin laid out the same materials that were used for making a worm farm as in the modelled-play experience. The four children from the modelled-play activity were invited to participate in making a worm farm again. Karin said to the children ‘I am going to do some work now and leave you to make your own worm farms.’ She left the table and went to another part of the room. Karin’s model worm farm from the first experience was leaning against the book. One of the children looked at Karin’s model carefully before building her farm with an initial layer of dirt. Another child said ‘Karin it says dirt first but I want to use sand.’ She began with a layer of sand, then dirt and added a handful of leaves before adding more sand. ‘Karin, I am done’, she called, ‘I have made some mud for them.’ Karin returned to the table and helped the children to add their worms to the farms.

Purposefully framed play

Karin gathered the four participating children around her on an outside mat. She began by showing the children a worm puppet which had a material saddle around its body. ‘There is something interesting about this worm. It has a saddle’, she said. This led to a discussion about the characteristics of worms. Do they have eyes? Do they like to live in dark or light places? Do they have legs or arms? Karin and the children talked about how the worms like to burrow down into the dirt and how the worms can die if their skin dries out. Next Karin showed the children a non-fiction book about worm habitats and they talked about how the worms live in the soil and are protected by the leaf litter. Karin showed an illustration of a worm working its way towards the leaf litter and talked about how the worm takes tiny pieces of leaf back into the soil. After looking at the book, Karin introduced the children to a poem about worms (Slimy worms by Susie Davies) and then began discussing what they had done on the previous occasions when they had made the worm farms. Karin invited the children into the yard to collect the materials necessary for building a worm farm. The children collected dirt, sand and leaves without further direction and went to a table with more jars for making farms. Karin showed the children the farms they had made earlier and pointed out the tracks left by the worms as they worked their way to the top of the jars towards the leaves. She talked about how the worms used the leaves to make a special ‘worm juice’ called castings and suggested they put the castings on their vegetable garden to help make the soil warm and moist for the vegetables to grow in.

The children began making a worm farm each and Karin continued to read from the book: ‘worms are busy creatures and they play an important role in the garden keeping the soil in good condition’. Karin helped the children add worms to the jars. Two of the children were reluctant to touch the worms saying they were ‘ticklish and scary’, while two others held them in their hands before placing them in their jars.

Karin’s thoughts—linking the play-types and the learning

During the teacher interview Karin shared her thoughts about the relationship between the play-types, her planning for the children’s learning and the learning she believed had occurred. One of the most interesting findings to emerge from Karin’s interview was the way in which participation in the project had challenged her thinking about the relationship between planning for intentional teaching and the children’s acquisition of content knowledge through the different play-types (Edwards et al. 2010). It was also interesting to note the way in which the work of the children participating in the research was integrated with the work of the larger group. These two findings evolved during the interview as Karin discussed the difference between working with the children on the worm farms through the three play-types compared to a previous implementation when the entire group built one large farm:

*It was really nice to re-visit the activities, doing the three sessions, which I probably wouldn’t do, you know, if we made a worm farm once, we wouldn’t have gone back and done that specific activity again unless other children hadn’t experienced it. So I think there was a bit of enriching there doing it three times.*

Karin was asked if she was to do the activity in the future would she continue to implement the activity once with the larger group, or would she take a different approach derived from her use of the three play-types:

*The three-play types, I found that a good way of teaching. You know to actually have it the three ways and to see what they were learning. That made me really think and reflect quite a bit. The three play-types, it was a bit like scaffolding, like each time, even though in the modelled they seemed to have gained the most. But I still think each time they were learning more about the worms and getting a depth of learning.*
Here Karin was interested in the way in which the three play-types had worked in combination to support the children's learning about the ideas associated with environmental education. So rather than focusing on one implementation of the experience, or thinking about using only one play-type (such as open-ended play) Karin reflected on the way in which using the three play-types together seemed to support deeper learning for the four children participating in the research. This finding aligns with research suggesting that open-ended play alone is insufficient for supporting children's learning (Hedges & Cullen, 2005; Langford, 2010). Karin then talked about how the learning of the four focus children extended throughout the group:

We had lots of discussion after the activities (after the filming) and what I thought has been lovely has been this group of children (research group) has been teaching the other children. So there has been lots of interest and questions and lots of perusal of books about it. We made a big worm farm all together (the whole group) after the three play sessions. The four children, they participated in this, and they talked about it and showed the others. They were quite keen to go and get their jars and show the children the tracks. There was a lot of inquiry.

Karin suggested that the depth of knowledge obtained by the four children was illustrated by their capacity to engage with and lead the other children. A consequence of this was that the children were then able to participate in peer learning, a form of learning highly valued by Karin:

To be able to talk to the other children about the different things, like the saddle and the babies and what worms like. I thought that it was very interesting to hear what they had retained each time. Even to talk about the soil and the compost and putting that all together. In one of our discussions we were looking at the leaves in the book and talking about the worm taking the leaf down and one of them said ‘it needs to make air through the track’ so there was a lot thought. I liked it when the children were teaching the other children because it is good learning for them. They learn a lot from their peers. There was one child (not in the research group) and he said he found a worm at home and it didn’t have a saddle. So he was using the words, he had the knowledge of what a saddle is.

When asked how the implementation of three play-types compared to her previous approach of implementing the experience as a ‘one-off’ activity, Karin suggested that having modelled play and open-ended play prior to purposefully framed play had made her think more carefully about her pedagogical strategies and how she was going to help the children learn the content associated with the worm farm:

I think having the three play-types and going into the purposefully framed (after the modelled and open) had me really thinking about what I was going to do, what I was going to discuss with them and how I was going to build on that knowledge. The play-types really did make me think about it a lot more.

The increased level of thinking about how she would teach what she wanted the children to learn through the play-types was considered by Karin to have supported the learning of the four research children which was extended to the broader group. Karin suggested that having made the farms three times in the jars with the smaller group meant that there were models for the other children to learn from:

It gave that little group a chance to teach the others. In the larger group the discussions were led a lot more by the small group. I think having this smaller group made it move in a different direction. When we went outside, they were actually showing the others the tracks in their jars. And that probably made a difference to the understanding of the others. Because if you think we’re going to say ‘we are going to make a worm farm’ and you just make it, well, you might talk to them about tracks and what the worms are going to do, but they can’t see it. They don’t know what tracks are. But if you have the other children and they can go and get their jars and say ‘look at the tracks’ well that’s a big connection.

Here Karin was discussing a shifting pedagogical approach in which her thinking about the relationship between intentional teaching, play and the learning were linked to use of the three play-types in combination. This was a particularly interesting suggestion, as the initial aim of the project had been to determine which of three play-types was more likely to prompt teachers to plan for learning, and therefore allow the children to talk more readily about what they had learned. However, Karin described how the combined play-types prompted her to plan for intentional teaching in a way which supported the learning of the core research group which was then integrated into the learning of the larger group. This suggests a tentative response to the questions raised earlier about how play-based learning might be integrated with intentional teaching to allow
children to achieve the learning outcomes associated with environmental education from the EYLF.

Karin’s experience suggests that the three play-types build on each other to form a structure in which the children can continue to build a depth of knowledge, rather than having a one-off learning experience through a particular activity or through participation in only one play-type. This finding builds on existing research which emphasises the importance of teacher interactions during play (see for example, Siraj-Blatchford et al., 2008 and Thorpe et al., 2004). Karin referred to this as ‘a bit like scaffolding each time’ which indicates an alternative way of thinking about intentional teaching, such that it could be considered in terms of how the three play-types will ‘lead into’ each other as a basis for scaffolding deeper learning over time. In part, this more scaffolded or structured approach to play and intentional teaching reflects the fact that learning about the environment involves learning particular content and concepts which children may not necessarily access through child-centred play (Wood, 2007). Karin touched on this when she compared the difference between the play-types, and what each might offer in terms of children’s learning:

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 farm for open-ended play. Something like this needs to be modelled and discussed.

Karin’s experience of the three play-types and the worm farms suggests one way of thinking about how intentional teaching can be integrated with play-based learning to support children’s learning in the area of environmental education. This moves towards an integrated approach in which pedagogical strategies associated with each play-type can be combined to create an overall learning experience. For example, 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-type 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.

**Implications and conclusion**

Karin’s interpretation of the three play-types as pedagogically linked suggests that children can learn content knowledge associated with environmental education within the context of the early childhood curriculum. Thinking about the three play-types in combination rather than focusing on what each has to offer teaching and learning as a single pedagogical platform provides a way of responding to the literature which increasingly emphasises the role of teacher interactions during play (Fleer, 2010; Ryan & Goffin, 2008; Siraj-Blatchford et al., 2008) and teacher planning for learning before play (Edwards et al., 2010; Gibbons, 2007). These ideas, which are reflected in the EYLF through the concepts of play and intentional teaching (DEEWR, 2009, p. 5) are perhaps best realised when they are implemented in relation to particular content areas. Historical and emerging research suggests that environmental education is highly important in early childhood education (Carson, 1965; Davis, 2009; Cutter-Mackenzie & Edwards, 2006; UNESCO, 2008) and the inclusion of environmental education in the EYLF reflects this stance (DEEWR, 2009, p. 29). Early findings from this project suggests that intentional teaching and play-based learning may be framed according to the integration of the three play-types which support the acquisition of content knowledge associated with environmental education. Importantly, this suggestion aligns with research findings arguing the benefits of a bi-directional relationship between play and the curriculum, whereby educators work to develop ‘mixed or integrated pedagogies that are planned intentionally to help children learn specific skills and concepts, whilst play-generated curriculum activities can emerge for children’s spontaneous interests and activities’ (Wood, 2007, p. 130). Movement towards this form of play-based curriculum suggests potential for reducing dichotomous arguments about child-centredness versus teacher-centredness and allows for the dynamic relationship between children, teachers and content to be more effectively realised through play (Ball & Forzani, 2007; Grieshaber, 2008). Such pedagogies of play further lend themselves to an environmentalising of early childhood education curriculum.

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References


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The Swedish National Curriculum: Play and learning with fundamental values in focus


In Sweden, early childhood education is unique in its combination of learning and play, care and fostering fundamental values. The aim of this article is to discuss and problematise current Swedish research from the early childhood education field with a focus on play and learning in relation to three fundamental values affirmed in the Swedish National Curriculum. These values are children’s rights, gender equity, and education for sustainable development.

The Swedish curriculum

The Swedish National Curriculum for the Preschool determines curriculum for all early childhood settings in Sweden (Ministry of Education & Science, 2010). The Ministry of Education and Science is responsible for the educational system from preschool to university. Swedish preschools are available for children aged one–five years and are used by 82 per cent of the country’s children (National Agency for Education, 2009). All Swedish childcare settings are called preschools. There are two staff categories in Swedish preschools: preschool teachers with a university degree and day care attendants with a high school degree. The school system in Sweden is goal-based with a high degree of local government responsibility. The overall national goals are set out by the Swedish Parliament and the Government, in the Education Act (Parliament), and the Curriculum (Government), respectively. The curriculum should be seen as a framework and guidelines that give direction to the work of early childhood settings. Democracy is the foundation for all activities. The inviolability of individual freedom and integrity, the equal value of all people, equity between genders, and solidarity with the weak are values to be promoted in everyday learning. These principles are built into care and education, with learning and development going hand in hand. Children are described as individuals with competence—active children with experience, interest, knowledge, skills and competence that should be the starting point for everyday activities in early childhood settings. One significant aspect of the Swedish National Curriculum is that goals are to ‘strive for’ rather than ‘goals to achieve’ (Ministry of Education & Science, 2010). In this article, the fundamental values of children’s rights, gender equity and education for sustainability are discussed in relation to current Swedish research from the early childhood education field, with a focus on play and learning.
Play and learning

The new 2010 Swedish Preschool Curriculum emphasises the significance of play for children's development and learning. Earlier in Swedish preschools, play and learning were separated. Play had no special significance for learning. Nowadays it is acknowledged that learning takes place in early childhood settings and not only when children start school (Johansson & Pramling-Samuelsson, 2006; Pramling-Samuelsson & Asplund-Carlsson, 2008; National Agency for Education, 2008). Pramling-Samuelsson and Johansson (2006) argue that play and learning are inseparable dimensions in early childhood contexts. Sandberg and Vuorinen's (submitted) study emphasises that young children themselves make no distinction between play and learning. Schoolchildren, however, do differentiate between learning, as something that happens in the classroom, and play, which occurs during lunch breaks and perhaps in physical education classes. The idea of playful learning in the classroom may come through in children's descriptions of teachers' attitudes. A teacher who uses humour and is able to be playful with children contributes to making school learning more enjoyable. It is argued that playful learning in early childhood education can also lay the foundation for more children to succeed in school.

Research also shows strong connections between the quality of play in the preschool years and children's maturity for following school instructions (Bodrova & Leong, 2003; Malone & Tranter, 2003; Russ, 2003). These studies found that teachers achieved the best educational results when they focused on supporting children's play. Children in playful classrooms acquired literacy skills and concepts of a higher level and developed more advanced language and social skills. They also learned to manage their physical and cognitive behaviour. In classrooms where play was not incorporated, teachers had problems such as classroom management and decreased interest in reading and writing.

By supporting play without dominating or disrupting it, teachers can aid children's learning and development (Bodrova & Leong, 2003). Malone and Tranter (2003) claim that play is not only a pleasurable activity but also a process through which children learn. Play supports problem-solving abilities and creates opportunities and situations where children can experiment and be creative. Teachers in Bodrova and Leong's (2003) study reported that they held firmly to the theory that children learn through play.

Research has also been conducted into children's concepts about how teachers relate to play. In a study by Sandberg (2002), children aged five–nine years expressed a range of ideas about teachers' contributions to play; for example, solving conflicts, keeping track of the rules, giving practical and moral support, or being a substitute friend.

Making friends is a significant aspect of play for children. Friends are important, as children become conscious of themselves through others. In play, children become aware of themselves, the wider society, and their membership of groups. It contributes to the foundation of the child's moral stance and personality. Mead (1995) considers that interplay with others and taking different roles within play are foundational for children's development.

Teachers and friends have important roles when it comes to children's learning. The interaction and cooperation between them is vital for both the individual and the group's values (Mead, 1995; Pramling-Samuelsson & Asplund-Carlsson, 2008). Learning is seen as serious, and teachers now (maybe more than ever) have social pressure on them to spend more time teaching specific academic content, such as writing and reading exercises and language exercises (Bodrova & Leong, 2003).

Research concerning early learning and development has shown that, when children are supported in their play, it affects learning in positive ways (Johansson & Pramling-Samuelsson, 2006).

How do children experience play? According to a study by Vickerius and Sandberg (2006) involving children aged three to six, play has significance because it is pleasurable. In this study children said the pleasurable things about being in preschool are playing and being creative, with the most boring thing is being made to do something they do not want to, or having no-one to play with. Play as pleasure appears constantly in the literature of play (see for example Garvey, 1990). Another significance of playing with other children is that children learn to be together with others.

In interplay between children, the significance of play is to make friends. Friends are important for children, and the majority of the children in an early childhood context gain the friendship of one or more of the children in the group (Jonsdottir, 2007). In Sandberg and Vuorinen's (2006) study of 86 children aged three to 12 who were interviewed about play and learning, it was found that social skills are the focus of learning both in preschool and school. This may be because it is essential for children to learn the social rules of conduct in order to gain access to joint play with other children.
Children tend to be well aware that lacking ability to utilise the unspoken social rules within the group can lead to exclusion from the group. Younger children speak in terms of learning to abstain from mistakes, such as teasing and fighting and directly excluding someone from play. Older children talk more in terms of what characterises cooperation in play, since teamwork, joint decision making, empathy, mutuality and turn taking are described as important features when co-existing with others. Several of the children also stated that they develop their play skills by participating in play. These skills might involve the ability to maintain and develop play. As well, their social skills are mainly developed when interacting with other children. The joint play between children can thereby be seen as important from this aspect. Furthermore, the children generally tend to ascribe great importance to play with children of a similar age.

Johansson and Sandberg (2010) studied how preschool teachers and preschool student teachers perceive the concepts of learning and participation. The study shows that preschool teachers consider the concept of learning and its application correlates to the approach formulated in the preschool curriculum that learning is an interaction with others. Not many of the student teachers reflected that learning involves development of morals and values. This was somewhat unexpected because those aspects of learning are stressed in the preschool curriculum. This paper now discusses three underpinning values of the Swedish Preschool Curriculum.

**Value: Children’s rights**

The United Nations *Convention on the Rights of the Child* (1989) states that children have the right to be involved and to be heard in matters that affect them, and that education is to consider the children’s perspective, give children a voice, listen to them and take them seriously. Seeing the child as competent enough to express her or his meaning is very important in allowing mutual recognition and respect between professionals and children (Bae, 2004). The Swedish Preschool Curriculum states that the influence of the child should shape the learning environment and the planned activities in the early childhood context (Ministry of Education & Science, 2010). The purpose is to give children the opportunity to develop understandings of democracy, to take part in decision making, and to take responsibility for their own actions and the environment. In Karlsson’s study from 2009, children showed that they can take responsibility for everyday matters, both on their own behalf and on behalf of others. In some play situations, for example, children often overlook a disturbance by another child. They may also, for another child’s benefit, abstain from what they are doing.

Teachers and friends have important roles when it comes to children’s learning. The interaction and cooperation between them is vital.

Taking the child’s perspective in an early childhood setting means creating daily teaching practices that are in agreement with children’s ways of thinking and communicating (Johansson & Pramling-Samuelsson, 2003). By paying attention to children’s own ways of expressing their meaning and ideas, early childhood professionals can develop their understanding of children’s perspectives (Johansson & Pramling-Samuelsson, 2003). Nevertheless, several Swedish studies show that the possibilities of children influencing the preschool’s everyday practice are quite small (Johansson & Pramling-Samuelsson, 2003; Pramling-Samuelsson & Sheridan, 2003; Emilsson, 2007; Sandberg & Eriksson, 2008). Emilsson (2008) raises three aspects in acknowledging a child’s perspective. First, the teacher should strive for closeness to the child’s perspective by seriously trying to interpret the child’s actions and sayings; second, they should aim for emotional presence by the teacher; and third, the teacher should act with playfulness. These three aspects are supported by an action research project in 10 Swedish early childhood settings with the purpose of increasing children’s possibilities to participate and to define new methods to develop child participation in the preschool. In this study, preschool professionals participated in joint lectures, cross-setting seminars, focus group discussions and tutorials, which increased their awareness, resulting in significantly changed views about children. Preschool professionals developed skills in seeing children as capable individuals with competence to participate in decisions and to make their own choices in play and other activities (OMEP, 2010).
Listening to children’s voices can make the learning environment visible, with the practical work in early childhood settings built on interaction and communication between professionals and children (Pramling-Samuelsson & Asplund-Carlsson, 2008).

**Value: Gender perspective on play and learning**

In Sweden, discussion and legislation regarding gender equality has had a prominent place in the political arena since the 1960s. The development of early childhood education in the country was one part of an overall equality agenda that made it possible for parents to both work and have children.

As discussed earlier, all Swedish early childhood education should be in accordance with the fundamental values upon which Swedish society is based (Ministry of Education & Science, 2010). Two of these values are equality between the genders and equal rights of all people. They indicate that girls and boys should have the same opportunities to develop and explore their abilities and interests without limitations imposed by stereotyped gender roles and patterns. Accordingly, early childhood professionals should work to counteract traditional gender patterns and gender roles. But how is this perceived and handled in everyday practice in Swedish preschools?

At the end of the 1990s, the Swedish Government received indications from early childhood professionals and researchers that the work to promote equality in early childhood settings was proving to be a difficult process. Instead of challenging traditional notions of gender, early childhood professionals were actually contributing to them in many different ways. Therefore, the Government funded a gender pedagogue education program in 2002. The goal was to educate early childhood professionals with special knowledge about gender theories and to provide a variety of tools to improve quality processes. The idea was that all municipalities in Sweden should have trained gender pedagogues. At the beginning, there were just a few applicants showing interest in attending the courses, but this changed and in the last year of the program there was great interest. The Government also decided to constitute a ‘Delegation for Equality in Preschool’ in 2003. Its task was to give financial support to a range equality projects in Swedish early childhood settings. Thirty-four preschools received project funding during 2004–2005. While the Delegation was working with these projects, the first national Swedish evaluation of the preschool curriculum (National Agency for Education, 2004) showed that the work towards gender equality was barely reported among early childhood professionals and preschool directors. This started an official educational debate, the ‘General Guidelines and Comments on Quality in Preschool’ from the National Agency for Education (2005) that identified the need for a gender perspective in the everyday work of the preschools to be emphasised. ‘It is important that preschool staffs are actively working for equality between girls and boys’… ‘and discusses how the educational environment can be designed to strengthen gender equality work’ (National Agency for Education, 2005, p. 29).

In the government report from ‘The Delegation for Equality in Preschool’ (SOU 2006, p. 75) the overall conclusion was that early childhood settings in Sweden were ‘gendered’. Girls and boys were still considered and treated as different categories and the professionals were acting out stereotyped roles and patterns that maintained gender boundaries instead of improving gender equity. The knowledge gained from the 34 gender projects showed that the overall project was a useful method to improve gender equality. The conclusions from the project can be summarised as follows:

- Each professional needs to analyse her/his own understanding of gender from an early childhood education perspective.
- Different forms of documentation from a gender perspective provide a deeper understanding of daily practice.
- Each professional needs to develop knowledge about gender theories and connect these theories to preschool activities.
- They need to reflect on this knowledge in a wider context, from historical, cultural and global perspectives.
- Team meetings within preschools are needed that embrace critical reflection on practice.
- Engagement at both a local level (in the preschool) and the decision-making level (municipalities and directors) is necessary.
- Documentation in different forms, such as recording and observation through to analysis and evaluation, are needed to develop a deeper understanding of practice.
Regular development of practice by systematic quality work is required.

Teachers need to be patient, because systematic quality work must be ongoing for a long time.

Australian studies on gender in early childhood education have also highlighted the difficulties in encouraging work towards gender equality (gender equity) and non-traditional practice (Yelland, 1998; MacNaughton, 1999, 2000, 2006; Davies, 2003).

**New gender research in Sweden**

In a recent research project (Ärlemalm-Hagsér, 2010) interactions in four preschools were analysed to identify how preschool teachers work to counteract traditional gender patterns and roles, and how these were perceived and handled in everyday practice. The findings indicate that the concepts of gender patterns and roles were problematic, and that the professionals had different understandings of these concepts and how to put them into practice. As revealed in focus group interviews, a common rhetoric about improving gender equality was noticed in all four preschools. In video and audio recordings to stimulate discussion, activities and language showed gendered constructions in which both early childhood professionals and children were active. This was more or less visible in all the preschools, depending on the awareness of the staff. In one of the preschools, for example, a preschool teacher talked about mindsets and attitudes towards gender:

> I do not see the work with gender equality as a project that we are running, I think it is a mindset that we have ... it feels like you think in a different way now, more like an attitude than a project, that’s what I’m thinking (Preschool teacher).

This shows that a shared knowledge and understanding about gender structures is important within preschool teachers’ teams to construct a practice with possibilities for children to deviate from stereotyped gender norms.

In another Swedish research project, dimensions of learning and play were analysed through interactions between early childhood professionals and children, and also between children and children (Ärlemalm-Hagsér & Pramling-Samuelsson, 2009). The central finding from the analysis showed that different gender patterns appear in everyday activities. These patterns can be presented in four themes: separation, constancy, community, and breaking borders. In the first theme, separation, masculinity as a superior position is realised in different ways in everyday life in preschools. Boys, for example, get more attention from early childhood professionals than do girls. In the second theme, constancy, stereotypical gender structures are strengthened by early childhood professionals’ traditional notions of femininity and masculinity. The third theme, community, illuminates children’s care for each other, acting responsibly and helpfully. In the fourth theme, breaking borders, stereotyped gender patterns were challenged and reformulated. These four themes illuminate different constructions of gender patterns, in which both children and early childhood professionals were active in different ways. Mainly, it was the children who challenged prevailing structures, while early childhood professionals acted more within gender stereotypes. As construction of gender permeates all aspects of everyday life in Swedish preschools, listening to children’s own understandings of gender in everyday activities can shed light on hidden structures and stereotype actions that are invisible for the early childhood professionals (Ärlemalm-Hagsér, 2006).

Working with equity in preschools seems to be a gender-blind practice, as it is regarded as neutral (we don’t treat children differently) or natural (girls and boys are different). However, the children themselves displayed a wide range of positions in different situations (Ärlemalm-Hagsér, 2006, Ärlemalm-Hagsér & Pramling-Samuelsson, 2009; Eidevald, 2009).

Playing in the outdoor environment is an important part of Swedish preschool settings and it provides a range of quality experiences (Ärlemalm-Hagsér, 2006), but it is not gender-neutral. Ånggårds (2009) study about children’s play in natural settings such as a forest shows that children’s different play themes are, to a large degree, gender stereotyped. However, the outdoor environment gives potential for more equal play, as a natural environment and nature materials are seldom pervaded with views of girlish or boyish qualities for the children. Sandbergs and Vuorinen’s (2006) study with girls aged three to 12 showed that play is also more dependent on weather. The majority of the children in this study preferred outdoor play when it was warm outside or when there was snow. Preschool girls showed a preference for indoor play, but older girls prefer to play in the forest.

Preschool teachers also showed differences between female and male preschool teachers’ willingness to play: if they want to participate in children’s play or choose not
to participate. It also refers to gender-oriented play (play for boys versus play for girls) and also physical play versus calm play. In this study, male preschool teachers were more prepared to engage in physical play. This emerged from experiences from their own childhood. Female preschool teachers tended to prioritise calm play, which they also experienced in their own childhood. Both female and male preschool teachers in the study emphasised the importance of creating inspiring environments for play (Sandberg & Pramling-Samuelsson, 2005).

Playing in the outdoor environment is an important part of Swedish preschool settings and it provides a range of quality experiences.

**Value: Learning for sustainable development**

The last perspective related to play and learning in Swedish preschools is learning for sustainable development (learning for sustainability, as it is called in Australia). In Swedish preschools, environmental education has been an important part of the preschool program since the document *Pedagogical Programme for the Preschool* was adopted in 1987. The intentions were, and remain, to foster the children's environmental awareness and promote an environmentally friendly approach (Ministry of Education and Science, 2010). Studies in learning for sustainability are rather few in the international research field of early childhood education (Pramling-Samuelsson & Kaga, 2008; Davis, 2009). The same tendency is shown in the Swedish Early Childhood Educational research field (Hägglund & Pramling-Samuelsson, 2009).

Nevertheless, in one Swedish evaluation study, Arlemalm-Hagsér (2003) interviewed Swedish preschool teachers about issues relating to the environment and the nature directive in the national curriculum. The results showed that the teachers understand the preschool directives in three different ways. The first was the concrete perspective, where the teacher focused on children’s observable behaviours towards nature. The second was the wider perspective, where the teacher recognised herself/himself as a role model, as well as teaching children about environmental issues. Third, in the holistic perspective, preschool teachers explained that they used children’s questions as a basis for their activities, from global to local issues. The majority of the preschool teachers expressed the wider perspective.

Another study related to education for sustainable development explored day care attendants’ comprehension of the concept of sustainable development. In this study, Arlemalm-Hagsér and Sandberg (in press) showed that the day care attendants are now more comfortable with the directives in the Swedish National Curriculum than in the past, and try to work and plan activities in accordance with the preschool curriculum and from a child-centred perspective. The participants defined the concepts of sustainable development as conscious thinking and attitudes, and were viewed from three perspectives: as a holistic concept, just as an environmental concern, or as an issue of democracy. These different approaches created different attitudes and day-to-day practices in the preschools’ pedagogical programme. Almost all participants said preschools are characterised by an environment where questions about values, morals, human rights, democracy, participation and a relationship with nature are only lightly touched upon. However, these day care attendants pointed out that they were working to improve learning for sustainable development within their settings. In a recent article, Johansson (2009) raises questions about the idea of world citizens as an important content in the Swedish National Preschool Curriculum and the moral dimensions in learning for sustainable development. She highlights the need for more research on how moral and democratic values are treated in the Swedish preschools interconnected with the ideas of globalization (p. 91).

**Discussion**

Play has traditionally been tied to the school as a way of developing subjects such as maths, reading and writing. Learning has been mainly associated with adult-guided activities. Today, Swedish early childhood education is more influenced by a sociocultural perspective with a child-centred orientation that considers children as competent and active. The most noticeable quality of the Swedish curriculum is that the child is described as an active child.
and that children’s experience, knowledge, skills and competence are important as starting points of everyday activities in the early childhood settings.

In Sweden, early childhood education is unique in its combination of learning and play, education, care, and fostering such fundamental values as gender equality and equity. Children’s play can be seen as uncomplicated and simple, but play affects children’s development and learning (see for example, Vygotsky, 1978). It is important to use all opportunities for learning that exist in play. Flow is relevant to the link between play and learning (Csíkszentmihálhyi, 1992; Csíkszentmihálhyi, 1999; Sandberg, 2003).

Today, play has started to receive more attention in the context of learning, emphasising and focusing learning in play. This effect of play is emphasised in the Swedish National Curriculum (Ministry of Education & Science, 2010). As a result, the evaluation by the National Agency for Education (2008) showed that the National Swedish Curriculum for Preschool potentially has a strong impact on preschool professionals in giving support for everyday play and learning activities in early childhood settings. The conclusion is that the National Curriculum has impact on the education of young children in Sweden because it shapes professionals’ learning experiences, which changes how they go about preschool activity. For professionals, the national curriculum is also a tool for communication with parents. Therefore, we argue that spreading knowledge on how the national curriculum can contribute to opening up new perspectives and changes in pedagogical activities is of educational importance, in both Sweden and internationally.

To sum up, Swedish research about fundamental values in preschool contexts has improved in the past decade. These empirical studies are influenced by the Swedish historical, cultural and pedagogical context, and cannot easily be generalised to a global context. However, results from the studies cited in this article have implications for praxis and theory both in Sweden and other countries, as they increase knowledge and understanding of play and learning, children’s rights, gender equity, and education for sustainability. These are matters of great importance, and more research needs to be undertaken, since children need to begin to develop skills and competencies in preschool for handling issues such as equal rights, sustainability and democracy.

However, we never know what kind of knowledge children need to develop in changing, uncertain times such as these. And we always need to carefully consider the multitude of early childhood education contexts across the world and not think that a universal solution can be the answer. However, we know that democracy and gender equality are not to be taken for granted anywhere and are lifelong processes. We also know that environmental issues must be treated with great seriousness for the fulfilment of human needs and the survival of the Earth. The foundation needs to be laid in early childhood, and the importance of children as stakeholders (Barratt-Hacking, Hacking & Scott, 2007), active participants and responsible partners needs to be recognised, in both local and global issues in the present day and in the future.

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The next 20 years: imagining and re-imagining sustainability, environment and education in early childhood education

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The concluding paper of this *Best of Sustainability* publication in many ways represents the end of the beginning. The last twenty years have seen dedicated efforts to mainstream sustainability and environment in early childhood education. Whilst in many respects sustainability and environment are now firm constructs in early childhood education, the field is at a nascent stage with respect to engaging with both early childhood educational research and environmental education research (and the multitude of theoretical perspectives encapsulated within each field). This paper provokes discussion and debate, acting as a prelude to the next twenty years in imagining or re-imagining environmental education and sustainability in early childhood education.

Introduction

Drawing on ideas articulated in this collection, the opening paper in this *Best of Sustainability* publication sought to capture insights about environmental education and education for sustainability in early childhood education from a historical perspective. What we learned was that sustainability and environment is increasingly understood as mattering to early years’ education. Environment and sustainability (and associated education) now has a presence in early childhood education, and as evidenced in a range of international curricula is a nominated content area or learning outcome for many young children. *Belonging, Being and Becoming, the Early Years Learning Framework* (EYLF) for Australia (DEEWR, 2009), includes sustainability and environment as a sub-outcome of Learning Outcome 2: Children are connected with and contribute to their world (p. 29).

Sustainability and environment is also recognised as a standard within the Australian *National Quality Standards* for early childhood education services. For example, Quality Area 3, Physical Environment, (Standard 3.3) states ‘The service takes an active role in caring for its environment and contributes to a sustainable future’ (ACECQA, 2011, p. 104). In Sweden, sustainability in particular, is considered a ‘way of living’ with which children and educators engage as part of participating in a democratic community (Sandberg & Årlemalm-Hagsér, 2011). The Aotearoa New Zealand *Te Whariki* early childhood curriculum guidelines (Ministry of Education, 2003), include reference to children’s learning about the environment and the natural world (p. 90). Whilst in the USA, the National Association for the Education of Young Children’s *Developmentally Appropriate Practice Guidelines: A Position Statement* (NAEYC, 2009) suggests that children’s play experiences with nature are an important
aspect of learning about the environment. Internationally, the literature also increasingly emphasises the importance of sustainability in early childhood education in terms of meeting policy directives associated with identifying education as a driving force for addressing global challenges such as global warming and climate change (Hägglund, & Pramling Samuelsson, 2009; UNESCO, 2008). In addition, there is an increased focus on the relationship between sustainability and environment in early childhood education as a learning area and the role of outdoor play in such learning (Waller, et al., 2010).

**Sustainability and environmental education in early childhood education**

As the papers in this collection suggest, sustainability and environment clearly have a presence in early childhood education. In 1984 Walsh was writing about how to integrate content knowledge regarding biodiversity into the early childhood curriculum via teachers’ knowledge bases. In 2007, Young was alerting educators about how to best engage young children in learning about climate change, whilst in 2008 Tarr was researching the arts as a pedagogical vehicle for young children learning about life cycles, growth and habitats. By 2011 integrated perspectives on play-based learning and engaging with environmental education (and knowledge associated with sustainability in particular) were being proposed by Edwards and Cutter-Mackenzie. This presence, or the mainstreaming of sustainability and environment is due in part to the promotion of education for sustainability and environmental education in the early years by committed scholars and educators during the last twenty years (see for example Davis, Gibson, Pratt, Eglington & Rowntree, 2005; Elliott & Emmett, 1997 Davis & Elliott, 2003; Siraj-Blatchford, 2009), coupled with an increased awareness regarding environmental issues in the broader community. Thus, in early childhood, education for sustainability and environment (and associated education) is understood to represent an important and viable aspect of the curriculum. However, from a research perspective, the position of sustainability in early childhood education remains what Elliott and Davis termed in the opening paper of this collection as somewhat tardy. Here, as in Davis’ (2009) paper, where she characterised research focused on education for sustainability as a ‘black hole’, there is concern for the extent to which the field has engaged with not only the practical issues associated with sustainability in early childhood education, but also the range of theoretical, philosophical and methodological options available for continuing to grow this small research area.

One important philosophical and theoretical case in point is the range of understandings in the field associated with the research and practice of environmental education. As Elliott and Davis indicated in the opening, the historical use of the term education for sustainability in early childhood derived from key UNESCO (1997, 2002) policy directives positioning education for sustainable development as preferable to environmental education. There has been some preference for education for sustainability in Australia and New Zealand particularly at a policy level (Gough, 1997, 2011; Tasar, 2010). However, historical discussion in environmental education and its research literature considers a range of perspectives associated with environmental education. In particular, fierce debate surrounds the very notion of sustainability and respective educational positions such as education for sustainability (Fien 2000; Jickling & Wals, 2008; Knapp, 2000; Selby, 2009). For example, Sauvé (2005) identifies fifteen orientations to environmental education (of which education for sustainability is one), arguing that:

*An overview of the literature in the field of environmental education shows that, despite their shared concern for the environment and their recognition of the central role of education in enhancing human-environment relationships, various authors (researchers, professors, educators, facilitators, associations, organisations, etc.) adopt widely differing discourses on environmental education, and propose diverse ways of practicing educative activity in this field* (p. 11).

Further, Sauvé (2005) divides these fifteen orientations or ‘currents’ into two broad categories, including those with a longer tradition in environmental education (naturalist, conservationist, problem-solving, systemic, scientific, humanist and value centred); and those more recently emerging (holistic, bioregionalist, praxic, socially critical, feminist, ethnographic, eco-education, sustainability). These currents and their associated ideological positions are not necessarily familiar to educators and researchers working in early childhood education where the notion of sustainability (i.e. education for sustainability) has been particularly strong and opportunities to engage with alternative perspectives has been limited by the tardy or nascent nature of the early childhood sustainability and environmental education research agenda. However, the currents do suggest a means of growing the field, because as early childhood education has increasingly recognised over the last decade, working with multiplicity has potential for addressing complex research problems—particularly those associated with working with young children and families in relation to environmental and sustainability concerns.
Multiplicities in early childhood education

During the early part of the twenty-first century early childhood education moved into a multi-perspectival space. Curriculum debates, teaching and learning concerns, gender and equity research and play-based scholarship increasingly drew on multiple theoretical ideas and research methodologies for understanding young children’s learning, development, play and socio-cultural participation in their communities (Brooker & Edwards, 2010). This shift from a predominately modernist and developmentally informed approach to understanding early childhood education is evidenced by recent textbooks for pre-service educators that canvas and explain the multiple theoretical perspectives now informing early childhood education. For example, the well-used Australian text by Arthur Beecher, Death, Dockett & Farmer (2012) now lists ecological theory, sociocultural theory, postmodernism, poststructuralism, the sociology of childhood and the re-conceptualist literature as informants for thinking about young children’s learning, development, play and social experiences. In the United Kingdom, Wood’s (2013) most recent work on play in the early childhood curriculum likewise references multiple theoretical perspectives as important avenues for thinking about and understanding young children’s play. In Europe, researchers are integrating philosophical orientations towards understanding the social world with theoretical explanations for children’s learning and development to derive new approaches to teaching and learning (Hakkarainen, 2008; Pramling-Samuelsson & Asplund Carlsson, 2008). Meanwhile, new early childhood research journals such as the International Journal of Play (Broadhead, Factor & Patte, 2012) and Global Studies of Childhood (Yelland & Saltmarsh, 2011) actively promote theoretical multiplicity.

From a curriculum perspective the turn to multiplicity was expressed in Belonging, Being Becoming: The Early Years Learning Framework for Australia (EYLF) (DEEWR, 2009) by the suggestion that educators could draw on multiple theoretical frameworks to inform their work (Nuttall & Edwards, 2013). Developmental, sociocultural, socio-behaviourist, critical and post-structuralist theories were listed as potential informants to educator practice. It was later argued by one of the EYLF authors [Sumsion] that the use of multiple theoretical perspectives in the document was a deliberate attempt to engage with the complex social, cultural, economic, environmental and geographic diversities constituting the life experiences of young Australian children in order to support and promote opportunities for social equity (Milleli & Sumsion, 2011). In other words, it was considered that using only one theoretical framework would not necessarily enable a worldview that would meet the diverse contexts and experiences of all children. Thus, value was attributed to supporting educators to engage with and use multiple theoretical perspectives so that theory could be used as a starting point for discussion, reflection and the development of socially-situated practice. The framework was intentionally constructed to provide ‘a catalyst for reflection, dialogue, critique, debate and discussion without advocating or assuming adherence to any one theoretical stance’ (Sumsion, et al., 2009, p. 10).

Multiplicities, education for sustainability and environmental education in early childhood

The early childhood research community increasingly accepts that multiple perspectives are now used for understanding children’s play and learning (Wood, 2012). This is an important shift for the field as it means that research is open to using different ideas as a basis for engaging with the range of challenges that may be associated with the practice of early education itself. Now that sustainability and environment has an acknowledged presence in early childhood education, the time may be ripe for using the multiplicity platform (Brooker & Edwards, 2010) currently informing early childhood education scholarship as a basis for expanding the field of early childhood environmental/sustainability education. In other words, given the history of discussion associated with the use of various theoretical perspectives to inform thinking about what constitutes education in each sector, it may be possible to bring awareness about the multiplicity of perspectives informing sustainability and environmental education into the research space in early years education that currently accepts multiplicity as a strength for promoting reflection, dialogue and debate. Davis (2009) touched on this need some years ago when she suggested:

As the field of early childhood education for sustainability is so new, opportunities exist not only to replicate the kinds of studies already evident in other parts of the education for sustainability field, but also to make the most of innovative and contemporary research methodologies, mixed method approaches and cross-disciplinary research partnerships (p. 238).
In this way, early childhood sustainability and environmental education research is open to further opportunities for growth because more than one theoretical stance can be used to investigate research question that challenge the field. As the problems confronting the world in terms of managing population growth, climate change and the need for sustainable models of economic participation grow, the field will need increasingly sophisticated ways of approaching the complexity of these issues to develop research informed approaches to pedagogy that enable children’s participation in their current and future communities.

An example of this possible interlinking across early childhood and environmental education theoretical orientations is suggested by Elliott and Davis in the opening paper in this publication. Here, the wider impact of early childhood education for sustainability initiatives on children’s local communities was identified as a significant future research issue. Likewise, the impact of children’s engagements with digital technologies in relation to their experiences of the natural world was identified as an important future research area (see also Cutter-Mackenzie, Edwards, Moore & Boyd, forthcoming; Lloyd, 2010). In each of these areas there is potential to work with differing theoretical perspectives on environmental education so that the wider impact of sustainability and environment on children’s local communities may be investigated from a systemic perspective, whilst an investigation into the relationship between children’s digital and nature-based experiences may be more adequately framed using a socio-ecological (or social ecology) theoretical orientation (see Wattchow et al, 2011).

Interestingly, this interlinked approach to early childhood sustainability and environmental education research creates opportunities for thinking about the extent to which environmental education research may cross-fertilise with existing theoretical perspectives in early childhood education. Elliott and Davis noted earlier that the sustainability current may be usefully informed by existing uses of post-humanism in early childhood education as a basis for understanding the relationships between children and their ecological interactions, including with living and non-living ‘other-than-human’ beings and objects. Here the intersection between post-humanism as a perspective informing theorisation with respect to children’s play may in fact be of use when researching how best to promote children’s respect for the life needs of the non-human beings with whom they come in contact via their local environments. Thus, there is potential for enabling the perspectives from the two fields of education to inform each other so that sustainability and environment research in early childhood education is able to create new understandings and approaches for responding to contemporary research questions.

The opportunity to use these ‘synergies of change’ (Elliott, 2011, p. 6) are perhaps best captured by realising that for both early childhood and sustainability/environmental education there is no single right way to conduct research, and that the practice of working and researching with young children cannot be limited by ‘adherence to any one theoretical stance’ (Sumsion, et al., 2009, p. 10). This is not to say that knowing and working in a theoretical tradition is not of value, as clearly mastery of a theoretical body of knowledge assists in the generation of new insights and ideas. Rather, the idea here is to consider the extent to which the early childhood sustainability and environment research field should seek to develop consensus as a way of moving beyond being tardy, compared to the possibilities for growth enabled by a research field in which multiple perspectives are brought to bear on understanding questions, problems, issues and dilemmas. Selby (2009) reflected on this matter in relation to the multiple theoretical orientations informing environmental education dialogue:

There was a large clearing in the forest, a large open area from which many footpaths led off in many directions. The people were disputatious. Some argued the merits of taking one footpath, some the merits of taking another, and yet others the merits of taking a third. They milled around in confused and contentious mood. Then they discovered what looked like a broad form and easy path that all might take, where all kinds of folk could walk together shoulder to shoulder. Many hurried towards it, relieved that their arguments could be brought to an end. In a sigh of collective relief, few were disposed to enquire whether the path was really heading in the right direction and whether the undemanding way it seemed to offer might discourage the further seeking and exploration of alternative pathways. Even fewer bothered to ask whether going down the path would really be good for the forest and its inhabitants (Selby, 2009, pp. 199–200).

In this example, Selby highlights that while consensus might be comfortable, it does not necessarily ensure a way forward that addresses educational and research needs.
In early childhood education, the main path with which we have become familiar revolves around conceptions of sustainability and education for sustainability. As we have noted, current pathways have played an important role in getting sustainability and environment into early childhood curricula. However, growing the research field is now more likely to involve further exploration of other paths—or what Sauvè (2005) identified as the many different currents of theoretical and philosophical work informing debates in environmental education.

**Conclusion**

Elliott and Davis (2013) opened this special issue by reflecting on the historical development of sustainability and environment in early childhood education. They described the efforts undertaken to embed sustainability and environment into the early childhood curriculum, and reflected on the extent to which research in this area requires continued commitment and energy to move forward. In doing so, they suggested ‘we can only imagine what might be achieved in the next twenty years’ (p. 9). Their thoughts remind us that early childhood education is at an important juncture in terms of relating to environmental education and its currents (with sustainability being of particular significance). Similar parallels can be seen in the wider field of environmental education with its research and calls to reinvent the field. In the broader arena of environmental education Orr (2013) recently asked ‘Can we see past what we imagine?’ (n.p.) In early childhood sustainability and environment research, this call likewise echoes for us as we head into the next twenty years. It is possible that instead of seeking the consensus of one path or adhering to one theoretical stance that the field will be invigorated by an imagining that explores the possibilities that are enabled by interlinking theoretical perspectives across early childhood education and environmental education so as to learn more about young children’s learning, play, sustainability and the environment. The next twenty years are indeed full of possibilities.

**References**


References


Australian early childhood education for sustainability organisations

Australian Association for Environmental Education Early Childhood Special Interest Group (AAEE EC SIG)
www.aaee.org.au

Environmental Education in Early Childhood (EEEC Victoria)
www.eeec.org.au

New South Wales Early Childhood Environmental Education Network (NSW ECEEN)
www.eceen.org.au

Queensland Early Childhood Sustainability Network (QECSN)
www.qecsn.org.au