The Living Curriculum: A Natural Wonder

Enhancing the Ways in Which Early Childhood Educators Scaffold Young Children's Learning About the Environment by Using Self-Generated Creative Arts Experiences as a Core Component of the Early Childhood Program

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Dedication

This thesis is dedicated to all early childhood educators
who are willing to take the plunge and challenge themselves
to connect with their natural environment
and
develop their own creative resources
to use in their programs with children.

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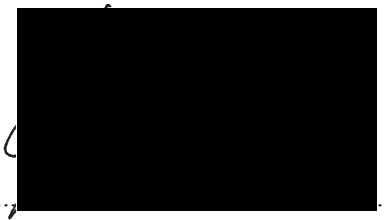
This thesis would not have been possible without the ongoing assistance of Associate Professor Meg Smith and Dr Leonie Arthur. Their patience and encouragement were key ingredients in supporting me particularly in the final stages.

My thanks also go to my husband Simon, who enabled me to opt out of domestic life so I could focus on this work.

Statement of Authentication

The work presented in this thesis is, to the best of my knowledge and belief, original except as acknowledged in the text. I hereby declare that I have not submitted this material, either in full or in part, for a degree at this or any other institution. ©



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Movie Clips

Audio Clips of Songs & Verses

Abbreviations

• ACARA	Australian Curriculum, Assessment and Reporting Authority
• ECA	Early Childhood Australia
• ECE	Early Childhood Education
• ECEC	Early Childhood Education and Care
• ECEEN	Early Childhood Environmental Education Network
• DEEWR	Department of Education, Employment and Workplace Relations
• DESD	Decade of Education for Sustainable Development (2005-2014) The United Nations
• MCEETYA	The Ministerial Council on Education, Employment, Training and Youth Affairs
• NACC	Nature Action Collaborative for Children
• NCAC	National Childcare Accreditation Council

Abstract

The natural environment is in focus as never before in human history. Concerns about exploitation of the planet's resources and the need for sustainability in all aspects of human endeavour are daily features of news and current affairs programs and of syllabi in education settings for children of all ages.

This research project draws on the principles of ecopsychology, deep ecology, ecofeminism and biophillia. It is predicated on the view that in order to interact with the natural world in a sustainable and meaningful way, we have to develop a connection with the natural world that speaks to all domins of our human makeup, and that includes the cognitive, psychological, affective and physical. This is necessary in order for us to integrate sustainable interactions as an everyday, constructive way of living.

This thesis reports on collaborative, action research studies implemented throughout 2009, and demonstrates the value of positive, creative programs infused with content about the natural world and based on the arts, in assisting early childhood educators and 3 to 5 year old children to develop a greater understanding of, and connection with, their local natural environment. It highlights this approach as an important and innovative way of developing educational curricula for young children in its own right, and attempts to provide a pedagogical alternative to what are often fear-based messages in environmental education that can negatively affect children's abilities to connect with the natural world. The creative, arts based pedagogy used throughout the study is also a positive motivational model and brings into focus the wonder-filled reality that we are part of what makes up our planet, not separate to it.

Monthly field visits were conducted in four early childhood sites throughout the academic year of 2009. During this time the researcher modelled and conducted self developed creative arts experiences for the educators and the children. These experiences were newly created for each visit in collaboration with the educators in the settings, and were based on the local natural flora and fauna and the interests of the children. The natural environment was the basis for new stories, songs, verses, drawings, paintings, sculpture, and music and drama experiences. As the year progressed, the educators gradually took on the role of researcher and transformed the outcomes of their research into their local natural environments, into the types of creative experiences listed above. They experimented with their emerging environmental/creative awareness by writing songs, stories, and verses that focused on the natural world. The content of these self-generated artefacts became the basis for drama and visual arts experiences that reflected the natural environment. This thesis also reports on the effect this had on the way in which the educators viewed the natural world, the programs they presented to the children, and the effect this had on the children.

Chapter 1:
A Different Way of Knowing

Introduction

The natural environment worldwide is under scrutiny as never before. Concern about the impact that human development has on our ecosystems across the planet has prompted world leaders to discuss and consider new legislation governing industry, automotive transport, housing and education (DesJardins 2006; Department of Climate Change and Energy Efficiency 2010; Young, Ellen & McGown 2010). Environmental science is offered as a course in its own right in Vocational Education and Higher Education institutions. Environmental education is also now part of all school curricula in Australia in some form, whether it be embedded in social or natural sciences or on its own as a primary subject (Department of Environment and Heritage 2005). The Melbourne Declaration on Education Goals for Young Australians (MCEETYA 2008) recognises the need for learners to be active and informed citizens in relation to their natural environment and promotes the importance of environmental sustainability in a national curriculum.

In Australia, in the draft National Curriculum K-10, sustainability is a cross curriculum perspective for English, mathematics, science and history (ACARA 2010). Early childhood educators have also become part of the campaign to teach children to live sustainably and to minimise environmental damage. Sustainability is now part of the strategic plan for the Australian peak body for early childhood education, Early Childhood Australia (ECA). Environmental awarenes is also a thread of the the *Early Years Learning Framework* (DEEWR 2009) .Many other Australian and international groups also advocate sustainability education for young children and their efforts have consolidated into advocacy or teaching organisations. They include but are not limited to the Early Childhood Environmental Education Network (ECEEN) in Australia and the international Nature Action Collaborative for Children (NACC) based in the United States of America.

The overall thrust of these environmental education and awareness initiatives is to minimise the adverse impact on the biosphere, to reverse some of the damage caused, and to preserve the environment in a sustainable condition for future generations by educating for environmental stewardship (Evans & Boyden 1970; Davis & Elliott 2003; Department of Environment and Heritage 2005; MCEETYA 2008; ACARA 2010). While these are admirable and necessary aims, particularly when considering the immediate crisis of climate change, the very fact that they are deemed necessary indicates a broad disconnection between mankind and nature that needs to be better understood in order for long standing, sustainable ways of living to be developed and accepted

broadly by the community (Seed, Macy, Fleming & Naess 1988; Roszak 1992; Cohen 2000). This connection (or disconnection) with the natural world begins in childhood (Chawla 2007) and has direct implications for environmental education.

My aim in this research project was to introduce and assess a new paradigm for implementing environmental education in early childhood settings. The project asks questions about the extent to which early childhood educators consider that using self-generated creative arts experiences, in a variety of media, are effective in conveying content about the natural world. It also asks questions about the effects this approach has on the children. To answer these questions the project involved educators implementing content about the natural world regularly in their early childhood programs though arts based pedagogies. However, for the educators to incorporate meaningful environmental education into their programs, they needed to develop their own understanding of, or connection with, the environment before they could effectively support children in developing the same (Hyun 2005; Tarr 2006; Davis & Ferreira 2009).

Whilst there have been moves toward understanding the environment in schools for all age groups, the underlying message has been 'fix it or we are doomed'. This can and does, according to Joanna Macy (1995), have an overwhelming effect on all people, let alone children and young people, to the extent that they can become incapable of acting because of the enormity of the problem and heavy sense of responsibility in dealing with it (Macy & Brown 1998; Chawla 2007). This is also problematic in early childhood education as young children are particularly sensitive to negative messages (Prohansky & Fabian 1987; Greenman 1988; Bartlett 1993; Macy 1995; Olds 1998; Ashton & Laura 2003; Davis & Elliott 2003; DesJardins 2006). Sue Elliot (2003) highlights the need for a holistic approach to environmental education in early childhood settings in Australia, indicating that while there are many approaches to environmental education within these settings, and a small number of exemplary practitioners, many have a narrow focus in one or other area of the curriculum or centre operations.

Encouraging an awareness of the natural environment that imbues a sense of appreciation, respect and a gradual understanding of constructive co-existence means using a positive approach that is physically, emotionally and psychologically engaging (Macy & Brown 1998; White 2004; White & Stoecklin 2008). It is important, particularly for young children, that this approach is not filtered through a lens of fear of lowering living standards or of the planet becoming unlivable, or one that contains a message of 'we are doomed if we don't'. Nor will this awareness be achieved through atomised and/or narrowly focused experiences in environmental education (Hyun 2005; Chawla 2007; Kennelly, Taylor & Jenkins 2008). As Randy White (2004) puts it:

'We need to allow children to develop their biophilia, their love for the earth, before we ask them to save it' (p. 4). Much of White's work, and that of many other advocates for helping children to experience the natural world, is based on providing primary experiences in nature or natural settings. While I acknowledge that this is essential and the primary experience of being in nature cannot be substituted, there is much that can be done to assist children to develop a connection with the natural world in a childcare setting. By connection, I mean knowledge of and curiosity about their local flora and fauna, a sense of awe, wonder or fascination, and respect for the complexity and interrelationships in the environment. I also mean love for the natural world, an understanding that we are part of nature, and a sense of belonging in place.

Assisting early childhood educators in developing positive and holistic methods of scaffolding young children's connection with the natural world, using self-generated creative arts experiences, is the focus of this research. This is based on the premise that helping children to know and connect with their local natural environment through creative, engaging, non-didactic, meaningful program components, complements their experiences prior to or after direct experiences in the outdoors, and assists them to understand the connections and relationships within them (Adcock & Ballantyne 2007; Ballantyne & Packer 2009; Tooth & Renshaw 2009).

The following questions underpin this research:

Research Question 1:

In what ways can self-generated creative arts experiences assist early childhood educators to support young children to learn about the environment?

- Does working through the arts assist educators to incorporate information about the natural world into the program for the children?

- In what way will the educators' research on flora, fauna and natural phenomena, and their subsequent development of creative experiences for the children, affect the educators' understandings of/ or attitudes toward the environment?

- In what way does working through the arts to develop experiences about the natural world or the environment for the children, affect the educators' sense of connection with their local environment?

Research Question 2:

What are the benefits for children of experiencing creatively presented material about the natural world as regular content in the early childhood program?

- Are there changes in the ways in which the children express their understandings about the environment after a period of using creative arts experiences to support learning about the environment?

- Are there changes to the way in which the children behave toward the natural world or environment?

- Are there any differences in the interactions between the children that can be attributed to the regular experiences of creatively presented information about the natural environment?

This thesis documents the journey taken by four educators in four separate preschools (3 to 5 year olds), who already had a commitment to environmental education, in a researcher facilitated action research process (Ponte, Ax, Beijaard & Wubbels 2004). The aim was to explore new techniques to assist the educators in developing and implementing creatively based experiences into their programs to assist the children to learn about and deepen their understanding of and connection to the natural environment.

Rationale and definitions

Why early childhood?

Environmental education has become a common feature of curricula for all age groups in Australia. Whilst the focus on the environmental content and the extent to which it is incorporated into the curriculum in individual schools, preschools and childcare settings varies, it is generally understood that the complexity of the message or content needs to be made accessible to the age group for whom it is intended (Cutter-Mackenzie & Edwards 2006; Chawla 2007; Hicks & Olden 2007; White & Stoecklin 2008). Early childhood, commonly referred to as birth to eight years old, is known to be a critical time in the development of attitudes and behaviours (Dockett 1995; Elliott 1995; Cutter-Mackenzie & Edwards 2006; Fleer, Edwards, Hammer, Kennedy, Ridgway, Robbins & Suman 2006), yet there is relatively little focus on the type of environmental education that is appropriate for this age group and even less on the practices of early childhood educators who implement it. Davis (2009) refers to this as 'the research hole

of early childhood education for sustainability' (p. 3). It is known that the approaches to environmental education in the early childhood sector are for the most part ad hoc or narrow in focus (Davis & Elliott 2003; Elliot 2003).

Another factor underpinning this research is the extent to which children's lives have become de-naturised (Louv 2006). Children's discretionary time is often structured and indoors, leaving little time for engagement in outdoor activity or exposure to the elements or the natural environment (White 2004; Louv 2006; Gill 2007; Malone 2007). This has broad-reaching ramifications for understanding the environment or local community as well as for health and fitness (Phenice & Griffore 2003).

An additional area of concern is that of the 'extinction of experience' (Pyle 1998; 2002; 2007). Robert Pyle, a lepidopterist and early activist in environmental issues, expresses cogent concerns about the diminishing level of environmental awareness through the generations and the subsequent level of expectation about the provenance and integrity of natural sites. Each successive generation, he says, has an exponentially diminished understanding about what constitutes a wild space, as their experience of it is comparatively limited (compared to the earlier generations), and they are satisfied with less than their predecessors would be. Through this thesis, I am proposing that holistic, creative and engaging experiences based on the natural world may help young children to develop understandings about their environment or natural world, and the related associations and relationships that make up micro environments or interdependent microsystems. This everyday exposure through creative experiences in the early childhood program may assist children to develop metacognitive understandings that assist with their connection with the natural world and their ability to live sustainably within it.

Environmental education

The word environment caries a wide variety of meanings that are dependent on context. For an environmental activist like Al Gore (Guggenheim 2006), it can encompass the whole biosphere of the earth. For members of a municipal council environmental management group, it is more likely to be the local area for which they are responsible for maintaining or regenerating (Huges 2007). For young Australian children, there are a variety of words that may be used to encapsulate what they see as the environment including nature, the bush, the outback and the forest. While the terminology may vary, research is gradually confirming that young children's perceptions of the environment begin locally and broaden, geographically speaking, as they grow older and their cognitive and affective capacities develop (Hyun 2005; Chawla 2007).

Children have their own perceptions of the natural world or environment and these are socially constructed (Cutter-Mackenzie & Edwards 2006; Fleer et al. 2006). The definition of the terms 'the environment' or 'natural world' for the purposes of this project means the educators' and/or the children's local natural environment and aspects of it within the built environment. As the educators will be drawing on the children's understandings of the environment for developing their environmental education programs, it includes the natural spaces and places or environments into which the children go when at home, at preschool and in the local community with their families. This may include the garden at home, the nature strip or the preschool setting, the local park or the beach. It may also include excursions to the country, a farm or a national park. Children also experience elements of the natural world in the built environment. They may see ants or spiders on a wall, birds perched on a power pole, or seagulls under the outdoor tables of a café.

A beginning point for the educators in this study was to gain an understanding of the children's individual perceptions of the natural world or environment through applying the observation and recording techniques commonly used in early childhood environments (see Chapter 4). Effectively, the natural world or environment in this context includes any insect, animal or plant and any micro or macro setting that has significant elements of these. The educators were encouraged to differentiate between the various environments and elements of the natural world, and to understand the features of the habitats that are supportive of the plant, animal and insect species through research. Armed with the factual information, they were assisted to creatively transform the information about their research topic for inclusion in their programs with the children.

Creative arts experiences

In early childhood settings, art experiences such as painting, collage, sculpture, drawing, drama, dance and music are common. Indeed, including these elements into the program is required by Australian Accreditation standards (National Childcare Accreditation Council 2005). It is also widely recognised that these experiences are instrumental in assisting children to develop socially, cognitively, emotionally and physically and in representing their understandings of the world (A'Beckett 1991; Isenberg & Jalongo 1993; Kolbe 2001; Wright 2003; Arapaki & Zafrana 2004; Kolbe 2005; Arthur, Beecher, Death, Dockett & Farmer 2008).

While there is limited research about the arts and the way in which they can assist children in developing environmental understandings and/or behaviours, what does exist is mostly related to children of primary or high school age (Adcock &

Ballantyne 2007; Tooth & Renshaw 2009). Tooth and Renshaw highlight the value of environmental narrative, drama and deep reflection, in conjunction with in situ experiences, for developing meaning and connection for school children and thus contributing to a 'pedagogy of place' (p. 101).

> *Our research suggests that a focus on ''environmental narrative pedagogy'', with its mix of story, drama and attentiveness, and its ability to connect students and teachers to nature in deeply sensorial ways, is a particularly effective way of giving students a deep understanding of sustainability as part of a new eco-centric way of thinking and valuing (p. 102).*

Curtis' (2007) research with primary school children has highlighted the ways in which participation in the arts can change attitudes and environmental behaviour and shows that being a participant is more likely to effect these changes than being a passive spectator. Eva Alerby (2000) clearly demonstrates how children's thoughts and understandings about the environment can be gleaned through drawing. However, her research is aimed specifically at interpreting the meaning of young children's/people's thoughts when reflecting on the environment rather than on reporting on changes to knowledge, attitudes or behaviour.

Crystal-Helen Feral (1999), a psychologist, as part of an exploration of ecopsychology (Roszak 1992), observed that children's distress was heightened when exposed to environmental education that focused on the degradation in nature and the ongoing environmental challenges. She discusses the 'learned helplessness' (Seligman, 1975) that comes from having no control over a set of circumstances, and the paralysis and withdrawal that results. Feral developed a model program whereby primary school aged children, at emotional risk, received an alternative environmental education program. They were supported through a combination of experiences in the natural world and sessions that highlighted the connectedness between man and nature in native American stories, music and art. The outcomes show that the children's self esteem and happiness improved, and their educational status, emotional development, capacity to empathise, perceptual skills and sense of self-efficacy were also enhanced. The results also showed a significant reduction in aggression.

There is a lack of research on the role of the arts in environmental education. Davis (2009) confirms the 'research hole' in early childhood settings both nationally and internationally citing that fewer than five percent of the published articles over a twelve year period in early childhood education and/or environmental education research journals discussed or reported on early childhood environmental education (p. 4). I have conducted similar searches with the same result. For this reason I conducted a pilot study for my Master of Social Science program working with educators at an inner Sydney (Australia) early childhood setting. This report (Tarr 2008) is included in Chapter 3 of this thesis.

The educators participating in this research project researched their local natural environment, including the children's perceptions of it, and designed and implemented daily experiences for the children that highlighted aspects of the natural world as defined above. The main vehicles were story telling, music, drama and the visual arts such as painting, drawing and sculpture. An outline of how these media were used with the educators, and in turn how they were encouraged to use them in developing experiences for the children, is outlined in Chapter 4 of this thesis. This research focused on the ways in which this process supports the educators in including environmental education in their programs, and the effect it has on the children in developing their knowledge of the natural world or their ecological aptitude or literacy (Capra 2002; Orr 2005).

My story as a creative, environmentally oriented educator

Prologue

I began teaching in 1985 in the Tweed Valley in northern New South Wales, Australia, in a small Rudolf Steiner School that, at the time, comprised a Kindergarten and Class 1. Steiner education is often associated with holistic and artistically based education that draws heavily on European folk cultural traditions and icons, but the school (and later Steiner schools) that I was to teach in were firmly rooted in time and place whilst adhering to the anthroposophical (Steiner 1965) tenets of the education model. We were encouraged to be creative and use the arts in the development and implementation of our programs often, and to draw upon the local environment (both human and natural world) for inspiration. This local environmental lens was used as a key vehicle through which the requirements of all Key Learning Areas in the New South Wales curriculum were fulfilled. They include: English; mathematics; science and technology; human society and its environment; personal development, health and physical education; creative arts and languages (Department of Education and Training NSW 2010).

The Tweed Valley, and the surrounding area where the school was located, was rich with rainforest and majestic mountain ranges and a strong alternative lifestyle community (Ver Berkmoes & O'Brien 2004, pp. 177-196). Initially, my teaching role involved creating music relevant to the academic content and conducting musical sessions with the children. Prior to beginning fulltime with my first kindergarten class, I spent some time with a mentor, who was an expert in Steiner education. The most seminal advice she gave me was to research the flora and fauna of my local area and be courageous and creative in representing it through the program. This involved developing stories, songs, verses, movement/drama and visual arts experiences to form

the basis of my daily interactions with the children. This of course meant developing these artefacts myself and not drawing on commercially available resources – such as they were at the time. The simple rationale for this was that no commercially available resources would specifically reflect the local area. Also, developing my own material for the program would assist the children to understand and develop a sense of belonging in the area in which they lived and provide me with endless material from which I could draw inspiration. This included analogies of animal's social behaviours, symbiotic relationships within the ecosystems and the lifecycles and habitats of the flora and fauna in the area. This ongoing research also served to deepen my own sense of connectedness to the environment in which I lived with my husband and three children.

The process for creating educator-developed content

Exploring the natural world through the arts became a different way of knowing. Learning to appreciate the majesty of an eagle's flight or the languid movement of a just-fed python took on a different dimension when explored through movement and music. The contrast between these two types of movement and that of a butterfly or bandicoot becomes obvious to the serious observer and demands different expression in music or drama. Watching the symbiotic relationships between the cows in the paddock and the egrets waiting to catch insects stirred up by their movement, provided an appreciation of two creatures working together even when the connections seem unlikely. The simple act of watching the breeze create rippling waves in the tall grass in the paddock outside the schoolroom was inspiration for a song.

This type of work combined science and art – a wonderful synthesis in environmental education (Adcock & Ballantyne 2007; Ballantyne & Packer 2009; Tooth & Renshaw 2009). Understanding the plant, animal or insect in focus also required gathering factual information so there was sufficient relevant material with which to express them through the arts. This involved regular research through libraries, documentaries and first hand experience where possible – google and the internet were a long time coming. Once the lifecycle, reproduction mode, physical attributes, behavioural qualities, habitats and associated species with whom the target animal, insect or plant interacted was known, there was a mountain of material with which to work. Then came the engaging and delightful process of creative interpretation that also included the less scientifically explicit elements such as movement, colour, demeanour and associations.

From this point, creative stories could be developed that contained a wealth of information about the topic in focus and from there, verses, songs, drama or movement and visual arts experiences unfolded. Sometimes, the song or verse came first as an

inspiration from the local natural world that would not be ignored. Mostly the stories came first so that the content could be introduced in the classroom and from there the other creative expressions followed.

A collaboration of meaning and identity

The impression may be gained from what is written above that the model of developing an educational program is that of a frustrated artist. However, it was not a top down process where I developed experiences based on what I thought was relevant or inspiring and presented them to the children. The children and I spent five days per week together in the classroom and exploring our local environment. They also lived in rural environments with varying degrees of wildness. While these children had an acceptance of nature 'being there' that their city counterparts may not have had, they did not have a substantial knowledge of what was present in the natural world surrounding them. However, often there was something that would catch their attention, whether it was a case moth case they had found, a wallaby they had seen on the way to school or a crab spotted on a trip to the beach on the weekend. They would come and tell or ask me about these incidents or share them with the group at circle time. The discussions that ensued would become the basis for our areas of focus in story and in other creative media.

Some topics took on a life of their own, others faded quickly. Those that were of interest became embedded in stories I created that included a range of characters relevant to the habitat. From there many other experiences were developed. Where the children identified with or had a strong interest in the animal, plant or environment being explored, they often asked for more stories about their favourite characters. They also often included scenarios that they wanted to see in the stories. They asked for songs, circle games and verses and helped to develop them. In our musical endeavours there was an ever-evolving Kindi top 10! One of the clearest indications that the children embraced this content as part of their developing metacognitive understandings, in addition to the engagement indicated above, was their inclusion of the characters, habitats and stories within their play (Axline 1969; Isenberg & Jalongo 1993; Hamilton & McFarlane 2005; Rogers & Evans 2006).

The children drove the topics for ongoing development. Where there was interest or curiosity then the stories would continue, sometimes for weeks, and a range of additional experiences would be developed from them. The following extract is taken from an article I wrote about the Living Curriculum for a local early childhood magazine (Tarr 2008) some time later and gives a good example of this process:

Jason arrives at kindergarten one Monday morning and at news time, tells the group about his trip to the beach the previous day. The teacher asks him what he saw there. He replies that he saw seagulls, jellyfish, and in the distance there was a whale, but they couldn't see it very well. This leads to general discussion about the whales (humpbacks), and to a number of children recounting things that they had seen at the beach, driftwood, seaweed, crabs etc…The following morning, after some home research, the teacher arrived with a story prepared about a mother whale, who was swimming with all her friends from the cold waters of the land of ice and snow, to the warm waters where there were colour coral fish. She tells the story gradually over the next several days (this stretched into weeks) and includes the differing seascapes through which the mother whale passes. Eventually, the story encompasses the birth of the baby whale, the experiences of the baby as it learns about its environment, the different sea creatures that it meets and finally, the long journey home to the land of ice and snow. The narrative is full of descriptions of creatures from the sea that the children have shown an interest in. Over the weeks of the telling of the story, the teacher develops verses and songs about the aspects of the story that the children identify with and ask for. She speaks and sings them with the children who ask for them often. From these stories also come visual and three dimensional art experiences such as painting, drawing, sculpture, and a number of craft experiences. The children incorporate many aspects of this content into their play and tell each other stories about the creatures that live in the sea, their habitats, and the social dynamics of the characters in the story. Because the teacher has researched her topic and all of the characters (sea animals and plants) included in the story, the information that the children have about them is all based on fact, although creatively rendered. The examples of social dynamics and personality traits that they have gleaned have worked their way into the children's framework for understanding their own social relationships and they can be heard making comments such as 'I am cranky today like crotchety crab' or I just feel like floating around like jingle jolly jellyfish. They even have a model for symbiotic relationships in the Super Sucker fish helping Big Blue (whale) to get rid of the itchy barnacles. The journey through the sea has taken on a life of its own. The children continue to build on it with the help of their teacher and explore it through all of the artistic media available to them.

After three months, with the support of the children's families, an excursion to the sea is conducted. The children are loaded into boats (all appropriate safety precautions are taken) and taken out onto the bay to see the migrating humpback whales. Every time they see a dolphin, a manta ray, a turtle or a jellyfish, they break into song or verse and tell the adults on board stories about what these animals do. Finally they see the whales: a mother and her calf playing in the shallow waters of the bay. It seems as if they are breaching and tail slapping just to show us what they can do. The

day finally comes to an end with children and adults alike declaring it a meaningful and moving experience.

These children are now about 23 years old. They remember, (those I am still in contact with) this part of the kindergarten year well. They also remember the stories, songs, verses and art experiences that taught them about the local animals, insects and plants on a daily basis. They remember the facts about these things but they also remember the qualities of them, how they move and what makes them interesting, clever, wise or beautiful to look at. They remember the interactions between species and the social dynamics that prevail. They know that these animals, insects or plants are worth preserving for their own sake – that the world would be diminished without them. ...

Testing past assumptions

The educational working paradigm that I have described above was not only my primary mode of teaching for fifteen years, it became the subject of many guest teaching engagements in the vocational education sector and was incorporated into many adult education programs I have been responsible for over the years. While there are many early childhood commentators who advocate for socio-culturally relevant child-led or centred programs (Isenberg & Jalongo 1993; Van Hoorn, Nourot, Scales & Alward 1993; Elliott 1995; Fleer 1995; New Zealand Ministry of Education 1996; Catron & Allen 1999; Cromwell 2000; Broinowski 2002; Fleer et al. 2006), and now many advocates for environmental education in early childhood (Palmer 1994; Davis & Elliott 2003; Elliot 2003; Warden 2005; Cutter-Mackenzie & Edwards 2006; Tarr 2006; Gambino, Davis & Rowntree 2009), the approach to environmental education in Australia has, to a large extent, focused on the sustainable use of resources and/or been atomised in nature (Elliot 2003).

As part of working consistently to maintain an awareness of what has been occurring in Australia and internationally with regard to environmental education in early childhood, I became a member of both the New South Wales Early Childhood Environmental Education Network (ECEEN) and the Nature Action Collaborative for Children (NACC). The later organisation is international and based in Washington. Interaction with these networking organisations, in conjunction with conference attendance and regular appraisal of relevant publications, has led me to understand that there is a new emerging voice in environmental education for young children: one that focuses on their connection with the natural world and the attendant physical, emotional and psychological benefits of this. This is discussed in detail in Chapter 2 of this thesis. The primary mode of facilitating this type of environmental education for children is exposure to it, that is, spending time outdoors (Gill 2005; Gill 2006;

Gill 2007). One of the most inspiring examples of this I have seen is that of the Nature Kindergartens in Braco and Crieff in Perthshire Scotland, under the auspices of Claire Warden (Mindstretchers 2010):

Children from the age of 2 years spend the majority of the day outdoors in all weathers, either in the very naturalistic garden or in the woodlands where they build dens and bird hides using tools such as saws and loppers, make fires to cook their own snacks, climb trees and generally explore the wonders that the woodlands have to offer.

While I applaud these approaches and understand that the primary experience of being in nature cannot be replicated in the classroom, I do contend that the 'Living Curriculum' (Tarr 2009) model I have outlined above is a complement to these outdoor experiences, whether they be many or few, and has numerous benefits. My intention in this research program has been to determine, beyond my own practice, if the approach outlined above, albeit modified to the circumstances of those using it, has merit in assisting early childhood educators to scaffold young children's understanding of and connection with the natural world, and to find out what benefits there may be for the children and for educators as a result of this way of working.

Chapter 2
Literature Review

Introduction

This research project aimed to assess the outcomes of including information about the natural world as core curriculum content in early childhood settings. The main vehicle for doing so is the arts. This presupposes that having information or additional understanding about the natural world is desirable and that the arts are a suitable vehicle for conveying it. The contention here is that it is in fact essential for children to have a greatly enhanced understanding of the natural world and that it has positive benefits for children and the environment. It is also my contention that the arts are a mode of expression that is most suited to complementing children's first hand experiences in nature (which may be few), and to convey information and understanding about nature to children. The following discussion explores information in the public domain about why the environment is important to us. It examines theories about humankind's connections to the environment and conjectures, at times, about how they have developed. It includes information about how relevant these theories are to the research in question and how they may assist in understanding the outcomes of the study. There is also brief comment about the role these theories play in the current climate of fear about the natural environment and how they help to justify the approach the research has taken. Most notably, the information in this chapter demonstrates the spectrum of views that position, or denounce, the natural environment as an underpinning platform from which humankind and society have developed perceptions of experience, knowledge and a sense of identity.

The philosophy of knowing nature

An investigation of the natural world and its relationship to man throughout history is impossible without a brief foray into philosophy. As early as Aristotle, philosophers were grappling with the notion of experience and knowledge. Aristotle held that perception of the physical world stemmed from primary experience through the senses. These sense perceptions were based on what a man could experience and understand from the environment that was comprised of matter and form (Shields 2009). There were also the less intangible or unknowable aspects of perception that related to the soul that formed first forms or potentialities: that which is not made of corporeal substance but part of the object being perceived. Aristotle developed what he called 'first philosophy' (Shields 2009), which included the theoretical sciences or metaphysics, including mathematics, physics and natural philosophy. His concept of perception is part of metaphysics and grappled with form (the stuff of the soul) and matter (corporeal substance) and the interplay between them. It provided a philosophical foothold that allows for a theoretical transition from the fixed physical to the theological or universal (Shields 2009). Processes of logic or use of the dialectic

applied when differing perceptions were gained by others in order to come to common understandings or reasonable approximations of truth (Riegel 1973).

Philosophers have, over the centuries, grappled with the ontological bases or realms of experience that relate to the physical world (and other realms of existence) and the ways in which we come to understand them: a concept which has been a fundamental concern of those in the field of epistemology. The monotheistic philosophers, who held that matter and mind/thought were made up of one substance included George Berkeley, Thomas Hobbes and Baruch Spinoza. The three represent a continuum of positions that range from describing life/existing substance as purely materialistic matter or substance (Hobbes – realism), to that of purely mental substance (Berkeley – idealism) (Ministry of Education 1992).

These two extremes could be seen as the forerunner of the dualism of René Descarte and the pluralism of Gottfried Wilhelm Leibniz. The former is characterised by the designation of knowledge as before or *priori* knowledge: knowledge that is gained from reason alone, and *posteriori* knowledge: knowledge that is gained from experience. The latter, or pluralism, is knowledge that is made up of an infinite number of distinct substances. Roszak, Ashton and Laura, and Louv (1992; 2003; 2006) trace the philosophical path of dualism and pluralism into psychology and suggest that it is part of the reason that psychology in general tends to discount the external world when diagnosing and treating psychological conditions. Processes of the mind, that include reasoning, are a focus in psychological conditions. However experience - formally associated with the senses and physical reality, has shifted, so that it is now firmly rooted in the social realms of family, society and state. The physical or natural world is relegated to the realms of natural science where matters of physical fact are investigated.

Of the many forms of philosophy and epistemology that have developed throughout man's history, a most prevalent scientific paradigm by which knowledge is confirmed in western society is that of empiricism. 'Objective' facts describing conditions, interactions or objects that are reproducible in controlled conditions are called truth. Our understanding of the natural world, according to Ashton and Laura (2003) is governed by such epistemological constructs. This, they argue, is a result of science investigating the 'how' of nature rather than the 'why'. The extent to which this is true, is demonstrated by the modern industrial world view that presupposes that nature has no intrinsic value and threatens or limits man's power and happiness. As a result we have a desire to know about it in order to overpower it, and this power and knowledge can be gained by answering questions about how nature works (Roszak 1992 p. 51). The natural world, therefore, is something to be controlled rather than experienced.

Dominion over the earth

Empirical science has been the generator of modern industrial practices and economic measures in the first world that depend on treating the earth as a resource for mankind's use (Shiva 2005). This utilitarian use of the natural environment is almost second nature to

developed industrialised countries. One only has to watch the news in the evenings to see the emphasis placed on the stock market and the industries of which it is comprised. The so- called resources boom in Australia in the last couple of years seems to further emphasise that the earth's resources are there to support our way of life. It could, however, be argued that this has been the attitude of capitalist societies since the industrial revolution (Jackson 2009).

Even Marx who considered that the capitalist model of industrialisation was seriously flawed, had a largely utilitarian approach to natural resources. Alfred Schmidt (1971) discusses Marx and the way in which he viewed nature. He claims that Marx is misrepresented when it is said that nature played no part in his writings or constructions of society. Rather, he claims, the natural world was an inherent underlay in the Marxist conceptualisation of materialism wherein an historical, industrial perspective must be used when seeking to understand the development of man and his relationship to society. For Marx, it appears that the natural world becomes meaningful when we can utilise it for the common good. Schmidt (1971, p. 30) paraphrases Marx in the following way: 'As long as nature remains un-worked it is economically valueless, or rather, to be more precise, has a purely potential value which awaits its realisation'.

Other sciences such as modern psychology have also in the past relegated the natural environment to the realms of an invisible backdrop within which, or perhaps in spite of which, individuals live out the various desires, patterns and occurrences of their lives. Freud, one of the most influential psychiatrists of our time, conducted his explorations of the psyche through internal constructions. The maladies suffered by his patients related to their experiences of instinctive sexual frustrations, unresolved child/parent conflicts or reflections of the individual against the social realms of society. Theodore Roszack (2001) describes Freud's reality principle in the following way: 'What father and mother, church and state, friends and neighbours, defined as sanity was sanity' (p. 53). The natural environment represented processes of decay and death and was to be psychologically categorised and put aside for the more immediate pursuit of finding equilibrium of mind.

Even more recent psychologists such as Jerome Brunner (1966), Uri Bronfenbrenner (1979) and Lev Vygotsky (1978) who propound the importance of familial and social constructs for the healthy development of the child, do not include the natural world in their tapestries of existence. Bronfenbrenner's Ecological Theory (1979) where the outer realms of our society includes the state, the church, the systems of government and the values upon which they are based, comes closest to encompassing all of the influences in a child's life. The one that he leaves out is the planet on which the child lives, that which supports our very existence as humans.

Since the 1970s and '80s when the 'environmental movement' became prominent in Australia, there have been many new conceptualisations (as distinct from those of Indigenous peoples) of the human relationship with the natural world and its

importance. Many of them have been based on fear of the consequences of environmental mismanagement (Macy 1983). However, there are those who champion the importance of an inherent understanding of man's relationship to the environment. What follows in an exploration of some of them.

Biophilia

Biophilia, according to Edward Wilson (1984), is the innate connectedness with all things biological. He describes it as a yearning to explore, be part of and interact with all things of the natural world with all of the senses. He speaks with an almost religious sense of wonder about the colours of the forests, the movement of the breeze and '...the naturalist's trance, the hunter's trance by which biologists locate more elusive organisms' (p. 6). He highlights the fact that 'man' emerged into the already developed natural world and that as a result we are eternally fascinated by it and constantly seek to discover more about new places and new life forms within it.

For Wilson, great pleasure is to be found in unadulterated landscapes where no trace of human habitation is to be seen. Poetry is the medium for describing complex scenery, the beauty of which man cannot comprehend. He highlights the somewhat paradoxical relationship between man and the natural environment as our ever-growing sense of wonder for it drives us to explore and understand more about nature. On the other hand he cites the inherent motivation for discovering more about it as the need for control or mastery: 'Nature is to be mastered, but (we hope) never completely. A quiet passion burns, not for total control but for the sensation of constant advance' (p. 10).

This approach has a hint of biological determinism that speaks of a compulsion to interact with nature as an inherent human condition. It is a theme touched on by many researchers as it relates to man's behaviour when in nature (Hewes 1974; Handicapped Adventure Playground Association (HAPA) 1978; Wilson 1984; Jambor 1986; Seed, Macy, Fleming & Naess 1988; Walsh 1991; Isenberg & Jalongo 1993; Cunningham 1994; Phenice & Griffore 2003; Ingunn 2004). However, the basic premise for the development of this innate biophilic connection with nature, and the expression of it, is based on having first hand experiences in the natural world. There is considerable research to show that people who spend time in the natural environment develop environmental values and behaviours (Chawla 2007; Ballantyne & Packer 2009). The lack of opportunity for people to experience nature and to explore their sense of connection to it, such as those who dwell in our major cities or children who spend each day in a in a high-rise childcare facility, is the focus of concern for commentators such as Robert Pyle (2002) and Richard Louv (2006), who refer to the de-naturisation of children's experience or nature deficit disorder respectively. Indeed it is difficult to see expressions of biophilia in children or adults when there has been limited exposure to the natural world. Dewey (1926) says this is unsurprising as time spent in nature is what develops an appreciation and understanding of it.

This inherent relationship with nature is approached from a more pragmatic perspective by Emilio Moran (2006) in which he cites human agency and survival as key factors. Hunter gatherer societies, he says, exercised choice over where they roamed and hunted, depending on their success on any given occasion or series of occasions. The earth provided and they responded according to its ability to do so. This ability to exercise choice, and the propensity to bump into other tribes hunting and gathering as populations increased, led to the development of agricultural societies, prompting man to exercise a degree of control and agency over nature. There is an implication in what he writes that the success of these methods of survival has imbued man with an inherent belief that with the judicious use of human agency, whether through choice or necessity, that the earth will provide.

This conceptualisation, Moran adds, becomes less applicable, or subject to misconceptions, when the sources of the goods or services that we consume are outside our local environment, where we can not see the impact of their provision. While this idea gives some insight into why, as a species, we tend to think locally, its value lies in the fact that it highlights mankind's inability to respond to the needs of his broader environment unless he can see it or is directly affected by it. This raises questions about our current ability, as a society, to operate in concert with the environment in spite of the fact that there is a wealth of information to support the need to do so. It suggests that a key premise for our relationship with the natural environment, in the modern world, is one of exploitation for our own benefit, particularly when this exploitation is not in our own back yard. This, taken to extremes, is what Roszack (2001) refers to as material wants that have become needs, which have become realisable through the relatively recent and wide-scale capacity for discretionary spending in the developed world. This discretionary spending promotes the use of resources that are not renewable to create items that are not needed but are justified by the right to exercise individual taste and the need to support the ever expanding economy. The ongoing need for this expression of taste and individuality comes of trying to fill a void that he claims is ultimately caused by a disconnection with nature.

In a similar vein to Moran, Paul Shepard (1982) claims that the very development of agricultures, rather than the industrial revolution, is the root of mankind's development of false sense of separation from the earth and the natural habitat. Effectively, he says it represents an abrogation of our responsibility to act according to the interdependence between all life forms. However, he does offer some hope for the future by concluding that we as a species have a latent ecological harmonious sense of self, intrinsic in our nature. The many proponents of deep ecology (Seed et al. 1988; Naess 1989) and ecopsychology (Roszak 2001) through the 1980s and '90s have echoed this idea.

Ecopsychology

The condition of being connected to the earth and the environment and feeling oneself as a part of nature is the basis for what has been called deep ecology (Naess 1989) or

ecopsychology (Roszak, Gomes & Kanner 1995; Roszak 2001). Whilst deep ecology has an underpinning tenet that all living organisms have an inalienable and equal right to existence, ecopsychology emphasises the inherent connectedness that we feel with the natural environment and the way in which it can affect our behaviour. Both are a departure from the anthropocentric view of traditional psychology in that they credit the natural environment as a key influence on feelings and behaviour.

Ecopsychology has emerged as a new branch of psychology, yet it goes much further than conventional psychology in that it attributes to man an ecological unconscious. This is an inner knowing that we are part of the planet, the solar system and the universe. It involves an understanding that we all share in the life of our planet, its history, its composition and place in the cosmos. This awareness is current when we are born and includes the period of our lives. However, for most of us, this awareness becomes clouded by what could be called urban alienation. This condition is one that causes us to lose our sense of environmental reciprocity, which is of course, impossible to have if we do not recognise the extent to which we are dependent on, or part of, the natural environment. The aim of ecopsychology is to 'heal the more fundamental alienation between the recently created urban psyche and the age-old natural environment' (Roszak 1998, p. 4). This alienation is, according to Roszak, the cause of the 'collusive madness' of industrial society (p. 3). Roszak does not condemn the modern western lifestyle but rather highlights the wisdom of finding ways to live sustainably that include current third world countries that aspire to western living standards. He promotes ecopsychology as *post*-industrialist rather than anti-industrialist wherein the 'technological genius' of our time should be utilised to its full extent (p. 5).

Roszak (1998) contends that childhood is a crucial time for regenerating the ecological unconscious. Children have a innate sense of wonder for the natural world that can be nurtured through the arts and through direct experiences in the natural world. This assists in developing the 'ecological ego' (p. 4) that matures as the child grows with a sense of environmental ethics that encompass social and political dimensions.

Ecopsychology also seeks to re-assess the masculine qualities that are an inherent part of our interactions with the environment. The need to dominate, mechanise and utilise are characteristics that have led to alienation from the natural world and a mode of interaction that a sees us as society utilising it for our own gains, regardless of the destruction that this has wrought or the disenfranchisement of peoples in developing countries. This mode of interacting with the natural world is perpetuated by industry and politics as both are predominately masculine (Roszak 1998; Shiva 2005). Ecopsychology then, draws on the tenets of ecofeminism to encompass more compassionate, collaborative ways of viewing our connection with and dependence on the natural environment.

Ecofeminism

Ecofeminism draws compelling parallels between the subjugation of women and the subjugation of the earth. Ecofeminists highlight the similarities of processes involved in the domination of women and of the land in patriarchal cultures. This idea is an extension of the work done on gender relationships by feminists and feminist psychologists in the second half of the twentieth century and builds on feminist psychology by including the natural environment as a stakeholder in the realm of relationships (Gomes & Kanner 1995). The current pervasive cultural paradigm of masculine individuality and autonomy, expressed as a need to conquer or dominate, is enculturated in young boys from birth (Gomes & Kanner 1995). Men become the dominant owners of land, over-use and exploit it, leading to the need to dominate others in order to maintain levels of productivity. In the extreme, this leads to forced trade deals that keep poor people poor, allows the minority to continue to live beyond their (the earth's) means and triggers war where there is resistance (Shiva 2005).

As stated by Heather Eaton (2006), women were actively responding to ecological issues long before the term ecofeminism was coined by Françoise d'Eaubonne in 1974. Examples of this include their activism during the Vietnam War when Agent Orange was used, and protests about herbicides in soils and waterways (Carson 1962; Eaton 2006). Our dependence on the earth is total. Ecofeminist insight is useful in helping to identify the relationships we have with the planet and the ways in which we have entrenched exploitative attitudes. It provides models of equality between the genders, and promotes the inclusion of the environment as an identity or stakeholder assists in finding workable solutions to coexistence. It also seeks to find direct relationships with the environment; how we should interact with it, utilise it and teach our children to recognise its importance in our lives. This new relational interactiveness seeks to empower individuals and foster creativity and growth that is not dependant on overpowering another. This is particularly important according to Gomes and Kanner (1995) as 'hyperindividuality' is a relationship model that is not sustainable.

Sustainability

When environmental awareness began to make inroads into schools in the 1980s in Australia, the message was clearly designed to ensure children understood the seriousness of environmental degradation, and developed understandings to assist them to take action to remediate it and prevent further exploitation of the natural world (Evans & Boyden 1970). By 1995 in North America, environmental education aims had been refined to the extent that research was aimed at measuring student's environmental literacy (Hoody 1995; Capra 2002).This included cognitive understandings, affective or emotional attitudes and willingness or capacity to act.

It may be considered that little has changed when one reflects on the Australian Government's current position on education about the environment articulated in *Educating for a Sustainable Future: A National Environmental Education Statement for Australian*

Schools (Australian Government 2005). This document makes it clear that the reason for environmental education is to enable young people to take stewardship of the land, to preserve its utility and to remediate environmental damage. There are also statements that reflect the aesthetic value of the land and the cultural significance of tracts of land (particularly those that are identified as significant by Indigenous peoples). However the emphasis is clear when, in describing the nature of the document and the purpose of environmental education, it states the following:

> *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.* (United Nations Decade of Education for Sustainable Development 2005-2014).

On reading this, the message that we are 'doomed if we don't' is quite clear. While there are many aspects to environmental education that are necessary if children are to develop an appreciation of how they are to live, the sheer weight of the responsibility that the current educational focus places on them to repair the damage that has already been done and to develop new ways of living in the future, may hinder them in doing so.

Although there is in Australia a draft curriculum document for kindergarten to year 10 of secondary school (ACARA 2010), the cross-curricula nature of the sustainability thread in these documents may mean that without substantial support, educators are unable to focus on this topic in any meaningful way. In the new *Early Years Learning Framework* for the prior to school sector (DEEWR 2009) there is specific focus on connection with the environment and sustainability. However, there is a risk, given the atomised, pragmatic and often didactic nature of current early childhood sustainability practices, and considering the framework's promotion of intentional teaching as an educational paradigm, that the sustainability focus will be on what is wrong with the environment rather than on connection with it. This is not a criticism of intentional teaching, but a concern about how it may be interpreted. Hopefully the intentions espoused in these new documents will be reinforced through quality professional development opportunities that will assist educators to interpret the focus on sustainability in a manner that supports connection with and understanding of the environment .

It should be stated that many of the environmental education programs implemented in Australia and internationally have gradually shifted focus from environmentalism to sustainability over the last twenty years. Environmentalism is characterised in *A National Review of Environmental Education and its Contribution to Sustainability in Australia: Frameworks for Sustainability* (Tilbury & Cooke 2005) as being or fighting against something (P.11). Sustainability is broader and incorporates an awareness of all elements that make up quality of life and the way in which the natural environment supports them. It also includes the notion of capacity building for taking action for the environment.

Taking action for the environment is essential and involves many everyday actions such as use and recycling of resources or responding locally (or more regionally) to inappropriate use or treatment of land (Davis & Pratt 2005). However, I contend that in attempts to teach toward the goal of capacity building, there is an inescapable motivation on the part of many educators that is rooted in concerns about our impact on nature and the extent to which this contributes to the larger environmental crisis we face. Too often, in the early childhood education and care environment, it is these concerns that become the focus or the reason for the everyday actions we take for the environment. If we want to build capacity we need to start at a foundational level that assists children to connect with the natural world rather than risk frightening them with the scale of the problem or weight of responsibility for remediating environmental damage.

The weight of responsibility felt by children and young people about the environment has, according to some commentators, led to a feeling of helplessness and a despair that makes constructive thought or action impossible (Macy 1995; Macy & Brown 1998). Joanna Macy describes an emotional miasma that has developed as a result of knowing, for the first time in history, that the certainty that there will be generations to follow us is gone. She articulates the emotions as: terror at the thought of the suffering our loved ones will endure; rage at the avoidable and meaningless end to human enterprise; guilt that we have contributed to this state of being; our lack of ability to avoid the disaster, and above all; sadness at such a final all encompassing loss. She goes further by saying that as a part of the greater whole, the earth organism and/or the universal mind [my interpretation of the whole], we feel this despair at our core, regardless of the extent to which we are directly exposed to it. If this is so, how much greater must this feeling be for children who are regularly fed information about environmental degradation and told they have the responsibility of fixing it? The question remains: how do we approach the topic, knowing that action is required and that education is an important part of this process?

Outdoor learning and education

There are more intermediate links between philosophy, the arts and education. John Dewey (1926) 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 phenomena include sound, texture, colour, movement smell and proportion. They are all apprehended through sensory impressions. In this conception of connectedness with the natural world, there is room for emotion in response to phenomena, for reason - post experience, and for intuitive understandings or perceptions. Indeed Dewey says that these perceptions, when expressed through creative media become art and that this art in turn becomes the medium of communication between man and the natural world: the highest form of which is poetry (Leddy 2008).

Steiner's 'Anthroposophy' or 'Spiritual Science' (1985[1922, 1923 lectures]) places humankind at the pinnacle of corporeal development on the earth but in direct relationship with it as far as perception is concerned. Much can be learned about man, his emotions and the wisdom of being by observing animals and nature. Man and nature are built of the same corporeal matter albeit imbued with different qualities. Spiritual realms can be glimpsed through natural phenomena and imaginative comprehension or perception can be as valid as so called objective fact. This is particularly so with regard to the artistic interpretation of the natural world. To creatively interpret movement of the elements or animals, the realms of consciousness they inhabit, and the wisdom of nature that they represent through speech, movement and music, is among the highest of creative endeavours.

These two movements still have resonance when we investigate iterations of ecopsychology from more recent times. Macy and Brown (1998), Roszack (1992), Naess (1989), Shepard (1982), Suzuki (1997) and Seed et al. (1988) all tell a fundamental tale whose moral is that we must deeply connect with our environment, and with the planet. In doing so, in empowering each other to recognise what is happening to it and in investigating new ways of being within it, we will rediscover a means of living sustainably and in harmony with it. There is little doubt that we need to find new ways of living and being in the natural world and that our current capitalist model of exponential growth and economic prosperity will not afford the fundamental mind-shift that is required (Jackson 2009). It is conceivable that adults can overcome their despair of the environmental crisis and work constructively toward finding solutions. It is difficult to see, in the current industrial, political and educational climates – not to mention the earth's climate crisis, how society can support children in developing new sensibilities about the environment that will not leave them in a state of environmental paralysis. Added to this is the limited exposure to nature that will further inhibit an understanding of what it is to connect with nature (Louv 2006).

Naturally acquired understandings

Children develop understandings about life and about their world in a variety of ways. Sensory perception is considered to be a primary force in early childhood (Piaget 1953; Dewey 1958 [1926]; Steiner 1965[1906-1911]; Dewey 2002 [1921]). Children's cognition is also developed through language, through social interactions, through routine and through socio-cultural paradigms (Steiner 1965; Brunner 1966; Rotman 1977; Piaget 1983; Halliday 1985; Dockett 1995; Elliott 1995; Dahlberg, Moss & Pence 2000; Fleer, Edwards, Hammer, Kennedy, Ridgway, Robbins & Suman 2006). Another key mode of learning about the social, and for developing contextual understandings about life, is play (Axline 1969; Isenberg & Jalongo 1993; MacNaughton 1994; Berk & Winsler 1995; Dockett 1995; Elliott 1995; Dockett & Fleer 1999; Hamilton & McFarlane 2005). During play children express aspects of their experience, extend on and contextualise their understandings, develop and test theories and integrate feelings and emotions. All of these activities and learning influences contribute to them gradually becoming members of their society. In this respect, little has changed

in thousands of years. What has changed is the nature of society and the extent to which children's lives have become denaturised (Cohen 2000; Ingunn 2004; Louv 2006). Richard Louv (2006) wistfully narrates tales from his childhood that involve playing in the woods, building cubbies, floating boats on streams, fishing and climbing. He enthusiastically recounts the many opportunities there were for conceptual learning and for exploring a range of feelings and emotions. For many of his generation, this was a natural education. For many children today, particularly those with limited access to the natural world, opportunities to learn in this context are few indeed.

There is a groundswell of voices now that champion the right for children to be able to play outdoors and in unstructured environments (Roszak 2001; Pyle 2002; Phenice & Griffore 2003; Gill 2004; Gill 2005; Gill 2005; Warden 2005; Louv 2006; Gill 2007; Gill 2007; Gill 2007; Ballantyne & Packer 2009; Tooth & Renshaw 2009). What has been clearly demonstrated through studies conducted by many of these advocates is that children are stronger, fitter, happier, more cognitively dextrous and more capable of environmental stewardship when they can spend time outdoors. They also show that children, through this kind of activity and play, become risk assessors in their own right. Many people of the baby boomer generations can recount stories of building cubbies and tree-houses or rafts for crossing small water courses, fossicking in creeks or climbing trees in forest settings without adult assistance or supervision. The skills and dispositions learned through these experiences include risk assessment, physics, natural sciences, cooperation and a joy in discovery and in movement.

According to Capra (2002) there is an additional, all important skill that is one of the filters through which we mediate experiences of the natural world: that is artistic or aesthetic appreciation. We have a natural capacity to recognise the patterns in colour and form and add the impressions they give us to our map of relationships. Our interactions with the natural world stimulate this aesthetic appreciation and this in turn supports our ability to recognise the characteristics of pattern, form, colour, sound and movement (page 5). He claims that the study of patterns, particularly as they relate to living systems or the environment, is central to understanding ecology and should be a key factor in education for all children. This is part of what Capra (1999) calls ecoliteracy. Roszak (2001) also claims that the arts 'have a vital role in curing our environmental ills' (p. 260). He says this in the context of a discussion about appreciation for fine craftsmanship, wherein he claims, a revival of this understanding of quality may be useful for ameliorating societies need for rampant consumerism. However, evident in both Capra's and Roszak's views is the need for children to experience the natural world.

Nature kindergartens

There is an emerging development in provision of education and early childhood settings that provide experiences in nature that range from periodic sessions in the forest for an

educational semester, to being and doing outside as a core part of the program (Wallis 2004; Archimedes Training LTD 2007; Mindstretchers 2010). In Scotland, in the Perthshire region, there are two nature kindergartens run by Mindstretchers and championed by Claire Warden. They are both set in small villages, Auchlone and Whistlebrae, with wild woodlands within easy walk for the educators and children. The three to five year old children who attend these kindergartens spend up to ninety percent of their time outdoors in all weather. In winter the children are provided with thermal underclothing and suitable waterproof outfits to ensure comfort and flexibility of movement.

The children create whole play environments using the 'loose parts'(Nicholson 1974) available to them. They build cubbies and fairy houses, climb on logs, create makeshift swings, weave through or hide under the undergrowth and observe the many animals and insects in their play space. The learning that results from the children's creative interpretation of natural items, through problem solving their identity, or from working out how they are going to achieve a particular objective (such as climbing a tree), is open-ended and will continue to grow with the children and their developing metacognitive schema. What they experience while outdoors is followed up with discussion and creative arts experiences both outside and inside the classroom.

Across Europe there are also nature kindergartens and their approaches vary from short regular periods spent in a natural environment to those that spend almost all of their time outdoors. The Waldkindergärtens in Germany number up to 700 and run programs that can involve the children being in the forest for five hours per day (Esterl 2008). The children engage in similar activities while outside to those mentioned for the Scottish nature kindergartens. Like their Scottish counterparts they also have a shelter that can be used if the weather becomes too inclement. Similarly the children use real tools for construction and use their physical bodies, as well at their imaginations, extensively. As a result the children are seldom ill, have very few accidents and are better at concentrating and communicating than their counterparts (Phenice & Griffore 2003; Esterl 2008).

The need for direct experience of the natural world is also highlighted by the success of the forest schools movement in England and northern Europe. Studies have shown that programs that place children in a forest environment for only a few hours per week over a single semester can result in children who are less stressed, have higher self-esteem, have better coordination, are generally more resistant to viral infections and have better social skills (Archimedes Training LTD 2007). Forest school programs are usually developed from the children's interests but also teach basic skills for physical interaction and survival, and natural sciences. They are generally for primary and high school children (there are some forest preschools) and the program also allows time for the children to engage in free play or self-directed pursuits. The forest school model came from Sweden in the 1950s and was implemented in the UK in the 1980s. There are, as of 2006, approximately 160 forest schools in the UK (Archimedes Training LTD 2007).

Forest schools vary in the programs they offer for outdoor experiences and these programs have been shown to have a positive effect. However, it is also important that the ways in which these experiences are reflected on or unpacked, when in the classroom, are positive. A didactic or atomised deconstruction of the experience that focuses on the 'how' of nature may diminish it (Hoody 1995; Orr 2004; Sobel 2005), whereas an approach that allows for affective reflection and development of a metacognitive narrative may assist in deepening the experience (Tooth 2006; Adcock & Ballantyne 2007; Tooth & Renshaw 2009). Roszack, Cohen, and Ashton and Laura (1992, 2000, & 2003) cite the development of the atomised and mechanistic paradigm as an underpinning reason behind our current environmental crisis. In contrast, they expound the value of exploring the 'why' of nature, as this is more likely to enable us to develop an understanding of the interrelationships and the symbiosis with which nature operates (Roszak 1992; Roszak et al. 1995; Cohen 2000; Ashton & Laura 2003).

This is not to suggest that the approach that forest schools take in their 'in school' activities to build upon the outdoor experiences is inappropriate. Indeed, the knowledge of what individual schools do is beyond the scope of this researcher. Suffice to say that the children at forest schools would have more possibility for creative interpretations of their outdoor experiences, which include affective and physical domains of understanding, than those who study the natural environment from an indoor perspective.

This research project seeks to build on this understanding of the 'why' of nature. Using the arts to interpret these in-situ phenomena and experiences to understand the dynamics of the interrelationships between species, and to identify the key qualities of these on-the-ground experiences, may help children to experience the 'what' of nature. It seeks to examine the effect that content, based on the natural world, can have on children and their sense of connection with nature, by working through their capacities for creativity, imagination and play.

Place-based education

Place-based education is education that connects school children at primary and secondary school levels to their environments and communities and is gaining momentum in the United States of America (Sobel 2005). It counteracts the action paralysis that comes of fear-based catastrophising about the planet by encouraging children to think about the earth where they live (Sobel 2005). It draws on the children's local environment, both natural and built, to teach concepts in a variety of subject areas including sciences, maths, arts, language and social studies. It does so by getting children outdoors into the community to investigate the various elements within it and to find the relationships and interfaces between society and the environment. This promotes a problem solving approach that involves the children asking how the situation in question developed, what needs to be done to change it and how to go about it. Sobel (2005) gives a number of examples of real world projects where the

children have initiated and driven community improvement projects, in conjunction with community officials and professionals, that have inherent within them a range of learning opportunities. They include third graders writing a book in collaboration with a children's author about the local moose, beavers and skunks, and middle school children investigating and remediating water quality in a local stream. Again this occurred in collaboration with local civic and professional people.

> *Emphasizing hands-on, real-world learning experiences, this approach to education increases academic achievement, helps students develop stronger ties to their community, enhances students' appreciation for the natural world, and creates a heightened commitment to serving as active contributing citizens.* (Sobel 2005, p. 7).

The common element to all of these experiences is that they involve substantial interaction with the community and, in addition to the many educationally measurable outcomes, help to develop a sense of belonging in place.

Sustainable preschools

In Australia there were in 2003 a small number of preschools that include a focus on environmental education (Elliot 2003). While there may be increased numbers now in 2010, in 2006 they were still limited (Cutter-Mackenzie & Edwards 2006). Their practices may include gardening, (and cooking garden produce), composting, worm farms, recycling, solar systems and rainwater tanks. Depending on the motivation, these practices can be useful in terms of teaching children about the responsible use of resources. However, where the primary motivation for engaging in these activities is to 'save the planet' the benefits to the environment may well be outweighed by the paralysing affects of the 'we're doomed if we don't' message (White 2004; White & Stoecklin 2008). Where these practices are entrenched as a constructive sustainability culture of the organisation, they can become life long habits that support active and responsible environmental citizenship (Sobel 2005). Some of the Australian preschools also include a specific program focus on sustainability, which in 2010 has moved on from what David Sobel (2005) calls catastrophe education, to include notions of belonging to and connecting with the planet and being part of the local community. Hopefully this will increase if the intent of the 'belonging' element of the Early Years Learning Framework (DEEWR 2009) is adopted.

Julie Davis and colleagues emphasise the 'think global, act local' idea and advocate for learning *for* the environment as distinct from learning *about* or *in* the environment (Gambino, Davis & Rowntree 2009). This is similar to place-based education in that it is characterised by learning that conceptualises children as active agents in the construction of their understandings and in the community. In reporting on the Sustainable Planet Project (Davis & Pratt 2005) the authors highlight the action orientation - learning *for* the environment, in the unfolding of the *Sustainable Planet Project: Creating Cultural Change*

at Campus Kindergarten. The children took on the role of community activists by writing to their local newspaper about the shopping trolleys that had been left in their garden and in a nearby lake. This resulted in front page newspaper coverage and the local supermarket erecting signs regarding the use of their trolleys in areas other than the carpark. This example shows how children can include environmental understandings at a local level as part of their metacognitive schema and how they can be active agents of change. While there are a number of early childhood settings in Australia that include environmental education as part of their programs, very few do so systematically or in a manner that would assist children to connect with their local community or natural environment.

Supporting environmental understandings through the arts

If the arts are effective in assisting children to integrate their understandings of pattern, to correlate relationships and to express their understandings and emotions (Feral 1999; Capra 2002), I suggest through this research that they also have a role to play in helping children to understand the natural world. The arts contribute to them developing a connection with their local natural environments, which is one of the key precursors to active citizenship and stewardship *for* the environment (Orr 2004; Sobel 2005). This is because the arts are an effective vehicle through which children can be provided with opportunities to understand and identify with the lifecycles, habitats, interrelationships, form, colour, patterns and wisdom of the natural world. I contend that working in this way also assists in a developing sense of belonging in place and an understanding of the importance of place (Suzuki 1997).

The arts are routinely included as key modes of expression in early childhood settings. It is widely recognised that children express their thoughts and feelings through the arts, and, for observers, their artistic creations provide insight into their metacognitive development (Malchiodi 1998; Heegaard 2004; Kolbe 2005). Early childhood services across the country provide drawing, painting, collage, music and dramatic play experiences on a daily basis. For them to turn their focus to expressing their local environments through these experiences would dramatically increase the children's exposure to concepts about the environment if nothing else.

The essential artefacts of sensory perception, including colour, form, sound, movement, smell and texture, have unlimited expression in nature and as such are well suited to the various artistic media. When working with children aged between 18 months and 3 years, in the pilot project that preceded this research, the children readily grasped the qualities of the subjects of the natural world that were explored using the arts. They drew and painted pictures of animals, birds and trees and told stories to each other about the characters they had been introduced to by their educators. This in turn led to them displaying heightened awareness of their environment, whether on their way to daycare or on weekends with their families. They then incorporated the experiences they had outside of the childcare setting, into their imaginative interactions with their peers (see Chapter 3 in this thesis for a full report on this

research project). It would have been most interesting to track the children's general health and well-being to determine if there were any specific benefits such as those experienced by children spending more time in the natural world.

Physical development and health

We know that children need to exercise their bodies in order to maintain physical fitness. With this in mind, children's playgrounds, since the turn of the 19th century have included swinging and climbing apparatus and broad areas of grass for running or other gross motor games – the general idea being to get the children off the streets and into safe areas for play (Blackford 2004). There have, however, recently been explorations into the health and fitness outcomes for children when they have a natural or ecologically diverse play space (Blackford 2004; Ingunn 2004; Archimedes Training LTD 2007). Ingunn Fjørtoft's (2004) study showed that children's motor fitness, balance and coordination significantly improved when playing in an environment that had varied ecological features and elements of wildness.

Louv (2006) champions the child's need for playing in natural environments to assist them in developing not only a connection with nature but also to refine their judgment, to practice risk taking and to learn a myriad of skills related to physics, proportion, distance and strength. He also cites playing in wild spaces when he was a child, as one of the few opportunities that he and his baby boomer compatriots had for playing outside the gaze of the adults. Tim Gill, an eminent authority on and advocate for children's outdoor play, and adviser to the British Government on play and outdoor experiences for children, cites the need for children to play outside to support their physical development, moral understanding, development of discernment, problem solving abilities and their mental health (Gill 2004; 2005; 2006; 2007). He also debunks the media hysteria around stranger danger and other threats to children from adults with unwelcome intentions, while recognising that these fears are major factors in children not having freedom of movement (Gill 2007).

Holly Blackford (2004) cites the playground panopticism (on the part of mothers, fathers or carers) that is common in children's playgrounds as a mechanism that restricts children's abilities to play in unstructured ways. She infers that this intense scrutiny deprives children of the opportunity to develop complex understandings for initiating and managing social interactions and to manage risk. She contrasts the ongoing surveillance that occurs in these settings with the absence of surveillance applied in structured commercial playspaces such as the coloured structures, tunnels and enclosed spaces in the children's areas of McDonalds. Ironically, in this study, she was able to show that the children in these settings were able to play away from the controlling influence of the adults and that the adults interacted with their peers and took a break from parenting. Given that children show a preference for independent play in varied spaces where they are not monitored too closely, it is hard not to wonder at the associations they might develop between the type of food available in these places and the exercise of independent decision making and social interaction.

Conclusion

The central contention of this research project is that arts-based teaching pedagogies are a means of supporting a child's connection to the natural world and their understanding of it. They can be implemented on a daily basis in an early childhood setting. Arts-based teaching pedagogies that focus on the natural world are particularly relevant when children have limited exposure to the environment because they provide them with an additional framework for appreciation of and connection with the natural world. This appreciation and connection becomes a complementary way of knowing and understanding the natural world for children (and adults) when they do have first hand experiences outdoors. The key question this research asks is to what extent the ongoing artistic exploration and expression of the phenomena and qualities of the natural world affect the children's and educators' understandings of the environment and their feelings of connection with the planet.

Chapter 3
Enhancing Environmental Awareness Through the Arts

Introduction

This chapter reports on the action research project: Enhancing environmental awareness through the arts. This project was the pilot for the current research and involved working with two early childhood educators and twenty eight children in a long day care centre in the Sydney Central Business District at the end of 2006. Its aim was to assess the outcomes for the educators, and for the children with whom they worked, 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 educators in the 2–3 year-olds' room were interested in how this project could help to incorporate the natural environment into their programs.

There are some significant differences between this 2006 pilot project and the current research process. The children in this pilot project were aged 18 months to 3 years and were all from the same room in one early childhood centre. The model of implementation involved evening workshops with the educators, rather than me attending the child care service to model the techniques for implementing the content about the natural world.

The literature review has also been removed from this report as the theoretical underpinnings for this project are incorporated into literature review for the larger research process and appear in Chapter 2 of this thesis. Some paragraphs have been deleted from this chapter to avoid repetition through the whole of the document and there are minor changes in terminology to ensure consistency. The remainder of what is written in this chapter forms the original report for the pilot project as published in the *Australian Journal of Early Childhood* (Tarr 2008).

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 the extent to which 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 environmental 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.

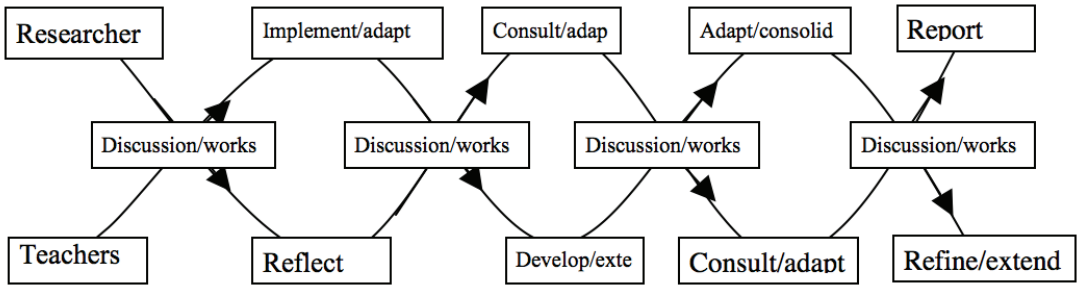
Implementation

The researcher met with two early childhood educators (who worked together in the same room) for five two-hour workshops over a two-month period. During these workshops, with the facilitation of the researcher, the educators explored techniques for using the arts to incorporate concepts and representations of the natural world into their programs. Using the arts meant creating original stories, movement experiences, music, painting, drawing and handwork experiences. There were no children present during these workshops. In between workshops, the educators incorporated their newly developed self-generated creative environmental content into their daily program with the twenty eight 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.

Teaching about the environment through the arts

The educators 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 artifacts 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 to be essential so that the material presented was meaningful and accessible (Palmer 1994; Wals 1994; Davis & Elliott 2003). The capacity of the educators 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 and reporting (in subsequent workshops with each other and the researcher) supported the development of new content for the program that could be adapted and implemented at the discretion of the participating early childhood educators (Goodfellow 2005; Yorks 2005; Groundwater-Smith 2008). The model of interaction, while not representative of the number of meetings, is depicted in Figure 3:1.

Figure 3:1 Model of collaborative action research



Recruitment

The process outlined above clearly positioned the educators 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 (Rodd 1997; Henderson-Kelly & Pamphilon 2000; 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 educators 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.

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 2001), formal written observations and audio/visual records, work samples from the children, and records of conversation with the children or their family members (Puckett & Black 2000; Arthur, Beecher, Death, Dockett & Farmer 2008). As all of these methods are valid forms of recording data (Arthur et al. 2008), the research project did not prescribe the methods the educators used; rather, it incorporated their current practices.

Another form of empirical data was generated through a brief questionnaire. The educators 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 educators.

Data was discussed and analysed at each workshop and at the final meeting. During this meeting the educators were asked to summarise the key outcomes from each workshop including 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; the main areas of focus in it, the ways in which the educators incorporated the information from the workshops into their programs with the children, and the effect his had on the children over the course of the research period.

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.

The educators 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 the educators 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 educators 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 educators 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 storytelling medium was one that the educators 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 educators 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 (Early childhood professional 1).*

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 they had experienced in their local area:

> *It was so hot and blowy on the beach it stinged my face (Child, 2 years 5 months, talking to another child).*

They talked about the story 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, 2 years 4 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 educators 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 educators highlight their enthusiasm for creating and telling stories of this nature.

Movement and music

The second session focused on movement, music and verse. It provided examples of how one can extend on a given story 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 creation of songs and verses was not an activity the educators engaged in following the two-hour workshop covering this topic. 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 after one brief workshop. The workshop participants felt that with additional time and support, they may be able to incorporate self-generated music and verse into their programs.

The educators said music and movement were the areas where they were most out of their comfort zone. At the end of the project (meeting five) they 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. They were surprised 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 as were the techniques for drawing. 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 educators 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 and leaves.

The educators 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 that she was doing as part of the story 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 educators intended to explore further.

The children appeared to embrace the drawing experience presented to them by their educators. They created their own pictures while telling the educators, and the other children, stories about the story characters or natural growth processes they were representing. The educators predicted, correctly, that the children would continue to draw their stories using the growth processes outlined above. 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 woollen 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 educators 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 educators 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.

Responses to the questionnaire

The educators' 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 creative 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. It also demonstrated that there were benefits for the educators involved as well as for the children they worked with.

The benefits for the educators 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 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

There were some limitations in this research process. The short time spent with the educators 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 findings suggest that using arts-based pedagogies for teaching young children about the environment are effective in a number of ways but may be limited by the capacity of early childhood professionals to employ them, particularly in the areas of music and drama. This has implications for their pre-service education. The experience of the educators 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 findings give rise to new research questions. They point to an association between the children's understanding of the natural world and understanding of social dynamics. This was most evident in 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.

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.

Chapter 4:
Methodology and Design: Research as a Creative, Active Process

Introduction

This chapter describes the design and methodology used throughout the research process. It discusses the theoretical underpinnings of the research design, the recruitment process and the challenges involved in implementing the research. It highlights the multifaceted nature of the interactions with the adults and the children participating in the research including the affect of my involvement in the research process, the multiple modes of data collection and the ways in which the data were analysed.

Orientation and theory

This research project sought to determine the effect of early childhood educators using arts based pedagogies and self generated creative arts experiences to assist young children to learn about the natural world (see Chapter 1 Pages 3 and 4 for specific research questions). Four preschools from a community based management organisation participated, as did their educators and the children with whom they worked. Please see the section on Recruitment in this chapter for detailed information on the participants. The design involved ongoing collaboration between myself and the educators for eleven months in 2009. I visited each preschool monthly and modelled the skills and techniques involved in generating creative arts experiences that reflected the natural world. The educators incorporated the techniques and developed skills in self-generating creative experiences to include content about the natural world into the program for the children. They gradually incorporated additional content about the natural world into their programs (as per their agreement to participate) with the aim of assisting the children to understand their local natural environment.

The orientation of the research method used is qualitative in nature as the interactions between myself and the participants were extensive and needed to be reflexive and flexible enough to evolve over the period of the research, to accommodate new knowledge and additional techniques shared as part of the interactions throughout the research, to identify and evaluate change as it occurred and to respond to it when required. As qualitative research is a process or variety of processes that are used to help the practitioner understand some of the qualities of, or reasons for social phenomena, practice, context or experience in a natural setting, I did not seek specifically to measure or compare. The purpose was more to reveal, interpret, explain or transform social activity (Oakley 1999; Neuman 2003).

This research process encompasses co-constructionist theories as it involves participants developing and implementing new skills and techniques and evaluating the outcomes according to their own current professional knowledge base and experience (Crotty 2003; Greckhamer & Koro-Ljunberg 2005). The aim was for educators to be able to continuously integrate and evaluate the new knowledge gained and to have complete discretion about the extent to which they incorporated the new techniques and creative experiences into their programs. These decisions were made based on their professional knowledge of what was appropriate for the children with whom they worked and what they believed was compatible with the other aspects of their educational programs. Given the reflexive nature of the involvement of the educators, this project could be considered a practitioner-oriented action research process (Carr, May & Podmore 2002; Ponte, Ax, Beijaard & Wubbels 2004; Moran 2007; Arktoft 2008; Groundwater-Smith 2008) albeit a researcher facilitated one. This is particularly so when one considers the ongoing evaluation being conducted by the educators, and the variation to their approach as a result of their evaluations over time (see Chapters 5: Research: Creative Collaboration and 6 and 7: Findings/results: Educators' and Children's Emerging Voices).

As a researcher I was involved with the participants once per month for the duration of the academic year. Given there were only four sites, this could also be seen as a case study approach or case study reporting style as the long-term, ongoing interactions with the educators and children allowed for me to develop rich data resulting in a deep understanding of the experiences of the participants and the meanings they made from them. The relationships that developed were collaborative and consultative allowing for the voices of the educators and children to emerge and resulted in a wide variety of records from which reasonable inferences can be made (Stenhouse 1988; Sturman 1997). As the section on data collection and analysis below shows, the multiple methods used for analysis and inferring outcomes were strengthened further by participant verification. This helped to ensure that the inferences made by me and recorded in the manuscript were representative of the understandings the participants developed during the study, and of the motivation for their actions (Robinson & Lai 2006).

This research is also informed by socio-cultural theories as it acknowledges and builds upon the socially and personally situated knowledge and experience of the participants – both educators and children (Freebody 1992; Fleer, Edwards, Hammer, Kennedy, Ridgway, Robbins & Suman 2006). From the beginning, this project required the educator participants to engage with additional perceptual lenses through which they could interpret the knowledge they already had about the natural world, that is by exploring the different ways of knowing or interpreting through the arts (Curtis 2007).

These ways of knowing called upon the educators' propositional knowledge, affective or emotional responses or feelings about the natural world and their understandings related to physical activities encompassed by the arts media used throughout the research. The extent to which these arts media assisted the participants to engage with the research was dependent on their existing levels of skill or involvement in them and their confidence in engaging in them. As this would vary in any group, it was necessary to engage with a broad range of arts based experiences to ensure all participants had a range of creative expressions available to them.

This project embraces critical theory (Luke 1988; Jones & Miles 2001; Neuman 2003) and critical realism (Bourdieu 1990) as the participants were part of a process whereby they were re-assessing their own values, the educational values and paradigms through which their early childhood programs were developed, and their roles as socially and environmentally responsible citizens. Ultimately, their aim was to effect change in their everyday practices and this had to be weighed up with their responsibilities for implementing the curriculum recommended by the managing organisation and that which they knew to be 'normal'. The structural and political constraints were also apparent when it came to the funds available for resources or the time required to collect them outside of work hours.

A key group of theories that are encompassed by this research are those that advocate for a greater connection between humankind and the environment. As detailed in the Literature Review section of this thesis, they include theories that champion the rights of all life forms such as deep ecology (Seed, Macy, Fleming & Naess 1988; Naess 1989), those that highlight the interconnectedness between man and nature such as biophilia (Wilson 1984), and those that consider that connection with the natural environment is key to healthy psychological development – ecopsychology (Macy 1995; Roszak, Gomes & Kanner 1995; Shepard 1995; Feral 1999; Roszak 2001; Capra 2002).

Research design

This research project does not neatly fit into one category. On the one hand it follows a practitioner or action research process as the participants followed a well recognised sequence of identifying an issue, testing assumptions, gathering data, identifying change processes, implementing change actions, and evaluating the outcomes throughout the year and in between research visits (Kirova-Petrova, Alber & Briod 2000; Carr et al. 2002; Arktoft 2008; Groundwater-Smith 2008). This process was implemented by the educators under the auspices of affecting a gradual change process for themselves, particularly with regard to their capacity for scaffolding young children's understandings of the natural world through self-generated arts based

program experiences. However, as researcher, I was also scaffolding the educators' knowledge of researching the natural world and creatively interpreting and presenting the natural world through self generated creative activities, thereby rendering the research as a two tiered process. This is consistent with what Ponte et al (2004), refer to as facilitation by teacher educators. There was also ongoing evaluation of my role and this was reflected in the change process, the ways in which I influenced the educators and the children, and the inferences they drew from my modelling processes as the 'expert' (Bourdieu 1990). While these influences are an inherent factor in the research, they are fully articulated in the Findings/Results sections of this thesis (see Chapters 6 and 7). These sections of the document clearly show that ongoing feedback from the educators and/or the children influenced the areas of focus in the subsequent modelling sessions.

This research posed two main research questions (See Chapter 1, pages 3 and 4). In order to answer these questions it was necessary for the educators to engage in the development of creative arts experiences and to use them to include content about the natural world in the early childhood program in their settings. This required the educators to participate in processes that were new for them, allowing the repeated practice of these processes to precipitate ongoing change, and to evaluate that change. This necessitated the use of an action or practitioner research model. In collaboration with the four educators, I developed a model where I visited each preschool for three hours once per month, for a period of eleven months.

During these visits I demonstrated a range of techniques for the educators for researching the natural environment and creatively rendering the content into arts based experiences for the children, with the aim of assisting them to do the same. The content about the natural world was based on topical flora and fauna, or specifically on the children's interests (where they were apparent) of the flora and fauna of their local area. The content was expressed in all sessions through storytelling and a variety of other creative experiences such as songs, verses, drama, movement, painting, drawing, sculpture, games and child initiated play.

The educators were initially observers and participants until such time as they became the initiators of the experiences. The effectiveness of the arts in helping participants to understand content about the environment is highlighted by Capra and Curtis (2002; 2007) who emphasise the importance of participation in preference to passive observation. Where time was available, I also met with the educators to unpack the session that I conducted with the children (and with them) so that they could use similar processes to develop their own creative experiences for the children that contained the information and content about the natural world that they wished to convey.

This process initially involved me acting as a specialist educator for both the children and the adults. The intention was that after a period of time the educators would employ similar techniques to incorporate content about the natural world into their programs both when I visited and in between visits, and that my contribution would become that of a facilitator rather than a presenter. As I conducted the research and provided the information and models for developing self-generated creative activities, this research was essentially a researcher facilitated action/practitioner research design.

Given that there were four sites only and the interaction with each of them was regular and ongoing for a significant period of time, this study also lends itself to being described as a case study (Reis-Jorge 2007). A case study can be described as a type of research that gathers data directly from individuals (in this case individual sites) in their own environment in order to study interactions, characteristics of groups or individuals, and attitudes (Sturman 1997). The case study method is therefore consistent with the design of this project, particularly for reporting on the experiences of the participants.

Recruitment

Initially it was intended that the research group consist of approximately 10 early childhood educators and that they attend evening workshops on a monthly basis. Given the specific nature of the subject matter and the pressures on educators to cover such a wide range of curriculum topics (Cutter-Mackenzie & Edwards 2006), participation in this research would most likely be welcomed by those who had a commitment to environmental education. The level of involvement also necessitated a willingness on the part of the participants to commit to the time and change processes inherent in it the research (Rodd 1997; Henderson-Kelly & Pamphilon 2000; Shoemaker 2000). Similar to the pilot project (see Chapter 3) this meant finding participants was more likely to be achieved by pursuing professional connections where there were related interests (Graue & Hawkins 2005), i.e. environmental education in early childhood. In pursuing this route I attended a number of meetings and presented at the New South Wales Early Childhood Environmental Education Network forum. While there were a number of early childhood educators very interested in participating, there were insufficient who were willing or able to attend monthly workshops outside work hours. This is not surprising given the ongoing demands experienced by early childhood educators (Kelly & Berthelsen 1995; Noble & Macfarlane 2005). The model of implementation had to change to accommodate the needs of the intended primary participants. However, as a result of my presentation there were three preschool educators who expressed interest in working with me only if a method could be found

that did not place undue pressure on their out of work hours time. All three preschools were run by the same managing organisation who invited me to conduct an additional seminar and advertise it in their regular newsletter to ascertain whether there was any further interest. This resulted in an additional (fourth) educator from another preschool coming forward and we began to look for a means of working together that would accommodate their work schedules and mine.

The four preschools were all run by the same community based organisation and were all based in Sydney. Two were situated in the southern fringes of the city, one in the inner west, and one in the northwest. All four preschools had just completed a year long project on sustainability in early childhood settings that focused on practical activities such as composting, recycling, worm farms and gardening, and the educators wanted to extend on the ways in which the environment became part of their program.

There were four educators representing the four separate preschools. Table 4.1 shows the preschools and the participating educators.

Table 4:1 Numbers of educators in the preschools

Preschool	Number of rooms	Educators in the participating room	Support educators in the participating room	Educators participating from other rooms
1	2	1	1	1
2	1	1	2	
3	1	1	2	
4	2	1	1	1

The teacher educator was in all instances degree qualified and had ten or more years experience. Two of the teacher educators had twenty years experience. Of the six support educators, one held a diploma level qualification, one a certificate and the remaining four were untrained. All of the untrained support educators had ten or more years experience with one support educator having twenty years experience. There were between twenty and twenty-five children enrolled in each of the educators' rooms on the days I visited. The children were between three and five years old. Most of the four year old children, who turned five later in the year, were returning for their second year at the preschool.

The community and family demographics across these preschools represent diverse cultural, economic and social groups. None of the preschools could be said to have been markedly different in any of the three criteria mentioned above. The inner west preschool was situated in an area with few pockets of un-built or green space around it, whereas the other three were on the city fringes and close to regional or national

parks or significant environmental areas. The only challenge presented by this at the beginning of the research may have been that the educators in the inner west preschool had fewer immediate examples of natural flora or fauna to inspire their work, or that the children may have been less forthcoming in expressing their awareness or interest in the natural world. The variations in approach that were used to allow for this were minimal and are described in Chapter 5.

Each of the preschools were provided with the same information sheets for educators and for families, the same consent forms and the same questionnaires (see Appendices 1.1 to 1.7). These documents clearly explained the purpose of the research and the level of involvement for the educators and for the children and, where relevant, for families (such as family surveys).

Ethics

This doctoral project required ethics approval through the new National Ethics Application Form web based process. It required the following key elements:

- Information letters for educators (Appendix 1.1) detailing the purpose of the research and the anticipated outcomes. These information sheets also detailed the way in which the educators and the children would be involved.

- Signed consent forms for educators (Appendix 1.2) that included opportunity to itemise their consent for a variety of aspects of the program, including video recording and the uses to which data may be put. All educators' names would be changed and they would be unidentifiable beyond the region in which their setting was located. Consent could be withdrawn at any time without offering a reason. All educators gave their consent for all aspects of the program.

- A questionnaire for educators (Appendix 1.3.)

- Information letters for families (Appendix 1.4) detailing the purpose of the research and the anticipated outcomes. These information sheets also detailed the way in which the educators and the children would be involved.

- Signed consent forms for families (Appendix 1.5) to provide their consent for their children to participate in the research process. This included all aspects of the process and detailed the possible purposes to which the data collected may be put. All children's names would be unidentifiable beyond their first names and the region in which the preschool they attended was situated. Consent could be withdrawn at any time without offering a reason.

- An optional questionnaire for families (Appendix 1.6).
- Signed consent from the community-based organisation (Appendix 1.7) managing the preschools participating in the research. All sites would be unnamed and be identifiable only through the region in which they were located or though a designated number (preschools were numbered 1 to 4 during the findings and analysis stage.
- A risk benefit analysis showing that the benefit to the participants outweighed any burden. The only burden for the educators was seen as a potential increase in time taken to develop creative experiences for the children. This was outweighed by the development of new skills and techniques for researching and presenting information about the natural environment in a creative manner.
- Offers to attend parent meetings to discuss the research and the way in which it would be implemented in the preschool. This occurred at Preschool 4 in the southern fringe area of Sydney.
- Ongoing verbal permission was also sought from the children about their participation. In particular, children were asked for their consent prior to filming any aspect of their individual engagement in the research project.

Additional ethics considerations related to working with young children

There are number of additional ethical considerations when conducting research with young children and this research incorporated sincere attempts at working within contemporary ethical understandings and recommendations. The United Nations Convention on the Rights of the Child (1989) declares that all children, capable of forming their own view, should have the right to express them in all matters that affect them. There were two ways in which I sought to ensure that children participating in this study could exercise this right.

First, all educators involved in the study were consulted to ensure that where the children did not wish to participate in the sessions being conducted, they could engage in other activities that would be appealing to them. This was also conveyed to the children. The educators were also present during all sessions and were acting in accordance with their obligations to ensure the wellbeing of all children (Coady 2001; Australian Early childhood Association 2006). Secondly, in addition to obtaining consent forms from all adults involved in the research process, I sought consent or informed assent (Morrow & Richards 1996) from the children both at the beginning of the study and during each visit. This involved explaining in an age appropriate manner

the nature of the study and what I intended to do with the data obtained. I also asked the children, during each visit, for their consent to video them, take photographs of their artifacts or to takes notes of our conversations. This represented an ongoing series of consents where the children had the right to participate or to engage in other activities of their own choosing (Cuskelly 2005).

The other key consideration is that there was no obligation on the part of the children to express views or actively contribute to data collection although they were welcome to do so if they so wished. The methods of data collection were based on observing or recording the children during a variety of activities with which they were familiar and comfortable such as play, creative arts experiences and conversation. This multi-method approach provided a number of types of data that highlighted the voices of the children and was consistent with a participatory approach to research with young children (MacNaughton & Smith 2005).

Data collection

The data collected was varied, represented a range of media and was gathered by the educators and by me. The multiple modes of data collection were appropriate from the perspective of the educator participants, which reinforced that the design of the research aimed to minimise the burden on them by using data they collected as a normal part of their practice. This had the benefit of facilitating the implementation of the research, and validating the methods the educators use for data collection. The multiple types of data I collected were intended to show completeness of data and provide assurance about the findings, and they were consistent with the types of data collected by the educators. These data collection methods and the two points of collection (me and the educators), the four sites over which they were collected and the varied times at which they collected, are consistent with and verified by theories of method and data triangulation (Silverman 2000; Denzin & Lincoln 2003; Silverman & Searle 2005).

The educators' data included journal entries recorded in hard copy or on computer, still photographs and anecdotes. It also included creative artifacts they created such as verses and a song, and creative artifacts from the children such as drawings and paintings. The data I collected included video footage of either me or the educators presenting the sessions for the children, songs, voice memos, still photographs, hard copy records of phone calls prior to and after the sessions, emails from and to the educators, an educator questionnaire and a family questionnaire. This data also included session planning notes and written reflections after the sessions. For a month by month chart of data collection see Appendix 2. Each of the data modes is discussed in detail below.

Questionnaire

A questionnaire (see Appendix 1.3) was used on two occasions to provide a snapshot of the educators' beliefs and values (Burns 1996) regarding the natural world and their role as educators in including this topic in their educational programs. The first questionnaire (Round 1) was completed two months into the research and the second (Round 2) was completed in the final month and up to two months after the end of the research. I anticipated that the educators' responses to the questions would vary throughout the period of the research and wanted to ensure that these variances were captured in their own words as they would represent a rich source of data (Goodwin & Goodwin 1996). One of the disadvantages of using the questionnaire was that the open ended questions contained within it solicited non standardised answers and required framing or coding prior to use (Wadsworth 1997).

The questionnaire focused on what the educators believed environmental education was, why they thought it was important, what they saw as the benefits for children and the community, what the preschool environment could do to foster environmental understandings, and what they as educators currently did in their own programs. As this research involved change processes for the educators, using the same questionnaire on two occasions helped to examine whether the attitudes or opinions of the educators had changed as a result of their participation in the research process. This acknowledges that the educators were involved in a process of developing additional knowledge and skill about the natural world, about ways of researching and interpreting it, and about developing creative experiences to share with the children in their groups.

An additional requirement of participants in this study was the need to develop self-generated creative experiences including stories, songs, verses, drama, movement and visual arts experiences as a regular part of the program. The questionnaire also sought to capture the possible affects this skill development and expansion of creative expression had on the educators and on their attitudes toward environmental education.

Questionnaires were also available for families. A copy of the questionnaire is included in Appendix 1.6. These questionnaires were optional for families and were designed to give some background information about the attitudes of family members toward the natural environment. It was also considered that the responses to this questionnaire may provide additional information about the children's exposure to the natural environment which may help to inform the educators and me about the children's predispositions to particular topics based on the natural world. It asked questions about the family member's memories of being in the natural environment as a child,

the kinds of natural settings they were exposed to, and what they thought might be the outcome of these experiences. It also asked about their child's experiences of the natural world, the similarities or differences to their own and what they thought the reasons for these similarities or differences were. There was a question about the current family opportunities to spend time in the natural environment and the reasons they did so. The responses to these surveys could also be useful for identifying any unforseen major variables in the sociocultural knowledge or background of the participants in the research.

Video footage

Video footage was used to ensure that the educators' and children's interactions with the program were captured accurately for each of the sessions delivered throughout the year. This data provided comprehensive and time sensitive examples of practice with an immediacy and emotional authenticity that is a feature of the video medium (Belisle 2006). The disadvantage of using this method was that the volume of data required detailed sorting and categorising to make it useful and specialised equipment was needed to make this possible.

The video footage provided information in a variety of ways. First, it recorded the sessions presented to the children; both mine and those developed and implemented by the educators. The story that introduced each session was filmed, documenting information about delivery, content and timing. The children's responses and participation in the story were also a feature of this footage and this provides a good overview of the children's level of engagement with the process.

Second, the video footage shows the creative experience that followed each story. These experiences exemplified in some way, depending on the creative media being used, aspects of the story or the characters within it. This footage provides useful information about the extent to which the children and their educators were able to express elements of the story through the various media used. It provided information about the level of confidence the educators had in the different creative media, highlighting areas where I could offer feedback or support as part of the action research process.

Last, the video footage provided an opportunity to record the artifacts within the rooms. The displays, in each of the four preschools, changed throughout the year and showed the topics of interest and the ways in which they had been dealt with. This documentation, inspired by the topic in focus, varied in media and captured the many and dynamic iterations of meaning expressed by the educators and the children (Gandini 1993). This was of particular significance as this was information about what

happened in between research visits and showed the extent to which the educators embraced the process as an ongoing relevant part of the their programs (Van Hoorn, Nourot, Scales & Alward 1993; Puckett & Black 2000; Carr 2001; Feeney, Christensen & Moravick 2002).

Researcher journal

Researcher journals are a recognised form of gathering records in qualitative research and can be used to record observations, conversations and anecdotes. They can encourage the researcher to be systematic, focused and reflective (Robinson & Kuin 2006). They were also useful in ensuring I was responsive to the needs of the children and the educators.

My journal consisted of written notes and voice recordings. For the first 4 to 5 months of the research I kept written reflections about each visit. They captured my reflections about the success of each visit, the overall tenor of the visit and the response from the educators and children. The following criteria were used as indicators of engagement:

- Were the children asking questions about the content or the experiences?
- Did the children appear curious about the processes they were involved in?
- Was it difficult to maintain the children's enthusiasm for the experiences?
- Were the educators relaxed about the content and experiences?
- Did the educators ask questions about the content or experiences?

My notes also detailed any questions asked by the children or educators, where they were not caught on video. These reflections were reviewed prior to each subsequent visit, providing a link to the outcomes of the month before and contributing to the planning process for the upcoming visit.

There were times throughout the research where the demands on my time at work made writing reflective notes difficult. To ensure I was not losing valuable and fresh reflections, I took to recording 6-10 minutes of verbal reflections immediately upon leaving each visit. These reflections contained the same type of information and performed the same function as the written notes described above.

Prior to planning each visit I also rang each of the preschools to collaborate with the educators about what the content of the visit would be, the creative media that would be in focus and what my role would be. I made brief notes of each of these calls to record the main points.

Both the written and the audio reflections were reviewed prior to ringing the preschool educators to plan the next visit. This ensured a continuity of content and process for myself and the educators and also provided an opportunity to assess the extent to which my reflections were aligned with the perceptions of the educators (Ponte et al. 2004).

Data collected by the educators

Collecting information about children, their development and the programs offered in early childhood settings is good practice (Carr 2001; Carr et al. 2002; Feeney et al. 2002; Faulkner, Hughes & Swift 2004; Arthur et al. 2008). It is also a requirement for compliance with licensing and accreditation standards. There are a variety of accepted procedures for collecting data and they come under the following categories: written records, aural (either with written notes to record them or voice recordings), pictorial and audiovisual. The educators in this research project had their own preferred methods of recording information about the children and their programs. They included learning stories (Carr 2001), photographs, work samples, anecdotes and journal entries (McAfee & Leong 2002).

Each of the preschools provided different combinations of records depending on the methods used by the educators. These records were contained in child portfolios which included a mixture of photographs, anecdotes and observations, and work samples.

Data analysis

Analysis of these different types of data required a systematic approach. The first build up of data occurred with the video footage as I was using this process of recording for every session. The volume of video data was considerable after the first two months of the research process and required a system of management that would also be useful for considering the written records, photographic records and artifacts. A data framing code gradually emerged and with it an imperative for it to relate to the multiple types of data to strengthen the triangulation (Silverman & Searle 2005) and corroboration of the data.

The data framing code emerged as I began a process of reviewing the video footage and the journal notes each week. Common themes began to emerge representing specific types of information. After the first two months this information consolidated into categories under which I saved sub clips and journal notes where they were consistent. This represented a preliminary coding process (Miles, Mathew & Huberman 1984). The data categories were adjusted over a three month period in consultation with the educators and with my supervisors, and as a result of monitoring the relevance

of the categories against the incoming raw data from all sources. The data categories were confirmed after the three months of data monitoring and through final consultation with the educators and with my supervisors. This was an iterative process that moved between the research design and implementation and helped to ensure methodological coherence (Morse, Barrett, Mayan, Olson & Spiers 2002).

The data categories (see Table 4.2 below) were placed at the front of a book provided to the educators in each of the four preschools. In addition to being invited to suggest amendments to the categories (or indeed suggest new ones) the educators were asked to add or record any relevant specific observations, anecdotes, photographs or work samples related to the children's or their own participation in the research. The data categories were lettered in order to provide the educators with the option of using the letter only as a quick form of coding on the record being archived.

On analysing the findings it became apparent that the data categories bore relationship to one or other of the research questions about the educators or the children, through the sub questions that they had given rise to. The way in which they were related is shown in Table 4.2 below.

Table 4:2 Relationship between research questions, sub questions and data categories

Research Question 1	Sub questions	Data categories related to educators
In what ways can self-generated creative arts experiences assist early childhood educators to support young children to learn about the environment?	Does working through the arts assist the educators in incorporating information about the natural world into the program for the children?	· Educator awareness of how the arts can be used to extend children's understanding of the natural world · Educator awareness or examples of how the arts can be used to explore and represent the natural world
	In what way will the educators' research on flora, fauna and natural phenomena, and their subsequent development of creative experiences for the children, affect the educators' understandings of or attitudes toward the environment?	· Using analogies of interactions in the natural world to characterise social dynamics · Expressing knowledge about the natural world through the arts that contain emotive elements · Using natural materials creatively
	In what way does working through the arts to develop experiences for the children about the natural world or the environment, affect the educators' sense of connection with their local environment?	· Educator's complex or integrated awareness of their local natural environment

Research Question 2	Sub questions	Data related to children
What are the benefits for children of experiencing creatively presented material about the natural world as regular content in the early childhood program?	Are there changes in the ways in which the children express their understandings about the environment after a period of using creative arts experiences to support learning about the environment?	· Reflecting concepts/ expressing understanding of the natural world through play and interactions · Expressing complex understandings of the natural world · Using natural materials creatively
	Are there changes to the way in which the children behave toward the natural world or environment?	· Acting in a manner that shows care of/regard for the natural world · Expressing concepts of care/compassion/nurture introduced through program content
	Are there any differences in the interactions between the children that can be attributed to the regular experiences of creatively presented information about the natural environment?	· Interacting in ways that show new or changed social/group dynamics. · Using analogies of interactions in the natural world to characterise social dynamics

The data from the educator questionnaires was initially recorded separately as it represented samples taken at the beginning and at the end of the research process. A table of comparative responses appears in Appendix 4. This data was then integrated into the analysis of the findings for the educators and the children, where it related to the research question and data category. For the tables that show the relationships between the research questions, sub questions, data categories and educator survey responses, see Table 8.1 for responses related to the educators and 9.1 for responses related to the children.

Validity

There are a number of mechanisms and procedures that can be used to show research validity. My intention here is to show validity through Creswell and Miller's (2000) model of 'Validity Procedures Within Qualitative Lens and Paradigm Assumptions' (p. 26). This model provides a framework that highlights the lenses of the researcher, the educator participants and my academic supervisors within three differing paradigms: post positivist, constructionist and critical. As my various data collection methods detailed in the previous section bear relationship to one or more of these paradigms, they can be tested or substantiated within the model being used.

The records referred to in the Data Collection section were used to inform the findings.

They are multiple in type and were cross referenced to ensure that the inferences made were substantiated through triangulation of two or more modalities (Creswell & Miller 2000; Silverman 2000; Denzin & Lincoln 2003). In addition, the findings were shared with the educators who participated in the research project to ensure that the inferences made about them in answering the research questions were valid. Where the perspectives of the educator participants showed my inferences to be inaccurate, revisions of the findings were conducted or comments highlighting their differing perspectives were included in the findings. The educators were also invited to assess the extent to which they believe the inferences made about the children, as they pertain to the research questions, are valid. This ensured that the lens of the researcher was not the only perspective and satisfies the validity procedure outlined by Creswell and Miller whereby the lens of the researcher is complemented by the perspectives of the participants *and* of people external to the study (see Table 4.3 below). For the purposes of this thesis, the external perspective was gained from my supervisors and examiners. Where there were no specific comments in response to the reflective questions the educators were asked about the findings (see Appendix 1.8), the absence of feedback has been taken to mean that the findings were not incorrect. The educators were aware that this approach would be taken. These three perspectives are validity procedures seen through the lenses of the researcher, participants and those external to the study within what Creswell and Miller call a post positivist or systematic paradigm.

Creswell and Miller (2000) also articulate validity procedures within constructivist and critical paradigms (see Table 4.3 below). Validity procedures for the researcher for the above paradigms respectively include disconfirming evidence and researcher reflexivity. Disconfirming evidence was used as a checking mechanism once the categories for classification or coding of the data were established to ensure they were appropriate. The requirements of researcher reflexivity can also be claimed as my role in the research process is highlighted throughout this thesis, including in the assumptions and values that underpin it. The validity procedures for the educator participants that relate to prolonged engagement and collaboration in the constructivist and critical paradigms described in Table 4.3 (below) can also be demonstrated throughout this research process given that the engagement in the field was a minimum of nine months and involved constant collaboration as described in Chapters 5, 6 and 7.

With regard to the external participants lens, within the constructivist and critical paradigms, is what Creswell and Miller refer to as thick or rich descriptions and peer debriefing respectively. The thick or rich descriptions provided in the implementation and findings chapters will be a key component of the information used by my supervisors to review and provide feedback about the inferences made in the findings. The multiple forms of data and the descriptions of the ways in which they were

gathered and interpreted will offer a deep insight into the processes used and the understandings developed by the researcher as a result. The peer debriefing process is one that involves feedback from my supervisors and to a lesser extent, the examiners. This involves someone who

> *... provides support, plays devils advocate, challenges the researcher's assumptions, pushes the researcher to the next step methodologically, and asks hard questions about methods and interpretation (Guba & Lincoln 1994, cited in Creswell and Miller 2000 p. 129).*

The key data sets and qualities of enquiry that help to ensure reliability and validity in this research process are:

Table 4:3
Validity procedures within research paradigms (Creswell & Miller 2000 .p 126)

Paradigm assumption/Lens	Postpositivist or Systematic Paradigm	Constructivist Paradigm	Critical Paradigm
Lens of the Researcher	Triangulation	Disconfirming evidence	Researcher reflexivity
Lens of Study Participants	Member checking	Prolonged engagement in the field	Collaboration
Lens of People External to the Study (Reviewers, Readers)	The audit trail	Thick, rich description	Peer debriefing

- A consistent set of information documents across sites
- A consistent questionnaire used across sites at the beginning and end of the visit schedule
- Ongoing collaboration with educators prior to and after each visit
- Consistent video footage of every visit at every site
- A wide variety of records from each site consistent with good practice in the early childhood education sector
- Collaboration with educators on the findings and revision where relevant
- The period of time over which records were collected – eleven months with nine to eleven visits per site.

There are limitations to this research project that will affect the generalisability of the findings. They include the number of sites and the fact that all sites were in one city – Sydney, Australia. However, the close interaction with each of the sites and the time frame over which records were collected provided an opportunity for in-depth interpretation of data and show the extent to which participation in the research

project did effect change and provide answers to the research questions asked. Although the findings are not broadly generalisable, the processes used to achieve them are informed by rich data, consistent with that required for case study style investigation (Sturman 1997).

There is also scope for questioning the content of the records made of the conversations that occurred with the educators, prior to the conclusion of each visit. The lack of time available to formally interview the educators and ask consistent questions about the effects of the visit, across all sites after each visit, meant that the main topics of conversation, about which the written or verbal reflections were made, were those that were uppermost in their minds. However, this 'naturally occurring data' (Silverman & Searle 2005, p. 119) also shows a consistent process of interaction and highlights the ongoing nature of the collaboration that became an integral part of planning for the content of each subsequent session. Aspects of these conversations and how they relate to the implementation of the research will be discussed in Chapter 5.

The living curriculum : a natural wonder : enhancing the ways in which early childhood educators scaffold young children's learning about the environment by using self-generated creative arts experiences as a core component of the early childhood program / K.S. Ward

Chapter 5 can be viewed on CD-ROM at UWS Library (this is owing to the large file size of Chapter 5)

The living curriculum : a natural wonder : enhancing the ways in which early childhood educators scaffold young children's learning about the environment by using self-generated creative arts experiences as a core component of the early childhood program / K.S. Ward

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Chapter 7 can be viewed on CD-ROM at UWS Library (this is owing to the large file size of Chapter 7)

Chapter 8
Analysis: A Spectrum of Colours: Educators

The analysis of the findings are reported in Chapters 8 and 9. This chapter reports on the analysis in relation to educators and Chapter 9 reports on the analysis in relation to the children.

This chapter analyses the results and findings related to the educators as referred to in Research Question 1 and the three sub-questions contained within it. These sub questions are used as headings to frame the interpretations of the findings throughout this chapter and the sub questions for Research Question 2 are used as headings in Chapter 9. The relationships between the sub questions and the data categories used in Chapters 6 and 7 is shown in Tables 8.1 and 9.1 respectively.

This chapter also highlights emerging themes and discusses their relationship to the research questions. To draw inferences about the effect of the research process, information comes from the various types of data reported on in Chapter 6 and from the relevant survey questions, a copy of which can be found in Appendix 1.3. The educators answered the survey questions on two occasions and I have named these Round 1 and Round 2. The first round questionnaire was completed in the first two months of the research visits, and my interpretations of the responses from this round are included in Stage 1 of the information contained under each sub-question (heading) below. The second round of the survey was conducted at the end of the research process, either in the last month or in the two months following the final visit, providing an opportunity to compare the responses (for a full comparative table of the responses to the survey questions see Appendix 4). Interpretations of Round 2 responses appear below in the information contained under Stage 3 of each of the sub-questions (Headings). The survey questions were initially designed to provide a contextual platform that would articulate a base-line of information about the educators' beliefs and values regarding the natural world, and about their roles as educators of young children on this topic, both at the beginning and the end of the research. They were not specifically designed to answer the main research questions. However, the responses to them are useful as additional information and contribute to the inferences I have made. Table 8.1 shows the questions that I have linked to the research sub questions and in turn, Research Question 1.

Table 8.1 Links between Research Question 1, sub questions, data categories and survey questions.

Research Question 1	Sub questions	Data categories related to educators	Educator survey questions considered
In what ways can self-generated creative arts experiences assist early childhood educators to support young children to learn about the environment?	Does working through the arts assist the educators in incorporating information about the natural world into the program for the children?	• Educator awareness of how the arts can be used to extend children's understanding of the natural world • Educator awareness or examples of how the arts can be used to explore and represent the natural world	4. What role does/can the preschool environment and the programs they offer play in enhancing children's understanding of the natural world? 5. What skills/ understanding does a childcare professional need to assist children to understand the natural world? 7. What strategies do you currently incorporate into your program to assist children to learn about the natural world? 8. What effect does this have on the children's understanding of the natural world?
	In what way will the educators' research on flora, fauna and natural phenomena, and their subsequent development of creative experiences for the children, affect the educators' understandings of or attitudes toward the environment?	• Using analogies of interactions in the natural world to characterise social dynamics • Expressing knowledge about the natural world through the arts that contain emotive elements • Using natural materials creatively	6. How/where do *you* develop your understandings about the natural world?
	In what way does working through the arts to develop experiences for the children about the natural world or the environment, affect the educators' sense of connection with their local environment?	• Educator's complex or integrated awareness of their local natural environment	9. What language/ words/concepts do the children use when they talk about the natural world? 11. How is the local community and environment related to a child's understanding of the natural world?

The main research question related to the educators was Research Question 1: In what ways can self-generated creative arts experiences assist early childhood educators

to support young children to learn about the environment? This question has been approached here by breaking it into three sub-questions. These are articulated below as headings. Each of the sub-questions contain subheadings: Stage 1, Stage 2 and Stage 3. These stages reflect the beginning three to four months, the middle three to four months and the final three months of the research field visits.

Does working through the arts assist the educators in incorporating information about the natural world into the program for the children?

Stage 1

To create a beginning point, the discussion will examine the educators' responses to the survey questions as the Round 1 responses provide data about the educators' incorporation of information about the natural world prior to, or in the beginning of, Stage 1 of the research process. In particular, the questions that relate to what the preschool program did to support children's understandings of the natural world (question 4), what skills educators need to do this (question 5), the strategies they used to incorporate this information into the program (question 7) and the effect they had on the children's understandings (question 8), provide insight into the methods that educators used.

Analysis of the survey data from Round 1 indicates that the educators all had strategies for integrating environmental experiences into the preschool program. They incorporated many practical strategies to support environmental awareness, such as gardening, composting, recycling, and discussing sustainability, believing that these experiences teach children that 'the environment is their responsibility'. Having inviting natural spaces in which to play and spending time outdoors were also seen as important for encouraging curiosity about the environment. Encouraging observation of plants and animals was cited often and encouraging a sense of wonder in children was also seen as important. Children's interest in the natural world, for example life cycles, was also a feature, with one educator citing the need to start with what the children know and work from there.

When asked about the skills that an early childhood educator needed to assist children to understand the natural world, the responses covered a range of practices including an understanding of sustainability practices, passion for teaching this to children, and an appreciation of and respect for nature and living things. Knowledge of the environment was a required skill for many. One educator mentioned the ability to research topics as they arose as important and another the knowledge of where to look for information. For one educator, knowledge of the environment included using correct terminology. Having a positive attitude towards the environment and being able to frame open-ended questions

that encouraged children's curiosity and investigation were also seen as important. The educators believed that the effects the application of these skills and strategies had on the children included fostering a sense of respect, curiosity and enthusiasm for nature, making learning about nature fun and memorable, and fostering a sense of responsibility toward nature. This was also consistent with responses in the family questionnaires where parents said they wanted their children to learn more about nature, to develop a love for it, and to learn to look after it.

The responses cited above all point to a positive attitude toward the natural world and a commitment to teaching children about it. This is to be expected in early childhood settings where there is an explicit and publicly stated commitment to sustainability and environmental education, as there was in each of these preschools, and indeed in the managing organisation. Based on the information from the Round 1 surveys, the practical application of this commitment in each of the preschools appears to be pragmatic as they relate to gardening, composting and recycling. There were also less tangible interactions with the natural world such as observation of insects, flora and fauna and discussions about them. The educators' survey responses in Round 1 did not mention the use of creative arts-based experiences as part of their program or as part of the strategies they used to support environmental understandings in the children. There was also no mention of the skills that an educator might need in relation to creative arts based experiences.

However, the educators were open to the concept of information about the natural world being conveyed through the arts when I presented arts based experiences. This was evident in the enthusiastic way they introduced the sessions to the children, the way they encouraged the children to participate (participation was voluntary), and the level of animation they displayed in expressing emotions relevant to the story content, movement and music experiences. They also displayed a willingness to creatively reflect the stories by including hand and/or arm actions related to the element or animals when prompted by the story or song. Engaging in whole body movement experiences related to a song or verse, which was specifically about the natural world, was new to all of the educators and initially they did so with trepidation. As this, along with music, was the area in which they all felt most challenged, their active participation reflects their willingness to embrace the arts for conveying information about the natural world (see Movie Clips 6.1 and 6.2, also see Pictures 6.1 and 6.2 in Chapter 6 for evidence). Their commitment is also evident in the experiences they facilitated for the children in-between visits which included drama (one instance in Preschool 4), collages and provision of natural materials for play or specific creative arts experiences.

At this stage, none of the educators felt confident enough to create the stories for the

sessions or the follow up experiences. There are many possible reasons for this. They may have felt exposed in front of their colleagues, as story telling requires a degree of animation and acting skill that is not often expressed, particularly in front of other adults. In fact, one educator told me that she would be fine if it was just the children who were watching. Creating stories to reflect the natural world requires detailed knowledge that is creatively rendered into a story narrative. This is also skill that must be learned. While the educators were competent researchers, turning the facts into stories required additional, flexible and nuanced ways of thinking and imagining the subjects, and an understanding of story development.

Stage 2

By Stage 2 the educators' use of the creative arts to incorporate information about the natural world was becoming more prevalent. They began to plan and implement more of the stories about the natural world and the creative experiences that followed. Early in Stage 2, in two of the preschools, the educators were developing and telling stories based on the natural world and suggesting experiences I could conduct for follow-up, or planning experiences that they could implement such as clay modelling, drawing or movement.

These two educators were becoming more adept in planning the types of experiences that would complement the stories and convey concepts that they felt were relevant for the children. However, they still needed much support and scaffolding to plan and implement creative arts experiences related to the natural world. I collaborated with them on the content of the stories, and on the processes involved in the genesis drawing and sculpture, which were the basis of the intentional teaching (DEEWR 2009) sessions. For example, one educator prepared props for her story about Wilma Wombat, and then led a clay sculpture experience to create a three dimensional representation of the wombat and it's burrow. To create the wombat she made separate balls of clay for the different body components. After the session, we discussed the possibility of using the genesis method of starting with a sphere of clay and fashioning the body parts from the one, whole piece as per a naturally occurring process. She could see that this was a useful way to approach to the modelling process and would keep it in mind. This educator had told a couple of self-generated stories about the natural world by the time of her wombat story and was amazed at the process involved in doing so. Her remark: *'No one ever told me I could tell a story – just go out and research the topic (animal, habitat, plant etc…) and turn it into my own story. It's like a whole world has opened up'* highlights the newness of this experience and the pleasure she took in it. It also reflects a realisation that self-generated stories can be a meaningful and powerful means of communication, containing factual information, models of social interaction and artistic nuances that support additional ways of understanding.

By the end of Stage 2 all of the educators were implementing creative experiences related to the natural world, either during the research visits and/or in between them, and in three of the four preschools they were creating and telling their own stories. The number of episodes and their confidence in connecting topics to the children's interests was increasing. This led to the educators maintaining topics for stories or serialising stories in between visits in three of the preschools. We discussed their stories via email or during the pre-visit phone calls, during which I collaborated with the educators on their in-between sessions with the children, and on the intended content for my visit. They had clear ideas about what the new topic should be, or if a topic from the last visit or from their own work with the children in between visits, should be continued. The process was becoming familiar and the time required to plan or to write the stories was starting to lessen, as was the time required for planning the follow up experiences. In the early stages of story writing, the educators commented on how difficult it was to find the time to research and write stories and as result often asked me to do it with or for them. The difference now, for the four educators (from three preschools) who were engaged in story writing, was that the time taken to create stories and sessions to follow was considered manageable. In reality, the time period was probably not any greater than in stage one, but as the educators had seen a number of their collaborative ideas developed into stories and delivered by me, the idea of doing this was less daunting. In Preschool 1, I was still telling the stories and planning the follow up session, but the educators were engaging the children in creative arts experiences, related to the content of my visits, intensively in between visits.

There were still some educators who found the process of telling their own stories challenging. This had as much to do with being animated with their own story creations in front of their colleagues as with any difficulty with the development of the plot or characters. I discussed this with all of the educators, reassuring them that the self-consciousness that they were feeling would dissipate as they became more practiced and confident. By the end of Stage 2, all the educators had developed and told stories, and had planned or implemented complementary creative experiences. They certainly did use the arts to incorporate information about the natural world into their programs. However, at Stage 2, the educators were still weighing up the effort required for planning and implementation with the amount of 'assistance' these process afforded them in incorporating information about the natural world into the program.

Stage 3

By Stage 3 all of the educators were becoming proficient storytellers, or story animators, when adapted stories were used. Educators from all of the four preschools used told stories in between visits to convey particular concepts or information. In one of the

preschools the teacher educator used published stories and adapted them during my visits, even though she had created and told stories in between visits. This, she reported, was due to being a perfectionist and not being happy with her level of preparation, and to feeling a lack of confidence in her own ability as a story teller. There were a number of occasions where I reassured her of the positive elements to her story creation and telling, and also to her level of animation during the telling of adapted stories. The educators still found the planning and research that was necessary to ensure the characters in the stories were factually based took considerable time. Consequently, the number of stories they created and told in between visits were few (no more than three per month). There was also a tension between presenting factual information and having a creative story that engaged the children's interest. All of the educators were accomplished fact finders and this embedded skill was often at the forefront of their expressions of the subject matter. While factual elements can be drawn, discussed, painted or built, it is more challenging to render them creatively through music, movement or drama. Given that the educators had limited time for developing whole new skill sets, the predominant expressions within the preschools were still those related to the visual arts. As a result, the displays in the rooms were full of drawings, paintings and sculptural items. These were related to the sessions we had done during my visits and during the intervening periods in which the educators conducted creative sessions with the children in a variety of formats. It was clear that the educators were using the arts regularly in their weekly and daily program to incorporate information about the natural world.

The survey results for Round 2 also indicate that the educators felt that the arts were useful in incorporating information about the natural world into the program. Their responses included expanded information about what they felt the role of the preschool was in environmental education, the skills educators needed and the strategies they used (see Appendix 4 for the comparative table). When asked a second time about the role of the preschool in environmental education, their answers included providing natural materials for imaginative play and intentional teaching about the environment through storytelling, drama, music and arts. Including sustainability practices as an everyday part of routines was also reported but this idea was expanded to include integrating the natural world into all elements of the program. Providing an environment filled with natural beauty, and opportunities for play in wilderness environments were also reported as being important for young children to understand their local environment. These responses show that the educators now believed that teaching young children about the natural world involved much more than sustainability practices. They highlight a belief that environmental education needs to be an integrated element of the whole preschool program, crediting the natural world as having a significant role in the development of the whole child.

The fact that the educators reported that intentional teaching about the natural environment was important, is a clear contrast between this teaching pedagogy and that of play-based exploration that minimises specific teacher-directed content. This pedagogy considers play as the key vehicle through which learning occurs and does not impose content of any kind (Catron & Allen 1999; Dockett & Fleer 1999; Hamilton & McFarlane 2005).This was an approach not uncommon in the four preschools, as the educators seldom involved themselves in children's play so as not to disrupt their explorations or the meaning they made from them. The educators' responses also show they felt the arts played a key role in teaching young children about the environment, and that they had developed an understanding the arts could be employed to interpret factually-based content.

The skills they believed educators required in order to assist children in understanding the environment fell into two main categories: detailed knowledge of the local environment and a broad range of skills for teaching children about the natural world. The knowledge of the natural world included an understanding of gardening, the specific creatures in the local area and ecosystems. It also included understandings about the ways in which a strong connection to the environment affects self awareness, self esteem and confidence. One educator went so far as to say that this connection with the natural world would assist the children to have the confidence to 'seize the day' (regarding positively oriented environmental activity). This level of understanding was also cited as way to 'ensure the children are not fearful of the environment'. The teaching skills cited by the educators' responses indicated skills in developing 'lesson plans' that incorporated the children's interests in the natural world, and a broad range of creative arts skills. These responses reflected the skills and practices in which the educators had been engaged throughout the research, and are a clear indication that they found them of considerable value in incorporating content about the natural world into their educational programs.

Consistent with the skills the educators believed were required for teaching children about the natural world, they reported that they now provided natural materials, created natural play spaces with the children, and went on excursions to parks. These elements are all consistent with place-based experiences that help to describe the environment and develop a sense of connection with it (Orr 2005; Sobel 2005). Storytelling and connected visual art, drama and music experiences based on the environment were cited as current practices, as were researching and exploring the natural world with the children and incorporating it into all parts of the program. These strategies are all relevant to developing a detailed knowledge base about the local natural environment and learning to interpret and understand it cognitively, affectively and kinesthetically.

The educators demonstrated that the practices they engaged in throughout the research dramatically increased the ways in which they incorporated content about the natural world into their programs and the frequency with which they did so. This was evident through their artefacts, in a variety of media, and their development of skill in creating and telling stories. Their survey responses and the programs they implemented for the children, and the displays reflecting them, were also evidence of a strong focus on the natural world. The effects of this on the children (see Chapter 9), as cited by the educators, clearly show that they believe this to be important and beneficial. Given that this has been clearly established, it is appropriate to say that working through the arts, in the manner described throughout this research, does assist educators in incorporating information about the natural world into the program for the children

In what ways did the educator's research on flora, fauna and natural phenomena, and their subsequent development of creative experiences for the children, affect the educators' understandings of/or attitudes toward the environment?

The section above has highlighted the effectiveness of using the arts to incorporate content about the natural world into the early childhood program. However, the processes used in implementing this research involved the educators in a wide variety of new practices that were repeated frequently over a long period of time. New practices, repeatedly implemented, are known to develop skills, broaden knowledge and build on developing expertise (Chi, Glasser et al. 1988; Erricson & Smith 1991; Stevenson 1994). The following section examines the effect the implementation of the practices involved in this research program had on the educators' understandings and attitudes toward the natural world.

Stage 1

Participating in this research process involved the educators learning detailed information about elements of their local environment: both flora and fauna. I modelled research processes in Stage 1, and throughout the project I emphasised the importance of the content of the experiences being based on fact and on knowledge of local conditions. All of the stories and the follow up experiences I presented in Stage 1 were based on either facts, such as scale and proportion for three-dimensional sculpture, or observation, such as imitation of the flight of an eagle during movement experiences.

As the research project progressed the educators had ideas to contribute to the stories and the creative experiences that I presented. This involved them developing an increased awareness of the animal, plant or habitat in focus, and at times engaging in additional

research. They were also exposed to additional detail through the stories or through our discussions after them.

Evidence of their research included the way in which the educators used their knowledge of the animal being sung about to exemplify its movement during singing sessions. The educators opened themselves to discussing the natural world in a more anthropomorphic manner as they interacted with children on the topics in focus. They referred to a cockatoo's nest a child was drawing as being cosy and warm, and asked a child if he was hungry like the baby bird in the story. This type of content conceptualisation, combined with the movement, was the first step in adding complementary knowledge or understandings to the facts already determined about the topic in hand and is consistent with Adcock, Ballantyne, and Tooth and Renshaw's (2007; 2009) findings that high school children and/or their teachers deepened their understandings of the natural environment through drama, story or narrative. The building blocks we used from this point were the creative experiences that followed the stories.

Initially the educators were a little hesitant when we engaged in movement/drama activities where we were standing using the whole body. The movement previously referred to was action style movement to songs using the arms and hands only and was well within the educator's comfort zones. Whole body movement imitating animals or elements can be useful in broadening understandings of animals or natural phenomena where rhythm, flow, coordination and sensitivity are key (Tarr 2006; Curtis 2007), and provide additional ways of knowing and experiencing the qualities of the subject. We did not get down on the floor to imitate four legged animals but stayed on two legs upright and focused on the qualities listed above. This was new for all of the educators and represented a different way of understanding the topic. Even the dynamics of the wind, moved to a simple song in Movie Clip 6.2, required comprehending it in a new light, as it was a new way of experiencing and understanding it.

The educators' responses to survey question 6 about how they came to learn about the natural world (see Appendix 1.3) also point to the new way of learning in which they were engaged. Their Round 1 answers contained no references to understanding the natural world through creative investigation of it. The main influences in the educators' environmental understandings were families and environmentally oriented activities or excursions as a child. Spending time in the natural world as an adult and being exposed to environmental degradation through the media, with the implicit 'fear for the future' messages these media stories contained, were also cited. The few family responses also echoed these influences. The responses give a pre or early-research perspective on what the educators believe contribute to understanding the natural

world and identify positive first hand experiences and fear based messages as agents of their understanding. While first hand experiences in the environment are essential in developing an understanding of the natural world and positive attitudes toward it (Roszak 1998; Roszak 2001; Louv 2006; Pyle 2007), the impressions gained from them do not automatically form the basis of an understanding that an educator can use to develop an environmental program for children. The fear-based messages that the educators have incorporated into their understandings are also likely to be a hindrance in them transforming their experiences into positive, creative program content (Macy 1995; White & Stoecklin 2008).

Stage 2

During Stage 2 the educators engaged in research of their local environment in order to develop their own stories and related experiences. They used this research to create stories that contained a vast array of factual information.

For the educators, the inclination when devising and telling stories was to focus heavily on facts. The need to do so is often a perception of educators, who are influenced by the underpinning notions of the program that seeks to assist children in their understandings of the natural world. However, facts can and should be included in the stories but not at the expense of a good narrative, plot and characters (Paterson 1981). Young children are good critics and will respond if a story does not have enough to engage them, and dry facts rarely do for any length of time. The educators and I discussed the balance of fact and narrative in their stories and they made adjustments for future stories where needed. This prompted them in synthesising the information and or qualities of the animal or element that would best represent the topic at hand. It also meant finding the most appropriate ways of presenting the facts in the stories so that they were part of an engaging and enlightening narrative.

The educators at this stage were regularly using language that was anthropomorphic when telling stories or talking about the natural world. It was not unusual for frog to be frustrated at having his toes nipped by yabbies or for a baby duck to be frightened when there was a wedge-tailed eagle flying above. The natural world had become an integral part of their everyday discourse with the children. This use of language about the natural world was consistent with the respectful and responsive interactions the educators had with the children on a daily basis, but the content now included regular references to the natural world - partly because there was always something from the natural world in focus to talk about. This use of language and regular discourse reflects a metacognition that encompasses the subject matter (Halliday 1985; Luke 1993, O'Brien et al. 1994; Stables 2006). The educators also represented facts about the

animal, plant or habitat through various media. For example, the educator in Preschool 4 developed a good understanding of a wombat's proportions when trying to shape one from clay and then guiding the children in creating their own. The educators in the other three preschools also experienced new ways of understanding natural processes when demonstrating a baby chick, caterpillar or seagull emerging from an egg, when recreating this process with warm, soft beeswax.

While the educators did say that they were pleased that the stories I had originally told were set in their local environments and made general references to the fact that they were learning more about their environments, it was their engagement in the research process and their creative expressions throughout it that displayed their enhanced understanding of their local environment and almost a sense of wonder at the scope of the topic and its potential application to the early childhood program.

Stage 3

In the final stage of the project the educators were using their new knowledge to tell stories and to plan and implement follow-on creative arts experiences that incorporated factual information about the natural world. One of the educators, for example, created a verse about silk worms and put it to a simple tune (on the day of the story), one was a collaborator in a spontaneous verse about a pig (see Appendix 3.24), and another about eels (see Appendix 3.13), also created spontaneously. This type of 'off the cuff' creativity relies not only on a willingness to attempt such a task but also on a knowledge of the characteristics of the subject.

During this stage, the educators regularly used the information they had obtained through research, and through artistic exploration of their subjects, in creative ways. For example, they had the animals in stories talking to each other as if they were capable of animated conversation. The topics of conversation reflected an approach to the subject matter that maintained the integrity of the animals and the feeding or lifecycle activities in which they engaged, reflecting a sound understanding of the factual information.

The increasing level of detail in the stories and creative experiences offered, reflected intensive research and creative exploration of the subject on the part of the educators, which in turn demonstrated a sound understanding of the subject matter. This is confirmed by the survey responses. In addition to Round 1 responses, the educators reported in Round 2 of survey question 6 that these understandings were developed through researching life cycles, singing, drawing, modelling, using natural materials and retaining the knowledge that they are an intrinsic part of the natural world. It

appears that the creative exploration of the natural world has added a dimension to the educators' understandings of it. The ways in which the educators applied these understandings throughout the research support this theory. Identifying themselves as part of the natural world, and the understandings inherent in this declaration of belonging, may also go some way toward ameliorating the effect of the fearful media messages and developing a deeper connection with their local natural environment.

In what way does working through the arts to develop experiences about the natural world or the environment for the children, affect the educators' sense of connection with their local environment?

Stage 1

The first three visits to each of the preschools involved sessions I presented and developed in collaboration with the educators. The stories were all set locally with the flora and fauna reflective of the immediate area. The educators provided feedback to say that they liked the idea of the stories being set locally as it reflected the areas where the children and their families lived.

The sense of awareness or connection the educators had with their local environment was, at the beginning of the research project, reflected through their awareness of the local facilities such as parks, swimming pools and local beaches. This was also reflected by the family respondents who cited these areas as the locations for their main involvement in the natural environment. This is also reflected in the educators' responses to question 11 (see Appendix 1.3) that asks about the relevance of the community to the child's understanding of the natural world (see Appendix 4). Stewardship, modelling sustainability and maintaining local parks or beaches, were the main themes of these responses. They also included teaching children about animals and extinction. These responses reflect the way in which the educators see the role of the community in teaching children about the natural world but also situate themselves in that community as educators.

The extent to which the educators' awareness of the natural world was incorporated into the preschool program was indicated initially through the natural materials they provided or promoted, the sustainability practices implemented as part of the program, and the educators' participation in the research process. Being part of this research project, even at this early stage, broadened the scope of their environmental foci by incorporating information about the natural world through the arts as an everyday component of the program. Their initial participation involved observation and collaboration regarding the story content and the follow up experiences. However,

they were also able to engage immediately with the topics at hand by responding to the children's questions and by elaborating on the content of the research visit sessions during and in between visits (see Chapter 6).

The aspects of the local environment that they focused on, as the research project progressed and they took a greater role in facilitating it, became more detailed and specific to the flora and fauna of their local areas.

Stage 2

By Stage 2, when three of the four teacher educators began to tell stories (there was also a support educator who began the storytelling process in Preschool 2), they seem to have chosen settings and topics for their stories that, for them, were representative of their local natural world. For Preschools 1, 2 and 4 this involved nearby regional or national parks and for Preschool 3, the beach. Preschool 3 was set in an inner-city suburb, in contrast to the other three preschools which were located in city fringe environments. The beach seemed to be the designated environment for Preschool 3 and the children regularly brought in items found on the beach. The educators at this preschool set all of their stories at the beach, partly in response to the children's interests but also as part of their own focus. This may have been due to the lack of notable green space in the vicinity, or the proximity to the harbour foreshore where there are council maintained recreation areas. The distance to these areas was only about three kilometres and the distance to the beach was about twelve kilometres but to the east across the city. When I asked the teacher educator about the focus on the beach, she said that the educators and the children liked it and it seemed to belong as a topic in their preschool. The stories developed in each of the preschools, the follow up experiences they planned and the natural materials provided for the children or for the story setting, all except for Wilma the Wombat, reflected their chosen areas. This consistency in depicting a particular area and nominating it as their 'local environment', provided scope for in-depth investigation of the flora and fauna and the habitats.

The detail the educators gathered about the animals, plants and habitats in focus, significantly expanded their knowledge of their local flora and fauna and appeared to contribute to a growing sense of place. This was evident in the conversations they had with me or with the children when they placed emphasis on the plants, habitats or animals being in 'our area'. The educators developed storytelling skills in varying degrees but all became competent in creating a narrative that reflected their story settings, characters and habitats respectfully and as friendly, colourful, animated and safe. They did so through trial and error, and where needed I collaborated with them in making the stories more child-friendly. This included assisting in development of the

plot where required, simplifying strings of factual information into action narrative, and making suggestions about where to build on the story characters or their adventures.

The educators were all proficient in planning and implementing visual arts experiences and evidence of this was on the walls or on horizontal display spaces in all of the settings. While I had modelled some additional techniques, such as watercolour painting or genesis drawing and sculpture, the educators had a broad range of media with which they were proficient, and many years of experience in using them. Turning these skills and media to expressing subjects in the natural world posed little challenge. They, and the children, had created displays of the topics in focus that showed clearly that frequent and innovative explorations of the natural world occurred and that they had explored their local environments in detail as part of this process. In the area of drama, there was some exploration on the part of two of the educators and in music, one educator created a four line song to a borrowed tune. All of these activities represent a further engagement in the local natural environment through the domains of cognition, affective capacities and kinesthetics. The designation of specific areas as local environments and the repeated, respectful and creative representation of them, indicate a growing sense of place and connection with them.

Stage 3

The connection the educators had developed with their local natural environment was evident in the four preschools through all of the creative experiences they implemented including drama, three dimensional sculpture, visual arts experiences and the displays created using the artefacts the children and educators had made (see Chapters 5, 6 and 7). The only area where the educators did not implement self-generated creative experiences was through music (except for one example in Stage 2 above). They did have an appreciation for music and the role it could play in connecting to and expressing elements of the natural world but, as mentioned previously, did not have the resources or time to develop the skills to use it.

The educators' stories reflected a deepening connection with their local natural environments with every telling, every story scene and every linked creative experience they planned and implemented. The stories contained more description of the habitat, the challenges in it or comforts it afforded the story characters, and the social dynamics of the characters. One of the clearest examples of this was the story that involved Mother Kookaburra and Mother Cockatoo discussing the demands of their babies, the food they ate and the efforts they had to go to find food for them. Language and concepts that reflected the natural environment, used by the educators, had become detailed and specific and reflected their immersion in the natural world. It was common

to hear specific names of plants, birds and insects, or of concepts such as camouflage and photosynthesis. Through this use of language, they also supported the children's environmental vocabulary and this is reflected in the educators' responses to question 9 about what language the children use to reflect the natural world (see Appendix 4 for responses).

The educators' responses to question 11 (see Appendix 1.3) regarding the role the community plays in supporting a child's understanding of the natural world, are also of note here as they reflect the educators' sense of belonging to the community and the local natural environment, and their beliefs about the need for a strong connection with it. They included the need to make immediate bush environments familiar, to build connections between local community and preschool, and to foster a sense of wonder and a love and appreciation for the natural world and its beauty. Developing a connection with the environment through appreciation of its beauty is becoming a recognised element of education about and for the natural world (Lubarsky 2010; Wilson 2010). Wilson says the sense of wonder we develop as part of our aesthetic appreciation is retained and becomes part of our understandings of natural patterns, forms and colours, helping to develop a different way of knowing or connection with environments and their inhabitants. In addition to the responses discussed above, helping children to know that the natural world is a significant intrinsically woven element of their home was also seen as the role of the community of which the educators are part.

While there were responses in Round 1 to a number of the survey questions that asked about the connection with the natural world, the constant references to stewardship for a better future indicated an association to the natural world that was underpinned by responsibility to protect it, and to preserve it for others. The responses for Round 2 (see Appendix 4 for full comparative responses) reflect a need for a connection with the natural world here and now for the individual, that goes beyond the responsibility for preserving it for future generations. The need for environmental stewardship is mentioned but notions of connection with the natural world are strengthened by ideas of love and appreciation, and of being part of the environment. This is what becomes the motivator for constructive action. The educators also credit a connection to the natural world with assisting them to become imaginative and creative themselves, to avoid disconnection from the natural world through apathy, and to develop a sense of place in their local environment. One educator said that this connection and understanding would help in developing a broader understanding of life and a sense of confidence and wellbeing in daily life. These responses speak of a much deeper connection. One that is intrinsic in human makeup and is part of every aspect of development including self-confidence, a sense of belonging, imagination and creativity:

essential elements of human success (Shepard 1995; Roszak 2001; Louv 2006; DEEWR 2009). In this scenario, connection with and affective/emotional attachment to the natural world enhances the capacity to act in a constructive, coexistive and sustainable manner, and is consistent with the tenets of one of the key theoretical underpinnings of this research: ecopsychology.

Conclusion

The educators participating in this research engaged in a collaborative year-long process where they focussed on incorporating content about the natural world into their early childhood programs by using arts based teaching pedagogies. In doing so, they dramatically increased the conent about the natural world in their programs to the extent that it became a normal part of the every day experiences in their preschools. They developed comprehensive understandings of their local environment which affected their beliefs and feelings about their connection with the natural world. They expressed strong beliefs about their role as environmental educators and the importance of teaching children about the environment through positive and engaging experiences. They also developed additional skills in a variety of arts media through which they represented the natural world in a spontaneous, life filled manner on a daily basis in their programs with the children. The following table outlines the progression of outcomes for the educators.

Table 8.2: Changes observed by stage during educators' participation in the study

Stages	Incorporation of information about the natural world into the program - evident through:	Understandings of or attitudes toward the natural world - evident through:	Sense of connection with the local environment - evident through:
Stage 1	• Gardening, composting, recycling, discussing sustainability. • Encouraging observation of plants. • Providing inviting outdoor spaces for play. • Using correct terminology • Discussing insects flora and fauna. • Encouraging children to participate in creative arts sessions reflecting the local natural environment. • Conducting drama and collage experiences with the children in between researcher visits	• Expressing views that it is important to spend time in the natural world. • Statements that it is important to look after the natural world for future generations. • Responses that said fear-based messages are agents of understanding the natural world. • Passion for teaching children about sustainability. • Engaging in simple hand and arm movement to reflect animals.	• Educators saying they like stories set locally as it reflects their home. • Provision of small caches of natural materials from the local environment. • Responding to the children's questions about the environment with factual clarity and enthusiasm. • Collaborating with researcher on story content to reflect their local environment.

Stages	Incorporation of information about the natural world into the program - evident through:	Understandings of or attitudes toward the natural world - evident through:	Sense of connection with the local environment - evident through:
Stage 2	• Researching factual information about flora and fauna for stories and creatively transforming it into story content. • Connecting story content to children's interests in natural flora and fauna. • Serialisation of stories. • Planning, collaborating on and implementing stories. • Suggesting, planning or implementing after-story creative experiences. • Intensive engagement in creative activities based on the natural world in between visits.	• Reflecting understandings that self-generated stories and experiences can be meaningful. • Including anthropomorphic attributions to animals in discussion. • Developing awareness of how to present facts through the arts. • Exploration of animal qualities through artistic expression. • Dramatic increase in educator knowledge of plants, animals/insects and habitats.	• Choosing story content themes that are emblematic of their own local environment. • Becoming skilled in developing narratives about 'their area'. • Including in stories current local insect, animal and weather activity. • Facilitating displays of insects/animals and habitats evident in preschool rooms.
Stage 3	• Deliberate use of stories to convey concepts about the natural world and intentional teaching using creative arts • Daily incorporation of content about the natural world through creative arts, stories, conversations and investigation. • Excursions to natural spaces. • Provision of a wide range of natural materials.	• 'Off the cuff' creation of song and verses. • Story animals talking to each other , discussing challenges or life cycles. • Ongoing linked stories and creative experiences reflecting local flora and fauna. • Expressing views that the arts are an integral means to incorporate information about the natural world into the preschool program.	• Displaying artifacts that depict ongoing regular engagement in stories and creative arts experiences based on the local natural environment. • Expressing considerable detail in stories reflecting local area. • Elaborating on the emotive elements during experiences such as the beauty, wonder or majesty of a scene/action or movement.

Chapter 9
Analysis: A Spectrum of Colours: Children

This chapter analyses the results and findings against the research questions related to the children. It also highlights emerging themes and shows how they are related to the research questions.

The following table shows the connections between Research Question 2, the sub-questions that arise from it, the data categories and the relevant educator survey questions. As the findings were originally grouped under data categories (see Chapters 6 and 7), and this chapter is an analysis of the findings against the research question and sub questions, the relationship between the data categories and the research sub questions is included in the table below.

Table 9.1: Links between Research Question 2, sub-questions, data categories and survey questions

Research Question 2	Sub questions	Data related to children	Educator survey questions considered
• What are the benefits for children of experienc-ing creatively presented material about the natural world as regular content in the early childhood program?	Are there changes in the ways in which the children express their understandings about the environment after a period of using creative arts experiences to support learning about the environment?	• Reflecting concepts/ expressing understanding of the natural world through play and interactions • Expressing complex understandings of the natural world • Using natural materials creatively	1. What, if any, are the benefits for children when they have a good understanding of the natural world? 2. What do children know if they have a good understanding of the natural world? 3. How do they develop their understandings of the natural world? 9. What language/ words/concepts do the children use when they talk about the natural world? 10. When do they do this?
	Are there changes to the way in which the children behave toward the natural world or environment?	• Acting in a manner that shows care of/regard for the natural world • Expressing con-cepts of care/com-passion/nurture introduced through program content	13. In what way, if any, is an understanding of the natural world important for children to develop as environmentally responsible citizens?
	Are there any differences in the interactions between the children that can be attributed to the regular experiences of creatively presented information about the natural environment?	• Interacting in ways that show new or changed social/ group dynamics. • Using analogies of interactions in the natural world to characterise social dynamics	11. How is the local community and environment related to a child's understanding of the natural world?

Research Question 2 relates to the children and asks what the benefits are for them of experiencing creatively presented material about the natural world as regular content in the early childhood program. To explore the idea of 'benefits' I have developed three sub questions that relate to the children's understandings of the natural world, their behaviour toward it and the way in which their interactions are affected by it. These sub-questions appear below as headings and the relative data is analysed under each of them in three stages. Stage 1 is the first three to four months of the research, Stage 2 is the middle three to four months and Stage 3 is the final period of the research. Where relevant, I have also included the educators' responses to the survey questions. As in Chapter 8, Round 1 responses appear in Stage 1 of the relevant sub-question and Round 2 responses appear in Stage 3 of the sub-question to which they are relevant.

The analysis appearing under each of the sub-questions, and in each of the stages, draws upon the findings related to all aspects of the children's engagement in the educational program as it represented and reflected the natural environment. This includes their responses to the stories they were told, the songs they were presented with, the play they engaged in, and their participation in all of the creative follow on experiences that were part of the program. It also includes the language they used in their everyday interactions. All of these elements were part of a rich discourse involving language, interactions, actions and behaviours (Gee 1996) indicating engagement in the natural world, and provide insights into the questions being asked.

Are there changes in the ways in which the children express their understandings about the environment since they have been using creative arts experiences to support learning about the environment?

Stage 1

In the initial stages of the research the children were curious about all aspects of the study. The whole experience was new from the format of the seating, to the told story containing details about animals or insects, to the creative experiences that followed. On the first couple of visits, a curious 'what are we doing' was common on setting up the chairs or preparing art or craft materials. This was because they were not used to the chairs being set up for group time in this way (in a circle formation) or familiar with many of the materials I brought in.

The children were curious about the details of the story characters and their environments, often asking questions or adding their own snippets of information, for example sharing details about how sharp the branches were or what the kookaburras ate in a given area (see Movie Clip 7.2 in Chapter 7). The language that I observed the children using showed that it was often noun based and reflected simple concepts and representations where generic terms such as bug, butterfly, bird and lizard were common. My observations were consistent with the educators' survey responses to Question 9

(see Table 9.1) that also reported that the children's language was noun based, e.g. bug, insect (sometimes with the correct names), sky, tree, but also contained some adjectives, including big, scary, or yucky and some verbs such as compost and recycle (see Appendix 4.1 for a table of responses).

One educator said that the level and frequency of language related to the natural world depended upon how long the children had been part of the program. This indicates a belief that the preschool plays a significant role in supporting children's understandings, therefore highlighting the role of the educators in language development related to the environment. It was common to hear interactions between educators and children that focused on gardening, water conservation and recycling, for example at lunchtimes when the children were working out which bin to put their rubbish into, or when turning the taps off 'because we have to conserve water'. The children's early expressions of the natural world at this stage were consistent with what the educators, in their responses to survey Question 2, believed the children would know if they have a good understanding of the natural world. This included information about where food is grown, facts about plants and animals and about being sustainable stewards of the earth for future generations.

During the first three sessions in each of the preschools the children were becoming familiar with a range of materials that were intended for use in representing the natural world. They included seedpods, bark, leaves, stones, shells, driftwood and dried seaweed. They also included large pieces of coloured cloth that could be used for creating displays or scenes. In all groups the children enthusiastically created playscenes using materials listed above. These play times were noisy, unstructured and enthusiastically embraced by all of the children in the group for varying lengths of time (see Chapter 7 for further detail). Having quickly developed an understanding of the scope of the materials, there were small groups of children in each of the preschools who created their own smaller scenes as backdrops for play both inside and out. The inclusion of animals or plants in the play was minimal at this stage but the scenes created did reflect a 'setting of the scene' into which the details could be added. By the third visit, the children had become familiar with a wider variety of materials, including creative arts materials for expressing the natural world. They started to create animals/eggs/insects or plants and to make scenes in which to place them. This was demonstrated by making the cockatoos' eggs (see Picture 5:10) and then drawing a nest in which to place them (see Picture 6:34), or finding an egg carton that could be modified to hold many birds' eggs (Movie Clip 7:3).

The children were also learning the new processes with drawing and sculpture that I demonstrated where the progression of the artefact followed the growth sequences in nature. When I demonstrated genesis drawing with the children, they prompted me to include additional features such as more sunrays or extra red flowers revealling their developing familiarity with drawn representations of the natural world and the components that could be included. Their own drawings included elements that they felt were important, but many also showed that they understood the process that had been

modelled and drew images with many of the same features as the demonstration drawing (see pictures in Chapter 7). This reflected a desire to include and perhaps master the concepts and forms inherent in creating them. Creating the earth, sky and sun provided a setting in which all of the other elements belonged and was the drawn equivalent of the playscenes the children had created – it set the scene for the other elements. Placing the seed in the earth and giving it roots, then giving the seed leaves, a stem, main leaves and then flowers, is a progression that reflects natural process from which the children can draw additional understandings about the growth of plants. However, the children also showed their ability to transfer their new knowledge by personalising their drawings with their own features such as butterflies, reeds, lizards or extra flowers. These elements were also created using the genesis process.

The children also demonstrated an enthusiasm for reflecting the natural world through movement, song and drama. They followed their educators and produced actions to songs without prompting. It seemed that adding actions to songs was a regular practice and one that the children expected to engage in. Even though all of the songs were based on animals, plants or phenomena from the natural world, and the educators did not have actions to represent them in their repertoires, they found movements they could use and the children followed (see Movie Clips 6:7, 7:1, 7:6, and 7:11). The children were also enthusiastic about the new songs that I brought in, happily clapping or stamping their feet along to the music. The idea that they would learn the words to the songs seemed to be new to the children so I focused on the choruses as they contained alliteration and rhymes that were more accessible. By the end of Stage 1 the children began to recognise the local content and the story characters in the songs and to 'own' them. This was evident as they began to ask for their favourite songs and for 'their preschool' songs.

Stage 2

During Stage 2 the children were becoming more prolific in their expressions of the natural world. They remembered elements from stories, asked about the characters and showed an interest in their fate, particularly at the end of a story where there were challenges to overcome. In my experience, this reflects an interest in, or identification with, the characters that can be followed by the educator to create further stories. Identifying why a particular child has an interest in a given story character can lead a sensitive educator to creating additional stories that contain elements for individual children to assist them in their understandings of a given topic. The educators began to take note of the children's interests in the story characters and to build on them whether through story or through other creative experiences.

The children's expanding awareness of the natural world during Stage 2 was evident in the level of detail in the drawings, paintings, three dimensional sculptures and play that they created and engaged in, and the skill and care with which these were created (see Chapter 7). That children can display their understandings about a given topic through the creative arts is a well established phenomenon (Kolbe 2001; Arapaki & Zafrana

2004), and the detail in these drawings was consistent with this idea as they included the habitat, friends and food that the main subject might require. The complexity of children's play also often included family groups of animals or birds and their behaviour, lifecycles or habitats, which was reflective of the characteristics these creatures displayed in the natural world. Children who were not part of the group attending on the days I visited (in two of the preschools), or children who were in different rooms (in one of the preschools), began to ask about the artefacts they were seeing created by their peers, who were part of the research process. After detailed explanations from or investigations with the educators, or explanations from the other children, they began to create their own artefacts. The duck habitats in Preschool 2 (see Picture 7:12) are a good example of this as are the murals, collages, drawings and paper maché figures in Preschool 1 (see Pictures 6.22, 6.23 & 7:24). In the case of the duck nests in Preschool 2, this investigation was primarily in the form of questioning peers and educators. In Preschool 1, the children in the Kookaburras' Room engaged in considerable research with their educators and produced many creative artefacts (see Chapter 7). This gives further credibility to the notion that the arts can be a vehicle through which the natural environment can be understood. It appears that the arts can also prompt investigations into the natural world that enhance children's understandings.

The variety and complexity of expressions used by the children showed that they now had an extended awareness of the natural world and a connected mind-map of characters, habitats and behaviours with which to explore it. This was exemplified by the duck habitats created in Preschool 2 and the beeswax window in Preschool 1, which contained a whole habitat (see Pictures 6:9 – 6:13, 7:10 and 7:20).

Scientific concepts were an integral part of all the told stories, with the factual basis of the flora or fauna always the beginning point for creating them. This approach was highlighted when the subject of investigation became rainbows after hearing stories that included them. The *Rainbow Song* (see Appendix 3:12) follows the order of the colours and supported the children's memory of them as they sang it often, but it was also the exploration of the three primary colours, and the secondary colours that result from mixing them in paint and in crayon, that consolidated their understandings. Some of the children's drawings and paintings show the seven rainbow colours in order. Others are created using the three primary colours, revealling the secondary colours where they overlap (see Picture 6:14). Many of the children's drawings and paintings show a clear understanding of the order of the colours in a rainbow and how they come about. This is remarkable for children of this age group given the findings of researchers from the Cognition, Language and Learning Laboratory at Stanford University who conducted a study showing that young children between two and six years of age cannot name colours (Dye 2010) due to the ubiquity of colour in the environment and the words with which they are associated post nominally. The fact the children in these four preschools had such a detailed and precise understanding of the rainbow colours is a good example of the knowledge and understanding that can come through the combination of theory, practical experiences and creative representations of a concept.

The children also started to declare themselves as having better understandings of animals, such as the little boy who told me he now knew about starfish and that they needed to be made in a shape (in beeswax) that would drape over the rock because a starfish would not be stiff underwater (see Picture 7:16). They declared themselves as being better painters, drawers and sculptors and they became more expressive in the various creative media reflecting a growing understanding of them (see Movie Clips 7:9, 7:11 and Pictures 7:13 to 7:17). They became more confident in hypothesising about what animals would eat or what sort of burrows, holes or nests they might live in. They also began to ask for particular types of stories or for the story characters to have specific sorts of experiences; reflecting their engagement with the characters and the knowledge of what kinds of experiences they might have. For example, one child asked for a story where the wombat got stuck getting into its burrow.

Stage 3

By Stage 3 the children were so familiar with the idea that we were representing their local environments through the arts, they were predicting what the stories would be about either due to the previous stories having openings for follow on, as in the serialised stories in Preschool 2, or due to the prevalence of a particular bird, animal or insect in their preschool playgrounds or the local area. This was exemplified by a child in Preschool 4 who saw me holding three cicada shells that the children had collected. As we sat down for a story he said, 'once upon a time there were three cicadas'. I did not use the same opening for my stories but it was clear that he meant this comment to represent his prediction that I would use the cicadas as a story topic.

The children were now also more confident in their whole body movement when we dramatised the stories. Their movement of animals was more nuanced, sensitive and creative, and lacked self-consciousness (see Movie Clip 7:11). They were also more sensitive and expressive in their movement of elements such as the wind as a gentle breeze or a storm; demonstrating a knowledge of the varying speeds and dynamics the wind might take in these different forms. The movement of the eels was also a good example of this (see Movie Clip 7:13). The children involved had done some research about eels, had heard a number of stories that included them and seen them in the local creeks. Their movement was very representative of eels.

Expressions in other media also indicated an expanded understanding, on the part of the children, and a level of familiarity with the habitat in which their play, conversations or the creation or artefacts was set. The beeswax window in Preschool 1, which was a group project, was created amidst conversation about the range of animals and insects that appeared in it, and their needs for sun, water or food and their friends (see Picture 7:20). The educators also commented on enhanced levels of understanding for the children in Round 2 of their responses to Question 2 of the survey (see Appendix 4 for comparative responses). The educators reported that children who have a good understanding of the natural world have a sound understanding of their local environment, animals, insects

and plants, and have empathy for them. They have a respect for all living things including respect for others, and they do not fear the natural world but know how to nurture and preserve it. They know that they are part of the environment and that the natural world and their existence are linked together. These responses reflect a connection between understanding the natural world, feeling a part of it, and knowing how to live in harmony with it.

The children's language was also more specific and detailed than earlier in the project. For example they knew the names of many birds, insects, reptiles and marsupials. This more detailed expression of the natural world through language was also commented on in the educators' responses in Round 2 of the educator surveys, specifically Question 9 (see Appendix 4). They noted that children now talked about complex concepts such as camouflage, photosynthesis, pollination and germination and used specific names for animals, insects and birds. Overall by the end of the research project the children demonstrated a significantly increased understanding of their own local environment, and the flora and fauna within it. They had also developed new skills for recreating elements of the natural world through all aspects of the arts that enabled them to represent their understandings through a range of media.

Are there changes to the way in which the children behave toward the natural world or environment?

Stage 1

When we consider the idea of behaviour toward the natural world with young children, we usually consider, or should advocate, constructive action of some kind (Davis & Elliott 2003; White 2004; Davis & Pratt 2005; White & Stoecklin 2008; Gambino, Davis et al. 2009). With this in mind, I have focused on the children's expression of care, compassion or nurture, as per the data categories in Table 9.1.

At the time that the research visits began the children were co-creators of a vegetable garden, were regularly recycling food scraps and lunch wrappings and had been involved in worm farming or composting. One of the preschools had a rabbit and a guinea pig that the children were involved in caring for. As the visits ensued and the children's exposure to other elements of the natural world progressed through stories and creative experiences, the children began to include notions of caring for other species of animal/ insect or habitat.

One of the predominant ways in which the children displayed notions of care, compassion or nurture, was through their play. There were many examples of the children taking care not to harm or disadvantage the animals or habitats in the playscenes they created to represent them. They were careful not to step on the imaginary yabbies, made sure the frogs had lilypads to sit on and made sure they did not step on the ducks' nests. There were also three occasions, when playing alone, that individual children lay down in the

scenes they had created; one holding soft toys and curling up for periods of up to ten minutes. This suggests a level of comfort being afforded by the playscene habitat that is perhaps associated with feelings of safety, warmth and relaxation, and perhaps of nature caring for them.

The children also showed concern for the wellbeing of the natural world or elements of it during creative activities such as sculpture, drawing and painting. Ensuring the eyes were included on the butterfly so it could see or making it a flower so it was not lost in all the autumn leaves, are acts of kindness. Creating clay nests that fold over or woven nests that are a close weave to keep out the breeze are also acts that show compassion that may have been prompted by the stories but were not specifically mentioned in them. Even when drawing fauna, the children began to articulate the need for including elements that would ensure the safety, wellbeing or companionship of the subjects within it (see Movie Clip 7:17).

Care, compassion and nurture for the natural world may be seen as a forerunner to, or an element of, being an environmentally responsible citizen. In the educators' responses to Question 13 of the educator survey (see Appendix 4), which asks what understandings of the natural world are needed in order to be an environmentally responsible citizen, they comment that appreciating animals and nature is important. They also cite understanding our responsibility for the environment as important. By the end of Stage 1, the children had begun to show, if not responsibility, then enhanced care and appreciation for the animals, plants and habitats through their play and creative activities.

Stage 2

In Stage 2 the children began to identify more with the individual characters from the stories rather than generic species, and their protective or caring behaviours were related to the individuals. Picture 7:40, created by a child at Preschool 1, shows many lilypads so that Croaka Loka the frog would not have his feet nipped by the yabbies. Charlie the case moth was given a new home by the children at Preschool 2 in a box lined with leaves and covered with a tulle scarf. The children and I also collaborated to develop a verse about him, which I wrote down (see Appendix 3.23). The children were naming and identifying with the different characters in the stories and giving names to animals or insects they discovered in the playground. In Preschool 4, the ringleader of the cockatoos that raided the garden was named Burger by the children and the birds were treated compassionately when the children decided to make and erect bird scarers to stop them destroying their garden. The act of naming the story characters gave them individual identities and the children responded by asking for these characters to appear in stories. They took ownership of them and they became their stories and their characters. Naming the characters was also an important element as it reflected a deeper knowing of them and greater connection to them.

The children also seemed to attribute different levels of importance to, or connection with, the characters depending on who told the stories. When the educators told the

stories, the children role-played specific, named characters frequently, and soon after the story. They did not do this to the same extent after the stories I told even though they contained similar content. The expressions of care and nurture were much more obvious when the children were playing characters that their educators had developed or told stories about. For example, in the play involving the kookaburra family, the mother kookaburras went to great pains to reassure their babies, who were feeling anxious, that when it came time to learn to fly, they would support them and all would be well. Perhaps the children were identifying more strongly with their educators stories and characters as they had a daily history of shared experience with the educators and additional opportunity to share information about these creative artefacts. The children's attachment to their educators appears to have transferred additional significance to the characters and made them more worthy of their care and nurture. This reflects the idea that we understand what we experience and we love what we understand. Through their own stories and their own characters, the children knew their environments and became attached to them and protective of them. If this connection between the children and their educators does have a significant bearing on the children's love for the environment, then this could be a powerful tool for environmental education, consistent with Randy White's claim that we have to teach the children to love the earth before we can ask them to save it (White 2004; White & Stoecklin 2008).

These expressions of care, nurture and identifying with the characters were particularly evident in Preschool 2, which had the ducklings. There are numerous observations of the children taken by the educators that demonstrate the children's understandings of the need for care, warmth, parental love and guidance. The children named all of the ducks and had particular attachments to them. The stories in this preschool, even after the ducks had gone, continued to feature them as the main characters and the children clamoured to play these characters, or those that protected them from danger, in the dramatisation of the stories.

The children showed increasing levels of care and compassion toward the natural world through other creative modes also. In drawings, characters were drawn with food, with armour, or in nests that would shelter them from any harm (see Pictures 7:45 to 7:49). Clay nests were built for the wombats so they could go in head first (it's faster) and one wombat was even given fur to ensure she did not get cold. In the children's role-plays they played families who were camping in the national parks who ensured they treated the animals (who happened to be the characters in the stories) with care by keeping their distance and ensuring they were not given any inappropriate human food. The levels of understanding and compassion displayed during these games is consistent with David Curtis's findings that being involved in creative activities that deal with elements of the natural world is more meaningful for the children than just hearing about animals or habitats or watching others perform plays about them (Curtis 2007).

Stage 3

In Stage 3 the level of detail in the educators' stories had developed, the cast of characters had expanded and with them the language that the children used to express their understandings of the natural world. The children's dramatic expressions of the natural world had also become more multifaceted.

For example, in Preschool 1, the natural world was so strong an element in the daily program that it appeared as if there was immersion in it. The variety of insects and animals that the children knew about was very broad and was reflected in the three metre long and one metre high mural created over a three month period with the children (see Picture 7.53). There were habitats for all of the lady beetles, frogs, butterflies and lizards. The tree hanging from the ceiling (a green mosquito net fanned out above adult head height) contained numerous birds, spiders and insects that the children had made. The stories that the children enacted during free play continued to include complex families of kookaburras whose babies were given warmth, food and instruction on how to fly. The kookaburra families also interacted with cockatoo families and the children were comparing and contrasting the diet and behaviours, similar to the way in which the teacher educator had done in the story. They used complex language in these discussions explaining the differences between a seed-based diet and an insect-based diet, and what was involved in finding the right food for each of the characters. The duck stories in Preschool 2 had also become more complex, involving a large cast of characters with complex interactions between them.

Similar scenes were played out in the other preschools, particularly Preschool 3, where the children created or built on storyscenes created by the educators. There was a high level of detail in these scenes so that all of the animals, sea creatures or birds had the habitats they required. This was an ever expanding and integrated world of creatures, habitats, babies, lifecycles and elements (wind, water or fire). The topic of the natural world had become part of what the children thought about on a regular basis even when not involved in programmed activities. This was evident in their play and in the drawings and other creative artefacts they developed. In Preschool 4, over a three day period, the subjects of 17 of 27 drawings were about plants or animals and contained additional elements to ensure the main subject of the drawing had food, shelter or a friend.

It may be that the behaviour the children expressed toward the natural world became more focused on care and nurture due to the volume of content in the program that reflected it. However, the programs in all preschools were responsive to the children's interests and so the subject matter became self-perpetuating. The children's play may have simply been their way of investigating and making sense of their world, as is often the case (Axline 1969; Cunningham 1994; Dockett & Fleer 1999; Hamilton & McFarlane 2005; Fleer et al. 2006), but in these instances they were making sense of the natural world around them. While the mechanisms the children used to explore the content are familiar across all childcare settings, the ever expanding level of knowledge, complexity of the playscenes and schema and the affective behaviour demonstrated within them,

reflect a growing connection and interaction with the natural world that denotes a sense of belonging to a community with a shared environmental backdrop of which the children are an integral part.

Are there any differences in the interactions between the children that can be attributed to the regular experiences of creatively presented information about the natural environment?

Stage 1

One of the first impressions on day one at each of the preschool sites was the large group of children playing, or at least being together, in the introduced story scenes with the natural materials. As this was a new concept in play spaces for the children, containing a greater volume of natural materials than they were accustomed to having for play, they were all curious and spent some time in it and with them. After twenty minutes or so, these groups became smaller and more reflective of the natural play affinities that the children had developed by that time in the year (two to four weeks into the year depending on the site). There were instances of groupings based on interest in particular materials, including a small group of children who spent some time listening for the sea in the shells or those building rivers running through Farmer Fiona's fields.

The circle of chairs in which we were seated for the songs and stories also provided the children with an experience of the whole group and an opportunity to determine who had interests similar to theirs. In this format there was scope for impromptu movement of animals or demonstrations of dynamic movement (see Picture 7.63) and for animated group discussion where the children were facing each other, and addressing each other. Like groupings also occurred during creative activities such as drawing or group drama sessions (see Movie Clips 7:20 and 7:21) where the children discussed what they were drawing or engaged in coordinated group movement. The example shown in Movie Clip 7:21 is extraordinary as it occurred on the first session with that group of children. The movement was so coordinated and sensitive and the result was fluid spiral forms moving in and out that represented the spinning of a cocoon and the emerging of a butterfly. The children were amazed and there was a feeling in the room that we had just created something wonderful together. That these children were three and four years old highlights the sensitivity children can display toward the natural world through imagery and sympathetic movement.

There were also instances of small groupings such as that recorded by the teacher educator (page 158) where she specifically mentions that these children would not normally seek each other for interaction. There were a number of instances like this where the children found themselves in groupings related to their interest in the natural world or the modes through which we were expressing it.

Stage 2

We know as adults, the natural world can evoke emotions such as a sense of awe and wonder at a high mountain view or panoramic sunset over the beach. The children also seemed to have experiences where the natural world or imitations of it evoked emotions or behaviour that was not a regular part of their everyday interactions. There were a couple of instances in Stage 2 (in addition to those in Stage 1) where two different children created a river with a large long blue cloth and then lay down in it. I noted that on these occasions the story had involved cosy warm nests near water. On each occasion, the children stayed in their nests for approximately 10 minutes. Another iteration of this sensitive, or affective behaviour was the child with the potato heads who after stroking the soft grass on them very gently for a period of time, began to talk about his new baby sister (Move Clip 7:22). Even though the natural world was creatively invoked and not a real outdoor experience, this is consistent with the findings from a number of researchers who contend that children are calmer and more reflective when they spend time in the natural world (Feral 1999; Louv 2006; Gill 2007).

As the children created three dimensional artefacts using beeswax, clay, playdough or sticks (for the stick insects) they developed short-term surrogate friendships through them. Attributing feelings or qualities to their butterflies, beetles, insects, starfish, wombats or seagulls, they sought those who were like-minded or similarly endowed with special abilities. The gender balance seemed quite even at these times in spite of the rebuff suffered by Olivia when she tried to enter the play with two of the boys (see Picture 7:70). There were many instances where common interests were pursued by as many boys as girls, and this was particularly evident in the exploration into rainbows in Preschool 1 (see Pictures 7:66 to 7:68). Movement was an area in which the boys were happy to be seen as experts in Preschool 3 where they proudly expressed their interpretations of the different animals (see Movie Clips 7:13, 7:18 and Pictures 5:32, 6.38). This was a creative follow up to the stories their educators had been telling where the same boys had made the teacher educator promise she would not tell any chapters of the story when they were not present.

The story creatures provided the children with a variety of characters with a range of qualities that they could role-play. Some of the characters were kind or helpful, others were courageous or persistent, and others still were vulnerable or in need of assistance. These qualities and many others were described in the stories and attributed to the characters. The children moved on from role-playing the basic movement or actions an animal performs to including complex interactions between characters, with rationales behind their behaviour that had to be explained as part of the play. This meant that children who identified with particular attributes or qualities often found themselves becoming part of the play where this was required. It was common to hear phrases such as: ‘Don’t worry babies. I will go hunting for food as soon as the storm passes. Then you won’t be hungry anymore’. Another play group of wombats were discussing how strong they were going to have to be, and how they would take turns to dig out the tough tree roots.

The children appeared to be able to interact as whole group during free play in the one setting (in the rare instances where this occurred) in a relaxed and cooperative way, without the raucous excitement that ensued in Stage 1. Picture 7:72 shows twenty children playing together at the same large table as they manipulate their sea stars and urchins within the playscene. There is ongoing discussion about who is doing what and with whom. I contend that the process of having many characters to identify with in stories about the natural world, gives children models of behaviour and social interaction to consider and to use in examining their own interactions or circumstances. Furthermore this can have an effect on children's behaviour both individually and as a group. This is consistent with the findings of the pilot project that preceded this research where the educators could see definite changes in group dynamics and the children's interactions with each other (Tarr 2006).

Stage 3

One of the strongest examples of the children spending time together in varied groups sizes is in Preschool 1 where the large mini-beasts mural was created. This project involved a commitment to a common purpose for three months and all of the children participated in varying groups to investigate, dramatise, and create the creatures and habitats that were included in it (see Picture 7:53). Role-playing stories, in addition to the elements for the mural, in this preschool became more common in Stage 3, with the children recreating the stories that their teacher educator had told. They included much detail about friendships with other animals, types of food for the babies, and advice about looking after themselves in the big wide world.

That shelter, food and companionships were such common themes in the stories was not surprising as these are features in the lives of all living creatures. These elements featured in the stories and many of the challenges in the stories occurred when there was a threat to one of these elements. The sense of place and of belonging was also a strong theme in all of the stories and one that elicited statements of ownerships about the stories from the children. They were their stories, and their experiences and a key means of interacting with the natural world. Reflections of the stories and the characters in focus were seen in the real world by the children on the way home from preschool when a wallaby or kookaburra was spotted, on weekends when at the beach where the seagulls were fossicking in the picnic grounds, or on finding a crab among the rocks. The children often mentioned these episodes to their educators, and they did so with increasing frequency and detail as they added them to their tapestry of characters and understandings. The educators' survey responses to Question 11 (see Table 9:1) about the local environment, and how it is related to the child's understanding of the natural world, reflect the children's comments about it. They note that building connections between the preschool and local community and ensuring the children

have experiences of and in it, will help to foster a love of it, appreciation of its beauty and a knowledge that it is their home.

Having a sense of place and belonging to place and family is recognised as a primary need in the Early Years Learning Framework (DEEWR 2009). There are many commentators and researchers who advocate a sense of place as being essential to wellbeing (Prohansky & Fabian 1987; Suzuki 1997; Pyle 2002; Sobel 2005). Such an in depth focus on the natural world, as was experienced by these children through a wide variety of media, appeared to enhance their sense of place and their sense of belonging to each other as a group and to the community in which they lived. It assisted them in relating to each other through the many models available in the examples of flora and fauna behaviour in the natural world, and in relating to their own local environments due to the understanding of it they had developed. One of the teacher educators said that by the fourth term of the year, the children's play and interactions were purposeful, cooperative and full of intent, and she attributed this to the focus on the natural world.

Conclusion

The children in these four preschools participated in a process with me and with their educators that engaged them in learning about the natural world as a regular component of the early childhood program. The creative arts were an integral part of the manner in which the content about the natural world was presented, and the children participated in all elements of the program with enthusiasm and curiosity. Their understandings of the natural world became detailed and complex, incorporating metacognitive understandings of their local natural environment, its habitats and inhabitants. At the conclusion of the research, their behaviour toward the natural world displayed a complex interweaving of care, nurture and protectiveness, and included a sense of their own relationship with the environment. Interactions between the children also reflected the social dynamics of flora and fauna in the natural world as they drew upon them for example. The focus on specific topics and media through which they were explored also resulted in flexible, gender-balanced groupings of children, opening new avenues for friendships or association through common interests. The children also developed a strong sense of place and belonging to their own natural environments as they discovered the synchronicity between their local environments and the reflection of it through the preschool program. The following table summarises the outcomes for the children.

Table 9.2: Changes observed by stage during children's participation in the study

Stages	Understandings and attitudes toward the natural world	Behaviour toward the natural world	Group dynamics and interactions between children
Stage 1	• Language describing the natural world was simple and noun based. Some adjectives. • Basic understanding of where food comes from. • Enthusiasm for songs and movement depicting the natural world and recognition of characters in the songs. • Curiosity toward story content.	• Oriented around sustainability activities such as gardening, recycling and water conservation. • Creating animal, plants and habitat through drawings and sculpture and play scenes. • Expressions of care for animal and habitats while playing.	• Play with natural materials was unstructured. • Intense investigation of natural materials. • Small group creation of play scenes. • The beginning of individual animals and plants as play characters within play scenes. • Group movement affected by images and song.
Stage 2	• Specific understanding of habitats, food and lifecycles. • Understanding of scientific concepts such as rainbows and photosynthesis. • Emerging understandings of inter species relationships and mind map of what exists in local environment. • Predictions about story characters and plots. • Children declare their own understandings of flora and fauna.	• Identification with and concern for individual characters in stories. • Expressions of care and nurture heightened when educators told stories. • Creation of homes for animals using a variety of media that include appropriate food and materials and meet emotional requirements i.e. contain friends or animals related to main character.	• Creation of artefacts used for surrogate friendships or interest based liaisons. • Family groups of animals emerged in play with children taking roles. • A range of dynamics specific to the animal kingdom evident in play. • Play scenes more complex and small groups representing specific interests in specific animals or habitats formed. • Some children show attachments to play scenes and use them for comfort.
Stage 3	• Children are familiar with animals and plants in local environment. • Expression of animal and plants becomes complex and multifaceted through all arts media. • New concepts mastered such as germination, pollination, camouflage and symbiotic relationships. • Language reflects meta-understandings of interactions and dynamics between animal species and their habitats. • Children tell each other complex stories about the natural world with many characters, family groupings, diets and habitats specified.	• Children suggest stories based on local flora and fauna with their own ideas for plots - most of which were to ensure the characters were happy or well supported. • Movement representing elements such as wind and water became nuanced and expressive. • Many artifacts created in discretionary time that represented the natural world. • Play with animal family characters depicted complex concerns and contained well considered resolutions to problems.	• A sense of belonging is depicted in play with characters reflecting their attachment to 'their place'. • Children use analogies of animal habitats and feelings to describe the rules of play. • Children remind each other to act in particular ways depending on the characters they are playing and their inherent characteristics. • They experiment with mock threats between animal species or elements and animals and find collective solutions to solve them.

Chapter 10
Successes and Challenges: Implications for Early Childhood Education

This chapter summarises the outcomes of the research and discusses the challenges encountered during the research and the areas in which they could be overcome in future iterations of the research design. The implications that the findings and their analysis have for future practice in environmental education in early childhood will also be examined. In addition, this chapter identifies where the findings raise additional questions and suggestions for further research.

Summary of outcomes and conclusion

This research set out to determine the effects of working with early childhood educators and children to implement content about the natural world regularly into their programs through the creative arts. This project was underpinned by the ecologically based concept of biophillia and paradigms of ecopsychology and deep ecology (Wilson 1984; Naess 1989; Roszak 1998), and the emerging discourses they offer about our intrinsic connection with all things biological and a conceptualisation of the self that includes the natural environment.

There were two main questions in this research project. One is related to the educators and the other to the children. Outcomes related to each of these questions are set out below.

Research Question1 asked how self-generated creative arts experiences can assist early childhood educators to support young children to learn about the environment. The three main areas investigated in order to answer this question were the extent to which implementing self-generated creative arts experiences helped educators to incorporate information about the natural world into their programs, any changes in their attitudes and understandings of it, and their connection to the natural world.

With regard to the educators' incorporation of content about the natural world, this research has shown that with modelling and scaffolding there was a major increase in the volume of program content about the natural world. The educators used stories and related creative arts experiences to implement reflective and relevant program content about the local natural environment for the children. The variety of arts experiences they used to do this and the frequency and detail of the experiences are evidence of an early childhood program that has content about the natural word embedded as an every day aspect of it. The educators' responses to the survey questions at the end of the project are also consistent with the main findings. The educators clearly stated that they now incorporate many more strategies for presenting content about the natural

world in their programs, and that these strategies are based on the creative arts and, in particular, storytelling.

The educators' understandings and attitudes toward the natural world were also affected as a result of this research process. The language the educators used as storytellers gradually changed over the three stages of the research, becoming more detailed and complex, revealling an interlinked web of concepts about the natural world that reflected their local environments and their approach towards it. The considerable time spent by the educators in researching the flora and fauna in their local areas, in order to create stories that were based on fact, resulted in them understanding more about the range of plants, animals, birds or insects, and their social dynamics and habitats. Throughout the research, the educators developed skills in balancing the factual and creative paradigms and engaged in a process of creatively rendering facts into story narratives and then into creative arts experiences. This provided an additional way of experiencing the factual elements and understanding them.

The educators' responses to the survey questions at the end of the project also reflected changes in the their understandings and attitudes toward the natural environment. They commented that key influences on their understandings of the natural world included exploration of it through the arts, and learning about the local flora and fauna. They also said that the natural environment was a key part of our identity as human beings and this sense of identity included a sense of belonging and sense of place.

The educators' sense of connection with their environment was the subject of the final sub-question related to them and there were many changes in this regard. Initially, the range of practices implemented in the preschools reflected a connection with the natural world that was strongly linked to beliefs about being an environmentally responsible citizen and educator. Over the course of their involvement in this research, the educators' sense of connection with the natural world was enhanced as a result of their engagement in a range of creative experiences and knowing the subject of investigation through cognitive, affective and physical modes of experience. This was evident through the content of their stories, the language they used when telling stories or talking to the children about the natural world, their feedback throughout the process and the extent to which they included content about the natural world into their programs.

The educators' responses to the survey questions about what they felt was important for children also reflected their connection with the natural environment indirectly, and/or their belief that being connected to the natural world was important. Their responses included a belief that it was important to foster a love and appreciation

for the natural world and its beauty, and to help children to know it is their home. The eductors also said it was important to ensure that children were not afraid of the natural world and were exposed to it through a variety of creative media. They saw themselves as playing a significant role in assisting the children to develop a connection with the natural world, citing the relevance of the preschool as a link between families and children.

Research question 2 asked about the effects on the children of exploring the natural world through the arts as a regular component of the early childhood program. In particular it focused on the children's understandings of, and behaviour toward, the natural world and the way in which their engagement in the research program has affected their interactions.

The research program incorporated content about the children's natural world through a variety of media that characterised the flora and fauna of their local environment. As a result, the children developed an interest in the characters, began to identify with them and to understand them. This was apparent through all aspects of their creative expression from visual arts to drama, movement and music. Guided teaching was an important element of their engagement in these processes assisting the children to understand growth processes in the natural world.

At the conclusion of the research, the children's expressions of and understandings about the natural world had become complex and integrated. The language they used to describe the natural world became very specific; identifying particular species of plant, animal, insect or bird, and attributing them with feelings, motivation, wisdom and descriptors denoting a sense of belonging. In their drawing and in their play they expressed a greater understanding of what animals needed in their habitats. They incorporated new understandings of environmental concepts such as photosynthesis, refraction and camouflage, and reflected a high level of complexity in the range of creative expressions they used.

The complexity and nature of the children's behaviour toward the environment also developed during the project. At the beginning of the research process, the children's behaviour toward the environment was most evident through their sustainability activities. Their notions of care with regard to local flora or fauna were minimal; conceptualising them as generic species with generic needs, although they did at times reflect a notion of having to look after the natural world for the sake of the planet. At the conclusion of the research process, and as result of having explored the flora or fauna extensively through creative experiences, the complexity of the children's expressions, reflecting elements of the natural world, had grown considerably. They

now included representations in which specific characters and species had the correct food, the right type of shelter and sufficient companionship. Rather than being simple anthropomorphic transference of what they thought the animals might feel or need, their understandings now reflected detailed knowledge of and empathy with the needs of the member of the natural world in question.

This empathy coincided and became more pronounced with the naming of the story characters and when the educators told the stories. The children identified more strongly with named characters and with the stories told by their educators, particularly when they were more frequent. The educators, and the stories they told, belonged to the same framework of reference the children had regarding the natural world and this may be a significant factor in the children in finding enhanced meaning in or identification with them. This should be considered in any repetition of this research.

It is possible that what has been characterised here as changes in children's behaviour toward the natural world, can be attributed to the frequency of content about the natural world and the expanded knowledge the children gained, rather than any changes in their affective disposition. Regardless of the specific cause, the children's behaviours reflecting care, compassion and nurture were expressed through many media and on a daily basis in the program.

The third sub-question related to the children's interactions and whether there were differences in them that can be attributed to the regular experiences of creatively presented information about the natural environment. The children demonstrated a number of new social groupings during their participation in the research. There were specific periods of collaborative whole group activity when using the natural materials for unstructured play in the playscenes, when sitting together as a group in a circle formation on chairs for stories, and when engaged in drama and movement experiences that focused on the natural world. There were also many instances of small groupings of children playing together who may not have normally done so. This appeared to be driven by the children's interests in particular creative arts experiences, or types of play, that had been introduced or fostered as part of the research. There also appeared to be a balanced gender representation of children in small groups. This was unplanned and undirected, and appeared to be a result of the children's interests in specific expressions of the content.

The children's three-dimensional creative artefacts also provided opportunities for surrogate friendships between the children. Their puppets or sculptures provided an alternative entry point into play and encouraged recognition of similar qualities and of

differences. The children's role-play became more complex and involved many acts of caring, cooperation and friendship that drew upon social dynamics in the natural world. This in turn reflected a broad and multifaceted discourse about the natural world within which all of the children became competent communicators; creating a sense of belonging to a group and a sense of belonging to their own natural environments. This cooperation and identification with the natural world also harks back to Gomes and Kanner (1995), who say that it avoids hyperindividuality and supports a relational interactiveness that empowers individuals and fosters creativity and growth. This is a model of growth that is not dependant on overpowering another.

The outcomes for both the educators and the children indicate that the incorporation of content about the natural world, through educator generated creative arts experiences, as a regular component of the early childhood program has positive benefits. The educators were able to incorporate daily content about the natural world through a program that was reflective, responsive, factually-based and creative. They developed understandings and attitudes about the natural world that enhanced their connection to it and, in particular, their connection to their own local environment. The educators became stronger advocates for their local environment and saw themselves as the link between it, the children and the children's families.

The children benefited from the program by developing a detailed understanding of their local natural environment, a strong sense of empathy with it and the knowledge that they are intrinsically connected with it. Through their understanding of the natural world they developed the capacity to draw from it examples of social dynamics and cooperation that they can use in their play and other interactions. They surrendered to a deeper sense of wonder for the natural world, connecting what they experienced through the content at preschool with their outdoor experiences in their local areas.

Challenges

The implementation of this research posed a number of challenges. These included having sufficient time to spend with the educators in the preschools, before and after sessions. The predominance of play-based pedagogies was evident in the research sites and the introduction of intentional teaching in creative arts, such as drawing and sculpture, was a departure from common practice in the preschools. This was accompanied by the educators' lack of belief in their own creativity, which was particularly evident in the area of music. The complexity and unpredictability of early childhood settings was also a challenge at times and meant plans needed to be changed at the last minute. A flexible approach to the research was necessary in order to take account of this, and the qualitative methods employed in this research enabled me to adapt to the circumstances at hand. The challenges are discussed in detail below.

Time available for interactions with educators

The original design of the research project was to work in a group with the educators on a monthly basis using an action research format facilitated by focus groups/ workshops. The rationale behind this approach was to provide opportunities for the educators to learn new techniques for presenting the natural world through the arts, to share their successes and challenges at subsequent gatherings, and in turn learn from each other. However, this out of work hours format was not manageable for the participants, so visiting the preschool settings and modelling the techniques became the preferred option.

The disadvantage of this approach was the limited time the educators and I had for discussing the session that was to be presented, or what the educators thought about it afterwards. The educators did ask questions about the content but there was limited time to do so when they were responsible for the supervision and guidance of the children at the same time. I was also conscious of not taking up too much of their time because, as in all care and education settings, they were very busy. This also applied when phoning the educators to discuss the up coming session or to debrief on the last. Even though these discussions occurred regularly, there were times when the educators were not available or when their work days did not coincide with the time of the calls. As I was working in a full time managerial position, my ability to find mutually suitable times was also restricted. While we got as much as possible from the process of phone collaboration and limited discussion during my visits to the preschools as possible, the ability to sit and discuss the progress of the research with the educators, face to face, would have been useful for both parties. It may have assisted the educators in developing skills that would have enabled earlier and more comprehensive implementation of the content. It may also have yielded additional information that would have informed the support I provided to the educators.

Incorporating new teaching and learning pedagogies

One of the key aspects I was attempting to model was the extent to which a program based on the children's interests and awareness of the natural world can intersect with intentional teaching (DEEWR 2009) and become self-perpetuating. When a topic that captures the children's interest and imagination arises, the educator can draw from it many different elements that are relevant to the content they wish to teach or focus on with the children. The direction in which the educator then takes the subject matter will elicit responses from the children that in turn suggest further investigation in one area or another. This is not new in the early childhood sector and is consistent with Emergent Curriculum, Reggio Emilia inspired programs and elements of socio-cultural

programs (Fraser 2000; Arthur 2001; Fleer, Edwards et al. 2006; Arthur, Beecher et al. 2008), albeit more oriented to the local natural environment. The difference is that the educators were not accustomed to applying this approach using the natural world as the subject matter. Due to the lack of familiarity and/or a limited knowledge base, the educators found they had to spend considerable time researching the topics from their local environments and then challenge themselves to render them creatively. This is on top of the already considerable demands and stresses on early childhood educators (Kelly & Berthelsen 1995; Noble & Macfarlane 2005).

My research demonstrates that it takes considerable time and practice for familiarity to develop and for educators to have the confidence to render topics in creative media. I found that the educators' initial exposure to, and then practice of, the techniques once per month at the beginning of this research process, was barely sufficient to maintain momentum. Indeed, when one of the educators did tell a story in between sessions, and it did not 'work' as far as she was concerned, she was greatly discouraged and did not create another story for a couple of months. When the educators began to tell stories monthly, and then in between sessions, and to link them to creative experiences, the level of their engagement and confidence increased and the enthusiasm for the process was greatly enhanced. This is consistent with Daniel Meier's (2008) finding, where he reports on the outcomes of a course he ran in narrative enquiry for experienced early childhood educators. The educators believed that they could not write poetry in the beginning but toward the end of the course 'an increasing number of students used poems to render vignettes and stories from their practice' (p.67).

Self-belief in creative abilities

Another obstacle was the lack of belief the educators had in their own creativity. Initially I developed the stories in collaboration with the educators. However, in the early months I was very much the 'driver' of the plot and characters, asking them for their approval or for additional comment or contribution. As the months went on, the educators began to see what was possible and where to begin with researching their characters. This research was a way into the storytelling process but had its own drawbacks, in that there was a bridge required to take the facts discovered into the narrative. The faculties needed to transform the information, and that allow the educators to see differently, are the 'senses – the heart and the mind and the soul' (Meier 2008. p 61). The contrast with rational and analytical thought is obvious, and it may be that engagement in the art forms with which the educators were familiar assisted in developing the faculties they needed for story writing and telling. The educators easily embraced the visual arts and as it transpired this was the strongest area of expression of the natural world overall.

The challenges that movement and music posed were not embraced nor overcome as readily. Each month I went into the preschools with a fully developed song or songs (on most occasions) put to music and ready to sing with the children. The songs were structured in rhyming verse turned to melody and put to very simple chords on guitar (I am not a musician). These completed artefacts, presented through vocals and guitar, represented a level of musical creativity and skill that the educators could not see themselves developing without specific focus and considerable time. None of the educators played instruments, or considered themselves to have musical ability, so the completed songs became one of the barriers to the educators becoming involved in generating their own music. There were a couple of occasions where I went in with very simple four line songs that had no instrumental accompaniment (due to lack of time) and these songs were more accessible to the educators because of their simplicity. There was one occasion where an educator wrote a song. It contained four lines and was put to a borrowed tune. It was appropriate in the context in which it was used and represented an enormous step for the teacher educator but also highlighted the challenges the educators face in this area.

The anxiety that educators face in early childhood when they do not have formal training in music is documented by Russell-Bowie and McInerny (2002), who found that student teachers bring well established attitudes toward music and their musical abilities to generalist educator pre-service courses, and these are strongly influenced by the musical experiences they have had at home or at school. Where these are minimal they 'have negative attitudes and low self-esteem in relation to their ability to teach these subjects' (p. 6). In addition, the Music Council of Australia reports that musical interactions in family homes have been diminishing over the past ten years and music education in schools in inadequate (de Vries 2008).

In spite of the challenges, the educators participated in and developed new skills and understandings in all of the areas in which we worked. They applied their ever growing knowledge of the natural world to all areas of their program with the children, highlighting many successes along the way.

Successes

There were many successes in the design and implementation of the research and they would be useful components of similar research projects or those that focus on specific aspects of children's and educators' engagement with the natural world.

Modelling and scaffolding

Spending time in the preschools with the educators and modelling the storytelling process was useful. This provided the educators with examples of storytelling craft and construction, and of the depth of the children's responses to them. It also highlighted the extent to which storytelling can bring to life the subject in hand and encompass a number of characters in a given setting or, in this case, animals in a habitat. Enabling the researcher to connect fully with the children through the creative process of storytelling, and in the follow up experiences, provided the educators with a model of how engaging these interactions can be and the power they have in communicating information. In the period that I was telling the stories, the collaboration with the educators increased and their expressions reflecting the story content developed in other media such as the development of storyscenes, playscenes or displays. Although a workshop setting would have provided time and opportunity for focusing on the how and why of storytelling, it would not have demonstrated the interactive connection between the storyteller and the children. Another benefit of going into the preschools was that I was working with all of the staff rather than just with one educator. This was beneficial for all of the staff who were observing and being actively involved in the sessions I conducted. The compounding benefit of this is the value of all of the educators and staff learning new skills and developing new understandings together.

Levels of participation and engagement

The children were all actively involved in the experiences presented, although their participation in the project was voluntary, demonstrating that the creative arts is an effective means of engaging children in environmental education. The preschools all offered alternative activities for children who did not wish to take part. However, all of the children participated in the stories. There were some occasions during the creative movement sessions where one or two children in the group sat and watched rather than participating, but this could not be called disconfirming evidence as this reticence was overcome later in the visits when there were additional opportunities to be involved. There were also three occasions where some of the children did not participate in the drawing or painting sessions but this had more to do with there not being space at the tables and having to wait for a second round. All of the content and the creative experiences (or the materials used for them) were new so the children were curious. The discussions during the stories, and after when they were engaged in visual arts experiences at the tables, were animated and focused on what they were doing in the medium with which they were working or on elements of the story that preceded the activity. There were a number of instances throughout the research where the children commented on being better drawers or painters now (see Chapters 7 and 9). Regardless

of the medium in which we worked, we explored the process of creating the image, the form or the movement. The facilitation of the children's skills in these areas and the consequent creation of artefacts with which they were satisfied, appears to have been a motivator in their participation.

The value of natural materials

The use of natural materials in the early part of the research process was also very successful. The children were very interested in them and used them creatively, in context (after exploring them for some time), and extensively in their playscenes. The children also used them for representational or symbolic play (Dockett & Fleer 1999; Hamilton & McFarlane 2005), broadening the scope of characters they nominated in their play sessions. The extensive play periods that the children engaged in with these materials provided them with opportunity to explore the objects they had and to create a context around them (much of which came from the stories preceding the play sessions). This play also gave the educators insight into the children's schema about the subject matter, which in this case was their immediate natural environment (Koeppel Strasser 2000).

Guided teaching in the arts

One unanticipated outcome of the research process was the success of guided teaching. The guided drawing and sculpture sessions were well received by the educators and the children, and resulted in many complex and detailed drawings and sculptures that reflected considerable understanding of the natural world and the process of the subject's development or growth (see Chapters 5, 6 and 7). This project did not seek to compare the children's proficiency as drawers or sculptures between the beginning and end of the research project, or to create artists, but inherent in the techniques used to teach the children were tools to help them express their concepts of the natural world. Ursula Kolbe (2001) provides many suggestion on how to assist children in the process of creating drawings and these include going through the steps required to create the image. The only difference in the guided drawings we conducted was that we followed a process that reflected growth cycles in nature, and all of the content in the drawings was related to the natural world.

Arapaki and Zafrana (2004) highlight the lack of research into the effects of systematic teaching in the arts. However, their study shows that narration, observation and discussion are useful tools in assisting children to understand what they are going to draw and what they do draw. Their studies also show that all aspects of children's drawing become more complex and contextual after guided teaching processes.

With this in mind, it is not surprising that the level of drawing and sculpture in the four preschools, according to the criteria applied by Arapaki and Zafrana, contained complexity and form that was well developed for their ages. The educators could also see how these processes assisted the children in understanding the concepts and processes related to the natural world, and the way in which they assisted the children's expressions of them. The educators commented that they would continue to use them. When we consider the importance of children being confident about expressing themselves through the arts, providing them with tools to assist them in developing the skills and the confidence to engage in artistic expression becomes a most important educational imperative.

Future research

There are a number of ways in which the current research project could be enhanced if it were to be repeated. There are also some areas where the current research suggests areas for further investigation. The following paragraphs explore these topics.

Future iterations of this research would be strengthened by providing educators with adequate support in developing skills in the arts. Then the benefits of applying specific arts media in early childhood settings would be more clearly ascertained. Based on the findings of this project, the areas of most need are music and drama/movement. Regular workshops and learning sessions where educators could learn new skills and techniques to apply in their early childhood settings would assist them in embracing new content through the different media, and in developing self-generated material for use in their early childhood programs. Wyverne Smith (2008) found that learning a musical instrument in childhood provided a sense of confidence, self esteem and the ability to use another language for emotional expression. It is a small leap of logic to consider that many of these benefits would be available to early childhood educators who learned music at some level as part of their professional development.

Sessions to support the educators to develop their skills in poetry, storytelling and drama narratives would also assist with their confidence in exploring their environments and the socio-cultural interactions within them (Sherwood 2006; Adcock & Ballantyne 2007; Meier 2008; Tooth & Renshaw 2009). Story writing and telling were new skills for all of the educators as was the idea of dramatising a story, particularly one based on the local natural environment. As narrative and drama are such effective adjuncts to understanding (Adcock & Ballantyne 2007; Curtis 2007; Tooth & Renshaw 2009), they have emerged as important skills for educators to have.

Although the educators had varying levels of proficiency and confidence in the visual arts media, this was predominantly expressed through familiarity with a range of

materials and knowledge of how they could be applied. Enhanced understandings of intentional teaching techniques and content that would reflect the natural world would therefore be beneficial. This would assist in exploring additional ways of reflecting the growth processes in the natural world using a variety of materials.

The outcomes of this research offer many possibilities for follow up projects. One area for future work would be to investigate the effects of storytelling and narratives about the natural world in early childhood settings, where families and children are involved in the development of the narratives in collaboration with the educators. This could highlight the voices of children and family members as they explore and reflect on their local natural environments together, privileging their perspectives and offering a greater sense of agency in the outcome. There were optional family surveys used at the commencement of the current project but less than 6 percent of families completed them. The families who returned the surveys indicated that they would like their children to learn about and experience more of the natural world.

A community narrative or ongoing multifaceted story coordinated through the early childhood setting and involving adults in the community, may further assist children in developing ecoliteracy (Capra 1999) and biophilia (Wilson 1984; White & Stoecklin 2008). It may also assist the adults involved in developing deeper connections with the natural world. While the terms ecoliteracy and biophilia relate to understanding ecological discourse and having a connection with life, what was gleaned from the children's immersion in the natural world toward the end of this project hinted at something deeper. It seemed that the natural world was part of the children's everyday consciousness in all its animal, insect and plant detail and these details were interrelated. Perhaps the building of these metacognitive maps of the immediate natural world, in the centre of which the child is a thinking, feeling and creating being, may be called an ecoschema or ecomprehension. To include families in this process may help to complete this ecoshema by engaging this key element of the child's life. It is from this state of being and knowing that children can draw upon a rich vein of examples of social dynamics, symbiotic processes, the wisdom of ecosystems and the endless restorative qualities of the natural world.

Implications for early childhood settings and pre-service teacher education programs

The outcomes of this research highlight some challenges for early childhood settings. Not least of these is the common practice of play-based pedagogy. Constructivist and developmental theories have underpinned the use of play-based pedagogy in Australia and, in spite of emerging theoretical perspectives about the importance of early

childhood teaching pedagogies reflecting the children's social and cultural experiences intentionally, play-based pedagogies are still a strong influence (Cutter-Mackenzie & Edwards 2006).

Incorporating deliberate teaching of content into the early childhood program has been advocated in Australia (and internationally) over the last ten years by a number of researchers and commentators (Dockett & Fleer 1999; Fraser 2000; Cutter-Mackenzie & Edwards 2006; Fleer et al. 2006; Arthur et al. 2008). Intentional teaching is also incorporated into a number of pedagogies and teaching approaches including socio-cultural pedagogies, Reggio Emilia, Emergent Curriculum, Montessori and Steiner Education. In Australia, intentional teaching is now also being promoted through the Early Years Learning Framework (DEEWR 2009) which will affect all prior to school education and care services as this framework is linked to the new National Quality Standards for early childhood services (DEEWR 2010). Contemporary approaches do not position play-based and intentional teaching pedagogies as mutually exclusive, as they also promote play as an important part of children's learning and advocate educators' active involvement in children's play. In spite of this, pedagogies that incorporate intentional teaching, have been resisted and play-based pedagogies are still prominent to a great degree in early childhood settings in Australia (Cutter-Mackenzie & Edwards 2006). This may be due to the historical dominance of play-based pedagogies and the time involved in developing new paradigms for practice coupled with a lack of professional development opportunities available for educators. However, I also suspect that the pressures on early childhood educators make play-based pedagogies attractive as they lift from them the burden of having to specifically determine and prepare content. The fact that there have been no guidelines about what intentional educational content is appropriate in early childhood compounds this problem.

While there are emerging voices specifically advocating intentional teaching about the environment (Cutter-Mackenzie & Edwards 2006; Davis & Ferreira 2009; Gambino, Davis et al. 2009; Young, Ellen et al. 2010), there is a risk that in practice it will be interpreted through didactic approaches that focus on conceptual knowledge and the problems with the environment, and not on assisting children to develop a life-affirming connection with it. On the other hand, as teaching for sustainability or environmental education appears in the Early Years Learning Framework (DEEWR 2009) and in the draft Australian Curriculum (ACARA 2010) as a cross curricula, integrated topic, there is also a risk that environmental education will be diluted to the point of being ineffective in assisting educators to develop programs that help to connect children to the natural world. This tension may be relieved, in early childhood settings at least, by implementing a program of learning about the natural world as

a deliberate area of focus, integrated across all subject areas through the creative arts. As this research has shown, this may help to ensure children develop this vital understanding of, and connection with, the natural world, and that educators have varied and flexible methods of implementing these programs.

However, in order for educators to incorporate this content effectively, professional learning opportunities at pre-service level are needed to support their development of skill and knowledge. As the arts in general are an area in which many educators feel they are limited (Meier 2008), education in the arts, about the environment, and about how to assist children in developing a strong connection with the environment through the arts, would assist educators in embracing education that focuses on the natural world in a positive life affirming manner. Indeed the combination of professional learning courses that assist early childhood educators to connect with the natural world through a variety of arts media, and through outdoor experiences, would help to provide a foundation for exploration of the natural environment in the communities in which they educate young children.

Another longer-term implication for the early childhood sector highlighted by this research, is the extent to which early childhood educators feel the need for support in order to engage in and develop music experiences as part of their program. With this in mind, providers of early childhood pre-service courses need to consider the effectiveness of the music components of their programs. According to Dr de Vries (2008) the time allotted to music is inadequate for pre-service educators to develop any sense of proficiency or confidence in teaching music in their classrooms.

The professional learning opportunities recommended above have focused on pre-service learning opportunities. However, for practicing educators, professional development opportunities need to be offered that do not add to the their workloads. This would require additional funding so that educators can take time from their daily programs that is sufficient, and allows for a gradual development of expertise. Ongoing learning experiences, such as educators being involved in action research projects or being supported by a critical friend, would be of benefit as they encompass reflective learning experiences and development of metacognitive schema.

Final comments

This researh has shown that educator-generated arts based pedagogies that focus on the natural environment and that are implemented on a regular basis in early childhood settings, can have a profoundly beneficial effect on educators and children.

These arts based pedgogies provide a means of incorporating ongoing, living, content

about the natural world into the early childhood program and assist educators in developing a comprehensive understanding of their local natural environment. They also have a profound effect on the connection the educators feel with their local natural environment and their beliefs about their roles as environmental educators of children.

The children's understandings of, and behaviour toward, the natural world have also been dramtically affected by their participation in this resarch. Their understandings of the environment became detailed and nuanced with local knowledge assisting in the develpoment of a sense of place and belonging in the natural world. Their behaviour toward the natural world and their interactions with each other reflect the inherent wisdom of ecosystems and the symbiotic cooperation in the plant and animal kingdoms. Both the educators and the children involved reflected a deep understanding that the natural world and their lives are intrinsically intertwined.

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Appendices

Appendices Contents

Appendices 1
Consent and information forms for families and educators and licensee

Appendix 1.1 Educator information sheet

Locked Bag 1797
Penrith South DC NSW 1797 Australia

College of Arts, School of Social Sciences
Associate Professor Meg Smith
Rm 1.1.13 Bankstown ph 61 2 9772 6299

University of Western Sydney
Bringing knowledge to life

Educator Information Sheet for the Research Project:
Enhancing the Ways in Which Early Childhood Educators Scaffold Young Children's Learning About the Environment by Using Self-Generated Creative Arts Experiences as a Core Part of the Early Childhood Program

Dear Participant,

You are invited to participate in the above research project. The following is designed to inform you about the project and your participation in it.

The research will be conducted by Kumara Tarr: a Doctor of Philosophy candidate at the University of Western Sydney. She is a qualified early childhood teacher, primary school teacher and teacher of adults. She also holds a Master of Social Science degree. Her primary supervisor is Associate Professor Meg Smith of the School of Social Sciences: College of Arts. Her contact details appear below. This research project has been approved by the Human Research Ethics Committee of the University of Western Sydney as per the information included below.

The Research:

This research will investigate the outcomes for children and teachers of exploring the natural world or environment using the arts. The researcher will meet with you monthly to guide workshops and focus groups over a period of nine months: from July 2008 to April 2009. These meetings will run for between 2 and 3 hours each. The aim of these meetings/ workshops is to share and develop with you, new techniques for working with children creatively that can assist their understanding of the natural world through the arts. You will be invited to integrate these techniques into your daily work with the children. It is anticipated that over the time period, an enhanced understanding of the natural environment will, be reflected in the children's play and in their interactions. The research will investigate your perceptions of the effectiveness of the arts in integrating environmental content into your early childhood program and the extent to which the children's understanding of the natural world has been enhanced. There are two key research questions, each of which give rise to sub questions:

1. In what ways can self-generated creative arts experiences assist early childhood educators to support young children to learn about the environment?

    - Does working through the arts assist the educators in incorporating information about the natural world into the program for the children?

    - What effect does the research of flora, fauna and natural phenomena, and

the development of creative experiences, that the early childhood educators will engage in, have on their understandings of or attitudes toward the environment?

- In what way does working through the arts to develop experiences about the natural world or the environment for the children, affect the educators' sense of connection with their local environment?

2. How do early childhood educators perceive the benefits for children of experiencing creatively presented material about the natural world as regular content in the early childhood program?

- Do the educators perceive any changes in the way in which the children express their understandings about the environment?

- Do the educators perceive any changes to the way in which the children behave toward the natural world or environment?

Do the educators perceive any differences in the interactions between the children that can be attributed to the regular experiences of creatively presented information about the natural environment?

How will you be involved?

Meetings/Workshops

You will meet with the researcher for a series of monthly sessions over a nine-month period: from July 2008 to April 2009. During these meetings you will be asked to complete a questionnaire that will be applied three times over the period of the research process. This is in order to examine if, and in which ways, your responses to the questions change. Your participation in the project will be in the form of an action research approach. This means you will, in the workshops and focus groups, collaboratively develop specific techniques to assist you to include creative content about the natural world, particularly the natural flora and fauna in your local areas, into your daily interactions with the children. You will in turn, develop and integrate into the children's program, additional stories, songs, verses and visual arts experiences that reflect this content. You will continue to observe the children in your care to monitor the extent to which this content is incorporated into the their play and their understanding. Subsequent meetings with the researcher, and other early childhood participants, will be aimed at sharing information about the children's responses, the variations and adaptations that you have applied during the implementation, and in refining and extending the techniques used.

Data collection and analysis

Data will be collected in a variety of ways. Initially, you will be asked to complete a questionnaire about your familiarity with the natural environment, the methods you use to assist the children to understand this topic and the ways in which the children reflect their understandings of the environment. This schedule of questions may be used on two or three occasions throughout the research period. You will also complete a weekly reflective diary on the techniques you have developed and the effect of their implementation on your pedagogical

practices throughout the period of the research. The focus groups, attended by all early childhood educators, will also be recorded and transcribed. These transcriptions will be analysed with your assistance. You may also collect data by recording a variety of written observations on the children, gathering the children's work samples, creating photographic essays, audio/visual records and learning stories. You will be welcome to bring these artefacts, or those that you have created, i.e. songs, stories, artworks, to the focus group sessions for sharing.

Benefits

Although you may find initially that you are recording additional information about the children and your own exploratory process, you will develop new techniques to enhance your ability to creatively include your knowledge of the natural world, and your capacity for developing resources for use in every day activities with the children. This may result in a time saving as resources to support the content of the program will be more readily available and the ongoing content of the program will become self-perpetuating. This is because you will be engaging in a process of incorporating and extending the children's interest in, and awareness of the local natural environment as a regular part of your programming.

The children will learn additional information about the natural world. They will learn about the dynamics of social relationships between animals, the habitats they frequent and require, and the flora in their local environment. You may find they request additional stories from you as they identify with the characters in them and see the qualities of them reflected in their environment.

Confidentiality, your participation and outcomes

You are free to withdraw at any time during the course of this research. You will not be obliged to provide any explanation for your withdrawal.

All records of participants and the data they develop will be coded so that participants will not be able to be identified. Records will be kept secure in locked filing cabinets in the researchers home or in the office of her supervisor.

At the completion of the research you will be informed of all findings through your involvement in the collating of the data (see above) and by being provided with a copy of the findings collated and documented by the researcher. It is also anticipated that these findings will be published in refereed early childhood journals.

If you would like any further information about this study, please contact the researcher or her supervisor. The contact details are as follows:

Researcher: Kumara Tarr 0411 100 605

Supervisor: Associate Professor Meg Smith 0431072943

NOTE: This study has been approved by the University of Western Sydney Human Research Ethics Committee. The approval number is HREC H6188. If you have any complaints or reservations about the ethical conduct of this research, you may contact the Ethics Committee through the Research Ethics Officers (tel: 024736 0883 or 4736 0884). Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome

Appendix 1.2 Educator consent form

Locked Bag 1797
Penrith South DC NSW 1797 Australia

College of Arts, School of Social Sciences
Associate Professor Meg Smith
Rm 1.1.13 Bankstown ph 61 2 9772 6299

University of Western Sydney
Bringing knowledge to life

Educator Consent Form for the Research Project:

Enhancing the Ways in Which Early Childhood Educators Scaffold Young Children's Learning About the Environment by Using Self-Generated Creative Arts Experiences as a Core Part of the Early Childhood Program

Dear Participant

You have been invited to participate in the above research project. The following form is designed for you to indicate your consent to participate. The research will be conducted by Kumara Tarr: a Doctor of Philosophy candidate at the University of Western Sydney from July 2008 to April 2009. She is a qualified early childhood teacher, primary school teacher and teacher of adults. She also holds a Master of Social Science degree. Her primary supervisor is Associate Professor Meg Smith of the School of Social Sciences: College of Arts. Her contact details appear below. This research project has been approved by the Human Research Ethics Committee of the University of Western Sydney as per the information included below.

Participation

If you chose to participate, you will be free to withdraw your participation in part, or completely at any point during the course of the research. You will not be obliged to provide any explanation for your withdrawal. Your participation in this project involves:

(Please tick the areas you **<u>are</u>** willing to be involved in) ✔

• Attending a series of workshops and focus group sessions with the researcher	
• Applying techniques learned during the sessions, in the class room as per the information form attached	
• Recording any significant changes to your teaching practice as a result	
• Developing/recording information about the outcomes for the children as a result the additional content taught in the program or the teaching techniques	
• Participating in a collaborative analysis of all records developed by you during the project	

If you would like any further information about this study, please contact the researcher or her supervisor. The contact details are as follows:

Researcher: Kumara Tarr 0411 100 605

Supervisor: Associate Professor Meg Smith 0431072943

I hereby give my consent for participation in the above study.

Name……Signed……Dated……..

Appendix 1.3 Educator questionnaire

Locked Bag 1797
Penrith South DC NSW 1797 Australia

College of Arts, School of Social Sciences
Associate Professor Meg Smith
Rm 1.1.13 Bankstown ph 61 2 9772 6299

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Educator Questionnaire for the Research Project:

Enhancing the Ways in Which Early Childhood Educators Scaffold Young Children's Learning About the Environment by Using Self-Generated Creative Arts Experiences as a Core Part of the Early Childhood Program

The following questions will be used to gather information from the teacher participants in the above research project:

1. What, if any, are the benefits for children when they have a good understanding of the natural world?

2. What do children know if they have a good understanding of the natural world?

3. How do they develop their understandings of the natural world?

4. What role does/can the preschool environment and the programs they offer, play in enhancing children's understanding of the natural world?

5. What skills/understanding does a childcare professional need to assist children to understand the natural world?

6. How/where do *you* develop your understandings about the natural world?

7. What strategies do you currently incorporate into your program to assist children to learn about the natural world?

8. What effect does this have on the children's understanding of the natural world?

9. What language/words/concepts do the children use when they talk about the natural world?

10. When do they do this?

11. How is the local community and environment related to a child's understanding of the natural world?

12. What role can the community and the local environment play in assisting a child to develop an understanding of the natural world?

13. In what way, if any, is an understanding of the natural world important for children to develop as environmentally responsible citizens?

Thank you for your participation in answering these questions.

Appendix 1.4 Parent information sheet

Locked Bag 1797
Penrith South DC NSW 1797 Australia

College of Arts, School of Social Sciences
Associate Professor Meg Smith
Rm 1.1.13 Bankstown ph 61 2 9772 6299

University of Western Sydney
Bringing knowledge to life

Parent Information sheet for the Research Project:

Enhancing the Ways in Which Early Childhood Educators Scaffold Young Children's Learning About the Environment by Using Self-Generated Creative Arts Experiences as a Core Part of the Early Childhood Program

Dear Parent/Guardian,

Your child's educator has been invited to participate in the above research project. This may result in the content of some of the program experiences in your child's room varying, in order to focus on the natural world or environment. The following is designed to inform you about the project and the outcomes it may have for your child.

The research will be conducted by Kumara Tarr: a Doctor of Philosophy candidate at the University of Western Sydney. She is a qualified early childhood teacher, primary school teacher and teacher of adults. She also holds a Master of Social Science degree. Her primary supervisor is Associate Professor Meg Smith of the School of Social Sciences: College of Arts. Her contact details appear below. This research project has been approved by the Human Research Ethics Committee of the University of Western Sydney as per the information included below.

The Research:

This research will investigate the outcomes of exploring the natural world using the arts. The researcher will meet with your child's educator over a period of nine months (between July 2008 to April 2009) to explore with them new techniques for working with children creatively that can assist them in understanding of the natural world through the arts. This will be integrated into the daily content of the preschool program and it is anticipated, be reflected in the children's play and their understandings of their environment. The research will investigate the extent to which the educators capacity to incorporate the natural world into their regular program has been enhanced and the educators perception about the extent to which the children's understanding of the natural world has been enhanced. There are two key research questions, each of which give rise to sub questions:

1. In what ways can self-generated creative arts experiences assist early childhood educators to support young children to learn about the environment?

- Does working through the arts assist the educators in incorporating information about the natural world into the program for the children?

- What effect does the research of flora, fauna and natural phenomena, and the development of creative experiences, that the early childhood educators will engage in, have on their understandings of or attitudes toward the environment?

- In what way does working through the arts to develop experiences about the natural world or the environment for the children, affect the educators' sense of connection with their local environment?

2. How do early childhood educators perceive the benefits for children of experiencing creatively presented material about the natural world as regular content in the early childhood program?

- Do the educators perceive any changes in the way in which the children express their understandings about the environment?

- Do the educators perceive any changes to the way in which the children behave toward the natural world or environment?

- Do the educators perceive any differences in the interactions between the children that can be attributed to the regular experiences of creatively presented information about the natural environment.

How will your child be involved?

Professional development for the carers/teachers

During a series of workshops with the researcher, the educators will explore specific techniques to assist them to include creative content about the natural world, particularly the natural flora and fauna in your local area, into their daily interactions with the children. They will in turn, develop and integrate into the children's program, additional stories, songs, verses and visual arts experiences that reflect this content. They will continue to formally observe the children and to monitor the extent to which this content is incorporated into their play and their understanding.

Data collection and analysis

While this project is essentially qualitative in nature there will also be a questionnaire schedule used. It will be applied three times over the course of the meetings with the educators to enable a comparison of their answers at different times throughout the study.

The educators will also be asked to keep a reflective diary with entries recorded weekly. The researcher will also keep a reflective diary to record her impressions of the focus groups and workshops, and the way in which participants shape the content of the workshops. This will assist them to track their thoughts and evaluations of the process between the monthly focus groups/workshops. Audio recordings of the monthly focus group discussions will also be made and conversational analysis will be used to code the transcriptions and to identify emergent themes in response to the research questions. The educators will be invited to

collaborate on the final frames or codes used to analyse the transcripts. The educators may also develop artefacts such as songs, stories and artworks that they would be willing to have included as data.

Data about the children is optional. The educators may choose to bring items to the focus group meetings to share that demonstrate the ways in which the children have responded to the program. This data will be collected using recognised methods of gaining and recording information about children in the early childhood sector. You will be able to access them according to the normal polices for accessing your child's records in the preschool. Methods for collecting data may include preschool educators discussing your child's current interests and their development with you, with their colleagues and with your child. They may also include observing and recording what your child does and says by writing anecdotes, diary entries, journal notes, writing running records and/or learning stories. They may include pictorial records such as photographic essays and audio/visual records and gathering the children's work samples. They may also include photographs that the children have taken of the environment. The teachers may collaborate with the children to determine which of their work samples/items they would like to include in their portfolios. This will help to determine the value and meaning that the children place on various aspects of the program. Your child's educator may choose to use the same methods for gathering data during this research process that they use in their everyday practice. They may also choose to add to the methods they use, where they do not use all of the above.

Benefits

Although the teachers may find initially that they are recording additional information about the children's and their own developing understandings, they will develop new techniques to enhance their program and their knowledge of the natural world, and their capacity for developing resources for use in every day activities with the children, that are based on the children and their environments. This may result in a time saving as resources to support the content of the program will be more readily available and the ongoing content of the program will become self-perpetuating.

The children will learn additional information about the natural world. They will learn about the dynamics of social relationships between animals, the habitats they frequent and require, and the flora in their local environment. They may also request additional stories from their teachers as they identify with the characters in them and see the qualities of them reflected in their environment.

Confidentiality, your child's participation and outcomes

You are free to withdraw your child's participation at any time during the course of this research. You will not be obliged to provide any explanation for your withdrawal.

All records of participants and the data they develop will be coded so that participants will not be able to be identified. Records will be kept secure in locked filing cabinets in the researchers home or in the office of her supervisor (all observations of your child and their work will be available to you throughout and at the end of the study).

At the completion of the research you will be informed of all findings. The researcher will provide the preschool with a copy of the completed paper. It is also anticipated that these findings will be published in refereed early childhood journals.

If you would like any further information about this study, please contact the researcher or her supervisor. The contact details are as follows:

Researcher: Kumara Tarr 0411 100 605

Supervisor: Associate Professor Meg Smith 0431072943

NOTE: This study has been approved by the University of Western Sydney Human Research Ethics Committee. The approval number is HREC H6188. If you have any complaints or reservations about the ethical conduct of this research, you may contact the Ethics Committee through the Research Ethics Officers (tel: 024736 0883 or 4736 0884). Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome.

Appendix 1.5 Parent consent form

Locked Bag 1797
Penrith South DC NSW 1797 Australia

College of Arts, School of Social Sciences
Associate Professor Meg Smith
Rm 1.1.13 Bankstown ph 61 2 9772 6299

University of Western Sydney
Bringing knowledge to life

Parent Consent Form for the Research Project:

Enhancing the Ways in Which Early Childhood Educators Scaffold Young Children's Learning About the Environment by Using Self-Generated Creative Arts Experiences as a Core Part of the Early Childhood Program

Dear Parent/Guardian,

Your child has been invited to participate indirectly in the above research project HREC H6188. The following is form is designed for you to indicate your consent for your child's participation.

The research will be conducted by Kumara Tarr: a Doctor of Philosophy candidate at the University of Western Sydney. She is a qualified early childhood teacher, primary school teacher and teacher of adults. She also holds a Master of Social Science degree. Her supervisor is Associate Professor Meg Smith of the School of Social Sciences: College of Arts. Her contact details appear below. This research project has been approved by the Human Research Ethics Committee of the University of Western Sydney as per the information included below.

Participation

Your child's participation in this project will involve them learning about the natural world through the program provided by their educators as described in the attached information sheet.

You are free to withdraw your child's participation at any time during the course of this research. You will not be obliged to provide any explanation for your withdrawal.

If you would like any further information about this study, please contact the researcher or her supervisor. The contact details are as follows:

Researcher: Kumara Tarr 0411 100 605

Supervisor: Associate Professor Meg Smith 0431072943

I hereby give permission for my child ……..to participate in the program presented by their carers during the course of the above research study:

Signed…….. Parent/Guardian

Dated…….

Appendix 1.6 Parent questionnaire

Locked Bag 1797
Penrith South DC NSW 1797 Australia

College of Arts, School of Social Sciences
Associate Professor Meg Smith
Rm 1.1.13 Bankstown ph 61 2 9772 6299

University of Western Sydney
Bringing knowledge to life

Optional questionnaire for families for the Research Project:

Enhancing the Ways in Which Early Childhood Educators Scaffold Young Children's Learning About the Environment by Using Self-Generated Creative Arts Experiences as a Core Part of the Early Childhood Program

1. What are your favourite memories of the natural environment as a child?

2. When you played outdoors as a child, what sort of environment/s or settings did you play in? (Please tick/or indicate percentages to all that apply)

Settings	% of play time spent in them
Back yard	
Local streets	
Local park	
With adults present	
Without adults present	
Pocket of urban wilderness	
Forest	
Farmland	
Beach/foreshore	
Other	

Comments:……

……

……

3. What, if any, were the outcomes of these experiences?

4. Do your children have access to similar play environments or experiences?

   a. Yes. No

   b. Please comment on the similarities or differences.

5. Where they are different, what are the main reasons for this? (Please tick all that apply)

   a. Safety concerns (no adults around)

   b. Risk of physical injury

   c. Access to similar environments

   d. Time to access them

   e. Other priorities for child's leisure time

Additional comments……

6. In what ways and how frequently do you and your family interact with the natural world now?

7. Why do you do this?

Thank you for your time.

NOTE: This study has been approved by the University of Western Sydney Human Research Ethics Committee. The approval number is HREC H6188. If you have any complaints or reservations about the ethical conduct of this research, you may contact the Ethics Committee through the Research Ethics Officers (tel: 024736 0883 or 4736 0884). Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome

Appendix 1.7 Licensee consent

Locked Bag 1797
Penrith South DC NSW 1797 Australia

College of Arts, School of Social Sciences
Associate Professor Meg Smith
Rm 1.1.13 Bankstown ph 61 2 9772 6299

University of Western Sydney
Bringing knowledge to life

Request for Permission to Conduct the Research Project:

Enhancing the Ways in Which Early Childhood Educators Scaffold Young Children's Learning About the Environment by Using Self-Generated Creative Arts Experiences as a Core Part of the Early Childhood Program

Dear Director/Licensee/Owner

I hereby request permission to conduct the research project 'Enhancing the Ways in Which Early Childhood Educators Scaffold Young Children's Learning About the Environment by Using Self-Generated Creative Arts Experiences as a Core Part of the Early Childhood Program' at your preschools and/or with your preschool educators. The research will be conducted in a manner consistent with the research proposal document, the information sheets and the consent forms for staff and parents attached. The research will be conducted between February 2009 and December 2009, inclusive. The University of Western Sydney's Human Research Ethics Committee has approved this research proposal. The approval number is HREC H6188. The preschools/educators that will be participating are:

Preschool	Educator

All records of the participants and the data they develop will be coded so that participants will not be able to be identified. Records will be kept secure in locked filing cabinets in the researchers home or in the office of her supervisor (copies of all observations of the children will be kept at the preschool as per the current policies for children's records).

At the completion of the research you will be informed of all findings. The researcher will provide you with a copy of the completed paper. It is also anticipated that these findings will be published in refereed early childhood journals. The preschools or research settings will not be identified unless identification is formally requested.

I hereby give my consent for the research project HREC H6188 as outlined above and through the attached information sheets and research proposal, to be conducted in the preschools and/or with the preschool educators specified.

Organisation:……Position…….

Signed……..

Name (please print)…… Date……

If you would like any further information about this study, please contact the researcher or her supervisor. The contact details are as follows:

Researcher: Kumara Tarr 0411 100 605

Supervisor: Associate Professor Meg Smith 0431072943

NOTE: This study has been approved by the University of Western Sydney Human Research Ethics Committee. The approval number is HREC H6188. If you have any complaints or reservations about the ethical conduct of this research, you may contact the Ethics Committee through the Research Ethics Officers (tel: 024736 0883 or 4736 0884). Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome.

Appendix 1.8 Reflective questions for feedback from educators

I discussed the mechanisms for feedback on the findings and analysis with all of the teacher educators on the phone. I asked if they and their colleagues would like to see the findings and analysis and invited them to provide me with feedback. I also asked if they did not provide feedback, whether I could assume they did not disagree with the content of the chapters provided. They all agreed that I could. The following email was sent to all of the preschools to elicit their feedback regarding the findings and analysis on 29 July 2010.

Subject: Chapters 5,6,7 and 8

Dear Colleagues,

By the end of today you will all have a copy of the DVD with chapters 5 Implementation, 6 Findings Educator and 7 Findings Children. I will write chapter 8 Interpretation and send it to you in the next couple of days. I have sent or delivered chapters 5,6 and 7 to you because they are files with many songs and movie clips in them and can not be emailed. You need to open these documents with **Acrobat Reader** so that the movie clips and songs work. I hope you will enjoy looking at these three chapters as they contain many really lovely images of the children and yourselves. The movie clips are between 10 seconds and about 2 minutes long. I would very much like your feedback on these chapters also. To assist in doing so the following questions may be useful.

- Is there anything (material, information) you feel should be added?
- Is there any material or images that you feel should not be included?
- Is there any material that you feel is inaccurate and should be modified?
- Do you have any confidentiality concerns given that the preschools have not been identified?
- Do you feel you and your preschool have been fairly represented?
- Are there any other comments you would like to make?

You could send your feedback via email or fax: 9836 4013. Thank you for your time in doing this. I do appreciate it. Hopefully I will be able to give you a copy of the finished document for your families and staff to view at the end of this year when the examiners have finished with it

Warm regards

Kumara Ward

kumara.ward@bigpond.com

This email was followed up with the text below informing the educators of the analysis chapters and seeking their feedback on them also. Chapter 8 analysis, as referred to above, was split into two chapters and became chapters 8 Educators and 9 Children. This email was sent on 5 August 2010.

Subject: Re: Chapters 8 and 9 interpretation

Dear Colleagues,

As promised, please find attached the interpretation chapters 8 and 9. Chapter 8 relates to the educators and 9 to the children. What I have said reflects what I think the findings mean. I would be happy to hear your interpretations if they are different (or even if they are the same) and to reflect them in the document. The questions below may be of use in structuring your comments and are the same at those I included in the most recent email.

- Is there anything (material, information) you feel should be added?
- Is there any material or images that you feel should not be included?
- Is there any material that you feel is inaccurate and should be modified?
- Do you have any confidentiality concerns given that the preschools have not been identified?
- Do you feel you and your preschool have been fairly represented?
- Are there any other comments you would like to make?

My time line is tight as there are a number of other people involved that I have to coordinate with. If you could provide any feedback you wish to have considered by next Friday 13 August, I would be most grateful.

Warm regards

Kumara Ward

kumara.ward@bigpond.com

Appendix 2 Month by Month Schedule of Data Collected

Table Appendix 2:1 Data Collected by Month

Month	Preschool 1	Preschool 2	Preschool 3	Preschool 4
January	• Consent forms for Children - Yes • Consent forms for educators - Yes • Educator surveys - Yes • Family surveys - No	• Consent forms for Children - Yes • Consent forms for educators - Yes • Educator surveys - Yes • Family surveys - Yes	• Consent forms for Children - Yes • Consent forms for educators - Yes • Educator surveys - Yes • Family surveys - No	• Consent forms for Children - Yes • Consent forms for educators - Yes • Educator surveys - Yes • Family surveys - No
February	• Video footage • Song • Planning notes for session • Written reflections	• Video footage • Verse • Educator Written observations and photos • Planning notes for session • Written reflections	• Video footage • Planning notes for session • Written reflections	• Video footage • Song • Educator Written observations and photos • Planning notes for session • Written reflections
March	• Video footage • Educator Written observations and photos • Planning notes for session • Written reflections	• Video footage • Photos of drawings/ paintings • Educator Written observations and photos • Planning notes for session • Written reflections	• Video footage • Voice memo • Still photos drawings • 1 song • Planning notes for session • Written reflections	• Video footage • Educator Written observations and photos • Planning notes for session • Written reflections
April	• No Visit • Educator Written observations and photos	• Video footage • Educator Written observations and photos • Hard copy drawings • Planning notes for session • Written reflections	• Video footage • 1 voice memo • Planning notes for session • Written reflections	• No Visit

May	• Video footage • Educator Written observations and photos • Children's paintings • 2 songs • Planning notes for session • Written reflections	• Video footage • Educator Written observations and photos • 2 Voice memos • 1 song • Still photos of children's painting and drawings • Planning notes for session • Written reflections	• Video footage • Planning notes for session • Written reflections	• Video footage • Planning notes for session • Written reflections
June	• Video footage • Educator Written observations and photos • 1 voice memo • Planning notes for session • Written reflections	• Video footage • Educator Written observations and photos • Hard copy drawings • 1 Song • 1 voice memo • Planning notes for session • Written reflections	• Video footage • Hard copy children's drawing • 1 Voice memo • Planning notes for session • Written reflections	• Video footage • Educator Written observations and photos • 1 Song • 1 Voice memo • Planning notes for session • Written reflections
July	• Video footage • Educator Written observations and photos • Hard copy children's drawing • Hard copy children's painting • Planning notes for session • Written reflections	• Video footage • Educator Written observations and photos • Voice memo • Planning notes for session • Written reflections	• Video footage • Planning notes for session • Written reflections	• Video footage • Educator Written observations and photos • I voice memo • Planning notes for session • Written reflections

August	• Video footage • Educator Written observations and photos • Hard copy child collage • 1 voice memo • Planning notes for session • Written reflections	• Video footage • Educator Written observations and photos • Hard copy children's paintings • Educator journal entries • Planning notes for session • Written reflections	• Video footage • Hard copy drawings • Planning notes for session • Written reflections	• Video footage • 1 song • 1 voice memo • Planning notes for session • Written reflections
September	• Video footage • Educator Written observations and photos • Still photos of children's drawings and paintings • Planning notes for session • Written reflections	• Video footage • Educator Written observations and photos • 1 voice memo • Planning notes for session • Written reflections	• Video footage • Planning notes for session • Written reflections	• Video footage • Educator Written observations and photos • 1 song • 1 voice memo • Hard copy children's drawings • Still photos of children's drawings • Planning notes for session • Written reflections
October	• Video footage • Educator Written observations and photos • Planning notes for session • Written reflections	• No Visit • Educator Written observations and photos	• Video footage • 1 Voice memo • Educator surveys • Planning notes for session • Written reflections	• No visit • Educator Written observations and photos

November	• Educator surveys • Video footage • Educator Written observations and photos • Planning notes for session • Written reflections	• No Visit	• Video footage • 2 voice memos • Planning notes for session • Written reflections	• Video footage • Educator Written observations and photos • 1 voice memo • Still photos children's drawings • Planning notes for session • Written reflections
December	• No visit	• Video footage • 1 voice memo • Planning notes for session • Written reflections	• Video footage • Wrap up talk hard copy notes • Hard copy children's collage/ paintings • Voice memo wrap up discussion • Planning notes for session	• No visit • Phone call –wrap up hard copy notes

Appendices 3 Songs and verses

Appendix 3.1 Croaka Loka

Croaka Loka, croak, croak
Croaka Loka, croak, croak
Was shiny green, croak, croak
Was shiny green, croak, croak.

Croaka Loka, croak, croak
Croaka Loka, croak, croak
Was shinny green, croak, croak
Was shinny green, croak, croak.

On forest leaves, croak, croak
On forest leaves, croak, croak
He's hard to see, croak, croak
He's hard to see, croak, croak.

Then he hops and and leaps to the ground
into the water without a sound
.....at all.
Repeat as required

Appendix 3.2 Cross Andrew

Chorus

Spinning, spinning half the night

To make a web with a cross of light

Spinning, spinning half the night

A fine web I will weave.

My silver web, it catches light

And flying insects of the night

And when I'm grown a cross you'll see

A fine web I will weave.

Chorus

But where to build my web so free

Beneath a roof or under a tree

I'll build up high and out of reach

A fine web I will weave.

Chorus

Appendix 3.3 Lester Lightfin

Chorus

Lester lightfin leather Jacket

Went swimming down Cabbage Tree creek

Swish swim, swish swim

Looking for food to eat

Swish swim, swish swim

Looking for food to eat.

Lester lightfin leather Jacket

Went looking for a place to call home

Swish swim, swish swim

A place to call his own

Swish swim, swish swim

A place to call his own.

Chorus

Lester lightfin leather Jacket

The other leather jackets said

Swish swim, swish swim

To Posidonia's sea grass bed

Swish swim, swish swim

To Posidonia's sea grass bed.

Appendix 3.4 Farmer Fiona

Chorus:

Farmer Fiona's rainbow field
Was ready for sunflower seeds
She ploughed and planted and tamped and fed
And made sure there were no weeds.

The sunflower shoots put down their roots
Into the soft warm soil
The pushed up their leaves, as green and the trees
Then rested fro m their toil.

Chorus:

They soaked in the sunshine and drank in the dew
Their stalks and leave grew strong
Their flower heads formed golden yellow and bright
And each day followed the sun.

Chorus:

Appendix 3.5 Cantareus Snail

Cantareus Snails had two pairs of tentacles
To sense the air around
She slithered so slowly upon her one foot
And hardly made a sound.

Cantareus snail lived in the garden
And nibbled on the moist bean leaves
She followed the caterpillar and moved to the flowers
And was as happy as can be.

Cantareus Snails had two pairs of tentacles
To sense the air around
She slithered so slowly upon her one foot
And hardly made a sound.

Appendix 3.6 Pappillio

Little Caterpillar tip-toeing
Across the leaves
Papillio, Pappillio, tip toe tip
Papillio, Pappillio, tip toe tip.

Walking to the leaf edge
He gets ready to eat
Pappillio, Pappillio
Munch, Munch, Munch
Pappillio, Pappillio
Munch, Munch, Munch.

With golden spinning silk
He makes a home among the leaves
Pappillio, Pappillio
Spin, spin, spin
Pappillio, Pappillio
Spin, spin, spin.

From green cocoon to butterfly wings
Curled under the sun
Pappillio, Pappillio
Fly, fly, fly
Pappillio, Pappillio
Fly, fly, fly.

Appendix 3.7 Silent Swamp Wallaby

On the rocky bones of the earth
The grass is course and rough
On soil covered turf
It's fresh and green and soft.

Wallaby hop, hop hop
Wallaby hop, hop hop
Wallaby hop, hop stop
The green grass here abounds
Wallaby hop, hop hop
Wallaby hop, hop hop
Wallaby hop, hop stop
The green grass here abounds.

Silent swamp wallaby
Alone and still he stands
In evenings when he feeds
In family groups he'll band.

Wallaby hop, hop hop
Wallaby hop, hop hop
Wallaby hop, hop stop
The green grass here abounds
Wallaby hop, hop hop
Wallaby hop, hop hop
Wallaby hop, hop stop
The green grass here abounds.

Appendix 3.8 Autumn Leaves

Red and orange and yellow and brown
Autumn leaves are falling down
Red and orange and yellow and brown
Falling softly to the ground.

Misty mornings in green, green glade
Frost near forming in the shade
Gentle breeze to stir the air
And falling leaves of autumn's hair.

Red and orange and yellow and brown
Autumn leaves are falling down
Red and orange and yellow and brown
Falling softly to the ground.

Appendix 3.9 Percy Pacific

Chorus

Percy Pacific lived near the pond
With his duck friend Georgina they sang a loud song
They dibbled and dabbled in the water to feed
On insects and molluscs and the fresh water weed.

With a dusty brown head and creamy down face
A dark brown stripe past the eye is traced
Dusty brown feathers edged in green
Three toes on t heir webbed feed to help in the streams.

Chorus

So friendly and peaceful are Percy and friends
The other ducks join them at rain's end
Molly Mallard, Grey duck and Chester Teal bright
Flock together to feed before they take flight.

After the rains, downy babies are born
With eyes open wide on their first dawn
They stay near the nest with their parents in sight
Walking and swimming until they can fly.

Chorus

Appendix 3.10 Hetty PJ Shark

Chorus

Hetty PJ Shark
Had very clever gills
She could just stop swimming
And stay completely still.

In rocky hills and caves
Dark, quiet and still
She waits and rests all day
Cause soon she'll eat her fill.

Chorus

At night she hunts and swims
Past seagrass, sand and kelp
Looking for crabs and lobster
On the continental shelf.

Chorus

Hetty PJ shark
Swims so far and wide
In winter she returns home
Her eggs cases to hide.

Chorus

With spirals from the sea
And points around the form
First soft, then hard when dried out
When babies have been born.

Chorus

Appendix 3.11 Swish, Swish Clown Fish

Chorus

Swish, swish clown fish

Swimming all around fish

Darting here and there

Swish, swish clown fish

Swimming all around

About my home I care

Swimming all around fish

Swimming all around

In the sea without a care.

Hide and seek

Then a very quick peek,

To see who is near my home

I'll listen out for sounds

Then a careful look around

From my anemone throne.

Chorus

With stripes white bright

When I take flight

In corals I can hide

With coral colour towers

Coloured so bright

I'll screen myself inside.

Chorus

Appendix 3.12 The Rainbow Song

Red and orange and yellow and green

Blue and Indigo and Violet

I can sing a Rainbow

Sing a Rainbow

Sing a Rainbow too.

Red and orange and yellow and green

Blue and Indigo and Violet

I can sing a Rainbow

Sing a Rainbow

Sing a Rainbow too.

Repeat as required

Appendix 3.13 Edmond Eel

Slinking sliding slippery eels

The water gives them a slippery feel

Under the water they make a nest

Dark and muddy is always best.

Appendix 3.14 Wilma Wombat

I'm big and slow I'm Wilma Wombat
Wandering through the bush
I never leave my warm, warm burrow
Without a little push
When I do it's oh so cold
And not a bite to eat
So I think I'll just go right home
Upon my tired feet.

I'm big and slow I'm Wilma Wombat
I've discovered something new
That all the wombats come outside
With the evening dew
They dig for roots and juicy shoots
Around the base of trees
Then wander home past earth and stone
To their burrows to sleep.

I'm big and slow I'm Wilma Wombat
Wandering through the bush
I never leave my warm, warm burrow
Without a little push
When I do it's oh so cold
And not a bite to eat
So I think I'll just go right home
Upon my tired feet.

Appendix 3.15 Pinky Pad Possum

Chorus

Pinky Pad Possum lived in a tree
With a tail a clever as clever can be
It helps her to climb, balance and swing
And poke her pink nose into everything.

In the fork of a gum tree she makes her home
And hardly spends any time alone
To her friends and family, she calls and growls
To make sure they are all around.

Chorus

In orchard and garden she searches food
Sneaks into the kitchen via the roof
Straight from the bowl the fruit she will eat
And scatter away on little clawed feet.

Chorus

Her babies are tiny and crawl to the pouch
Five months with a teat in a tiny mouth
Then its time to climb onto mothers soft back
To learn all the twist of the possum pad tracks.

Chorus

Appendix 3.16 Skylark the Scavenger

Chorus

Skylark the scavenger sits on the waves
He hasn't had a good meal for days and days
Then along comes a fishing boat cleaning out its net
So he swoops and dives
For all he can get.

Skylarks nest is shallow grasses, leaves and twigs
With his mate he comes home every night to the same place the live
He shares the nesting duties with his silver winged mate
But he comes home every night
He's never late.

Chorus

When three babies hatch they're covered in down
They have to be fed, they cannot fly around
Two black tipped feathers at six weeks old
They can fly on the air
Through the sunshine gold.

Chorus

He flies back to the nest where there's shellfish to eat
He'll nibble on your lunch, he's really got a cheek
With his bright red beak and the ring around his eye
He winks like a friend
Takes your sausage and flies.

Chorus

Appendix 3.17 Three Young Ducks

Chorus

Dibble Duck and Dabble Duck and Paddle Quack

Dibble Duck and Dabble Duck and Paddle Quack

Dibble Duck and Dabble Duck and Paddle Quack

Were three young ducks with downy backs.

Swimming in the water with a splash, splash, splash

Swimming in the water with a splash, splash, splash

Swimming in the water with a splash, splash, splash

Were three young ducks with downy backs.

Chorus

Pecking at their food with a quack, quack, quack

Pecking at their food with a quack, quack, quack

Pecking at their food with a quack, quack, quack

Were three young ducks with downy backs.

Chorus

Appendix 3.18 Deep Diver Dolphin

Deep Diver Dolphin

Loops through the waves

With all his friends he

Plays and plays

Deep Diver, Deep Diver.

Then up he leaps

In an air-bound curl

Then he dives to the depths

Of his watery world

Deep Diver, Deep Diver.

Deep Diver Dolphin

Loops through the waves

With all his friends he

Plays and plays

Deep Diver, Deep Diver.

Appendix 3.19 Jingle Jolly Jellyfish

Jingle Jolly Jellyfish, swish, swish swirl
Tingle tangle tentacles that loop and curl
Jingle Jolly Jellyfish, swish, swish swirl
Tingle tangle tentacles that loop and curl.

From petal clear polyps
On the ocean floor
Soon you'll be free in the waves to explore
Soon you'll be free in the waves to explore.

Jingle Jolly Jellyfish, swish, swish swirl
Tingle tangle tentacles that loop and curl
Jingle Jolly Jellyfish, swish, swish swirl
Tingle tangle tentacles that loop and curl.

Slowly, slowly
you change your form
Your tentacles grow ever more
Your tentacles grow ever more.

Jingle Jolly Jellyfish, swish, swish swirl
Tingle tangle tentacles that loop and curl
Jingle Jolly Jellyfish, swish, swish swirl
Tingle tangle tentacles that loop and curl.

Appendix 3.20 Slippery Sally Snake

Chorus

Slithering sliding slippery Sally Snake
Moved like ripples upon the lake
She's fast as lighting when catching food
But liquid and languid, in a dreamy mood.

Sally Python's colours are green and gold
Many stories about her size have been told
Long and slender with a big food lump
She coils up quietly under the sun.

Chorus

Still and quiet she sleeps all day
At night she wakes to hunt her prey
Night after night she is well fed
Until she grows so big, her skin will shed.

Chorus

Appendix 3.21 Spinning Spinning

Spinning spinning threads of light

To pass the day and warm the night

Spinning spinning threads of light

A home of love I'll weave.

My thread spins around and around and around

It keeps me warm and safe and sound

In my home, I curl up tight

And warm in all the gold spun light.

Spinning spinning threads of light

To pass the day and warm the night

Spinning spinning threads of light

A home of love I'll weave.

Appendix 3.22 Flicker Flutter

Chorus

Flicker Flutter gentle wings

Flicker Flutter hear them sing

Flicker Flutter gentle wings

Flicker Flutter hear them sing.

Awake inside my cocoon I know

Soon it will be time to go

I'm finished with spinning and weaving of light

Soon my wings will be ready for flight.

Chorus

Now my entrance hole I make

And my first steps I will take

My golden wings spread up to the light

Will take me joyously on sunbeams bright.

Chorus

Appendix 3.23 Charlie Case Moth

Charlie spins with sticks and silk

To make a home that's called a case

It's long and thin, soft and strong

Inside it there is plenty of space.

Charlie pokes out her head

And also three sets of legs

Behind her she drags her home

Where for two long years she lives alone.

Appendix 3.24 Percy Pig

On little trotters, Percy Pig

Went tottering around

Looking for tasty tidbits

On the muddy ground.

Sniffing here, sniffing there

A snouty funny sound

Oink, oink, oink, oink

Look what I have found.

Appendix 4 Educator survey responses Rounds 1 and 2

Table Appendix 4:1 Comparative responses to educator questionnaire

Educator survey questions	Coded Responses round 1	Coded Responses round 2
1. What, if any, are the benefits for children when they have a good understanding of the natural world?	It helps with: • Being interconnected. • Having a better understanding of home. • Being able to care for environment and respect the earth to ensure a better future. • Becoming good stewards. • Becoming inquisitive. • Enjoyment/love of nature and animals. • Being aware of all elements of the natural world around you.	It helps with: • Developing a sense of wonder. Contributing to growth in all developmental domains. Having sustainability ingrained. • Protection and awareness of, and care for the natural world. Observation skills creativity, and imagination. • Awareness of ones own interaction with the natural world and connection with it. • A sense of place and broader understanding of life. • A sense of connection with the environment and others combined. • A sense of confidence and wellbeing in daily life and an understanding of natural materials

2. What do children know if they have a good understanding of the natural world?	They: • Are more aware of their surroundings. • Understand interactions between people and the environment – e.g. where food is grown. • Know they can make a difference in caring for the natural world. • Know about sustainability and extinction and that they are stewards for the future. • Know about plants and animals and life cycles. • Use the knowledge as a basis for making informed decisions. Appreciate the value of living things. • Have a sense of wonder and fascination for how things grow. • They know not to destroy nature.	They: • Know about lifecycles and about animals, insects, plants, growing things, the seasons and recycling. • Have respect for all living things and an awareness of the impact of man's activity on the environment. • Have a sense of stewardship. • Have respect for others. • They know that without nature, children and our world would not exist: that it and our existence are linked together. • Respect and don't fear the natural world. • Know to nurture and preserve environments far and wide and how to look after the natural world. • Know how to express empathy for plants and animals. • Know about weather cycles and the difference between man-made and natural things. • Have a sound knowledge of their surroundings and of how the world works.

3. How do they (children) develop their understandings of the natural world?	Through: • Regular contact and experiences. • Working with natural materials. Adult examples, media, preschools, hands on activities, parents, teachers. • Sharing hypotheses with others and questioning/ investigating. Observation of and interactions with animals. • Sustainability practices. • Books. • A sense wonder fostered by adults. • Through play and self-discovery.	Through: • Being in it and observing nature. • Having unstructured play time and spaces. • Learning from educators who expand on their interests or scaffold learning as an every day part of the program. • Educators providing a wide range of natural materials. • Educators modelling respect for the natural world. • Home, the community and school. • Formal and informal learning including books, told stories, songs and music experiences and bringing outdoor aspects of it indoors. • Exploring and experimenting through gardening.

4. What role does/can the preschool environment and the programs they offer, play in enhancing children's understanding of the natural world?	They can: • Exposure children to the natural world. • Provide an intellectual level of understanding through books, games, having natural materials on display and discussing origins of natural items. • Provide hands on experiences, open ended matierials. • Educate staff to make interactions with the natural world part of the whole program. • Nurture children's interest by providing inviting natural play spaces. • Foster curiosity and sense of wonder through creating gardens, growing things and having animals to care for.	They can: • Use intentional teaching about the environment through story telling, drama and arts. Engage in sustainability as an everyday part of routines. • Provide opportunities for play in natural environments and natural materials for imaginative play. • Read and sing about the natural world. • Provide an environment filled with natural beauty. • Encourage curiosity and provide project work for exploration. • Integrate the natural world into all elements of the program so the children learn it is part of their world. • Create experiences which answer children's questions • Model respect for nature and develop children's thinking in a safe known environment. • Help children to understand the local environment.

5. What skills/ understanding does a child-care professional need to assist children to understand the natural world?	They need: • Genuine interest in and factual knowledge of the natural world • A good understanding of early childhood development. • Ability to communicate environmental issues in a fun and informative way. • To know where to go to find the answers together, research skills, and the ability to ask open ended questions. • Correct terminology. • Respect. • Understandings of sustainability. • Appreciation of nature.	They need: • Understanding and appreciation of and interest in the natural world. • Commitment to learning and teaching about the natural world. • Skills in developing lesson plans around children's interests in the natural world. • Understanding of types of creatures in local environment and how they help the ecosystem. • A love a gardening. • Empathy for the natural world and the ability to communicate this in way that captures the children's interests. • To be a role model. • Good research skills, access to google. • An open mind to creative ideas and an ability to follow the children's lead. • An awareness of how connection to the environment affect self awareness, self-esteem and confidence. • To ensure the children are not fearful of the environment. • …and have the confidence to seize the day (regarding positively oriented environmental activity)

6. How/where do *you* develop your understandings about the natural world?	From: • My own family and activities within it, experiences from childhood. • Being in it as an adult, gardening and bushwalking. • Media and by paying attention to the fear for the future message.	From: • Family or childhood experiences. • Adult immersion. • Media. • Hands on domestic practice. • Teachers, study, and professional development. • Internet. • Learning with the children.
7. What strategies do you currently incorporate into your program to assist children to learn about the natural world?	I: • Discuss topics as they arise. • Garden and observe creatures in the garden and spend time outdoors. • Display natural materials. • Read books and talk about nature. • Do projects of the natural world and discuss sustainability with children. • Encourage gentle-ness. • Provide unstructured play time outdoors. • Compost, worm farm, recycle, limit food packaging. • Respond positively to insects-animals in program space.	I: • Provide natural materials. • Garden, compost, worm farm and recycle. • Create natural play spaces with the children. • Engage is storytelling, art and craft experiences, modeling with clay, drama and music based on the environment and read books. • Expose the children to the natural world and research and explore the natural world with them. • Incorporate it into all parts of the program and link to creative experiences. • Model caring for animals. Go on excursions. • Encourage sustainable thinking through science experiments. • Enhance the children's sense of wonder through story, music and song.

8. What effect does this have on the children's understanding of the natural world?	It fosters: • Genuine interest and basic understanding. • Excitement and enthusiasm, makes it fun and memorable. Curiosity and understanding of us being part of the natural world. • Good stewardship • A sense of wonder. • A deep appreciation for living things.	It fosters: • Increased understandings. • Learning by example to produce less waste, care for animals, grow food and enjoy it, to compost and recycle. • An ability to feel the surroundings and develop more empathy and respect and have less fear for and about the natural world. • Interest passion for the environment and the ability to see more. • An understanding that we are intrinsically connected to the natural world and our actions affect it. • Knowledge that the environment is meaningful. • Questioning, hypothesizing and extends the ZPD. • Advocacy for the environment. • A sense of belonging to the natural world and confidence in who and what they are. • A feel that they are part of the solution.

9. What language/words/concepts do the children use when they talk about the natural world?	• Simple scientific words and concepts. It becomes more in depth during projects using life cycles and correct terminology. Bug, scary, yucky, hard, big, wet, growing. • Plants, animals, ocean, sky, how come, why. • Sustainability, recycling, environment, habitat, extinction, protected species, growing, waste.	• By educators modeling language such as lifecycles, seasons, recycling, reusing, good for our planet, solar panels, environmentally friendly, pests, rubbish and pollution. • Children use names of plants, vegetables, birds and insects. • Growing seeds, watersise, compost, mulch, soil, germination, growing, pollination, watering, camouflage and chrysalis. Descriptive language, correct terminology, conversational texts with factual information gained from scaffolded discussions. • Sun – [photosynthesis], trees.
10. When do they do this?	They do it: • With families, at preschool during activities and when relating experiences from home. • During projects and when observing the natural world with a responsive adult. • During interactions with the natural world such as when feeding animals, gardening, with peers and teachers. • During spontaneous learning situations, everyday after they have been here a while.	They do it: • With families, at preschool during activities and when relating experiences from home. • During projects and when observing the natural world with a responsive adult. • During interactions with the natural world such as when feeding animals, gardening, with peers and teachers. • During spontaneous learning situations, everyday after they have been here a while. • During morning tea, lunch and afternoon tea, during play and during yoga.

11. How is the local community and environment related to a child's understanding of the natural world?	It: • Provides small gardens, parks, that have snails, fruit bats at night, a variety of birds and butterflies. • Is relevant through all surroundings such as trees and local parks and swimming pools. • Can demonstrates consumerism or a more natural approach. • Represents the child's first area of exposure and has greatest impact. • Provides a role model through family involvement and by being able to interact with it. Can show the rural community's care of the environment providing a model of how the natural world should be. Can be a place where they see wild animals.	It: • Is relevant by way of the local national park, and familiarity with immediate bush environment. • Involves parents in teaching the children to eat healthy. • Builds connections between local community and preschool. • Is there for them to experience. • Teaches the children about the natural world and about utilizing water tanks, gardens and other sustainable practices. Fosters a love for it and appreciation of its beauty. • It teaches them that it is a big part of their home.

12. What role can the community and the local environment play in assisting a child to develop an understanding of the natural world?	It can: • Engage children in workshops, keep surroundings neat and tidy for them to take pride in. • Hold clean up, planting days and focus days. • Provide more national parks. Encourage recycling and values to protect and educate. • Engage in bush regeneration and provide opportunities to be in it. • Provide examples of living in a rich natural environment and promote good domestic sustainability practice.	It can: • Have wild spaces that are untouched for the children to experience. • Talk and teach sustainability. • Encourage children to spend time in it and to value it. • Encourage education in preschool to include the natural world as part of a social cultural approach. • Promote community drama. • Have clean up days. • Encourage the use of more natural resources. • Have petting farms and community gardens.
13. In what way, if any, is an understanding of the natural world important for children to develop as environmentally responsible citizens?	It fosters: • Appreciation of how much animals need nature. Stewardship and an understanding of our impact on planet. • The value of it. • Love. • Responsibility.	It fosters: • Development of a lifelong connection • Avoidance of apathy through disconnection. • A sense of place and natural stewardship. • Empathy and respect. • A sense of cohabitation. • An understanding we are part of it.