

Children and Young People's Experience of the Natural World: Teachers' Perceptions and Observations

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Abstract

This study explores the observations and perceptions of environmental education centre officers and teachers regarding children's experiences with nature. The study also explores the officers' and teachers' perceptions of the potential of using nature experiences in environmental education. A thematic analysis of data from interviews with 13 officers and 8 high school teachers in Sydney, Australia, revealed a widely held perception that children and young people have limited experience with natural settings in nature reserves and national parks. The interviewees suggested that although their students were interested in learning in natural settings, many were uncomfortable, afraid, and only had a vicarious understanding of Australian ecology, flora and fauna. The participants' view of the potential of nature experiences was twofold: nature experiences were fundamental for developing a connection with nature and establishing environmental concern, and experiences in nature facilitated ecological knowledge, which was considered to be a component of understanding and developing place identity in the Australian environment.

In the multifaceted field of environmental education, encounters with nature are often seen as important, as demonstrated by examples from early childhood education (Davis, 2010), primary and secondary school (Ballantyne & Packer, 2009; Martin, 2008; Sandell & Öhman, 2010) and higher education (Lugg, 2007; Stewart, 2008). In many parts of the world, including Australia, environmental education centres (EECs) offer teachers and students the opportunity to visit nature parks and other natural settings under the guidance of EEC personnel. This study focuses on 12 EECs in the Sydney region in New South Wales (NSW) that run environmental education programs that last from half a day to three days. This study explores EEC officers' and high school teachers' perceptions of children's experiences of the natural world and their view of the potential that nature experiences have for environmental education.

In the NSW Environmental Education Policy for Schools, one part of the definition of environmental education is that it is 'a lifelong multi-disciplinary approach to learning

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that helps people to understand and appreciate the environment and their connection to and impact on it' (Department of Education and Training, 2001, p. 7). Hungerford (2010) explains environmental education as 'an interdisciplinary effort aimed at helping learners gain the knowledge and skills that would allow them to understand the complex environmental issues facing society as well as the ability to deal effectively and responsibly with them' (p. 2). From an ecological perspective, Chapin et al. (2009) discuss ecosystem stewardship as an action-oriented framework intended to foster social-ecological sustainability. These authors argue that 'sustaining ecosystems services and livelihoods will require reconnecting people's perceptions, values, institutions, actions and governance systems to the dynamic of the biosphere through active ecosystem stewardship' (p. 248). Thus, understanding, skills, values and connections seem to be important aspects of environmental education. An assumption is that changes in individual knowledge, attitudes and connections will result in favourable behaviours towards our common world. However, the assumption that increased knowledge and more connections with nature automatically lead to behavioural changes has limited support in the research (Heimlich, 2010; Hungerford & Volk, 1990; Kollmus & Agyeman, 2002). Social and cultural factors seem to play a vital role in people's environmental behaviour.

Nature Experience and Environmental Education

A term used to describe the competencies that encompass knowledge and beliefs and/or philosophies about the environment is 'ecological literacy' (Cutter-Mackenzie & Smith, 2003; Orr, 2004). 'Environmental literacy' was coined in 1968, and it was reconceptualised and transformed into 'ecological literacy' by Orr (Cutter-Mackenzie & Smith, 2003). According to Cutter-Mackenzie and Smith, the object of Orr's theory of ecological literacy is to develop not a particular view of the environment, but a complex understanding of various philosophies that lead to ecological sustainability. A main concern for Orr and many other scholars in the field of environmental education is the need to recognise the value of experiences in the natural environment. Sandell and Öhman (2010) discuss the Swedish perspective by tracking the long tradition of direct encounters with nature in Sweden due largely to its tradition of public access to nature, as made available through common law. Given this context, the authors argue that in light of an increased pluralistic and political approach to environmental or sustainability education, there is the risk of neglecting nature encounters, which may limit children's opportunities to connect with nature. Aware of the lack of general causality between nature experiences and environmental concern, they argue for the potential of nature encounters. They emphasise the role that experiences in nature may play by adding a fourth perspective to sustainable development: 'this fourth dimension is not ecological, economic or social, but is rather a comprehensive existential perspective that originates from aesthetic and emotional relations with nature' (p. 125). From a place sensitive view, the authors argue that skills in 'reading the landscape' that concern both ecological and social aspects can be important complements to book-based knowledge.

Nature experiences and the ability to read the landscape are also emphasised from an Australian perspective. Brookes (2002) argued that outdoor education in Australia was too universal and decontextualised, and to have any influence on students' local ecological understanding, it needed to be better attuned to geographical, cultural and social aspects. This supposed lack of ecological literacy is supported by Zemits (2006), who found that tertiary students had limited knowledge of and connection to their local ecosystem. He argues that there is a need to promote a better understanding of local biodiversity and ecosystems from a conservational standpoint. Stewart (2006, 2011) and Stewart and Müller (2009) also argue for increased awareness of the importance of a natural history pedagogy from ecological and historical/social perspectives and stress

that nature experiences are important, but should be something beyond mere scientific learning. An argument for the importance of local ecological literacy is Australia's rapid loss of habitat and species extinction (Stewart, 2011). Stewart and Müller (2009) stress that the fact that the majority of Australian citizens are recent immigrants, having arrived within the past couple of generations, presents challenges relative to peoples' knowledge of Australia's natural history and how environmental education might be structured to improve understanding of the unique and diverse flora and fauna of Australia. They also suggest that 'observing, recognising, identifying and drawing connections between what is being observed and broader cultural understandings, can help a learner develop greater appreciation of socio-ecological or conservation issues associated with the place in which the observation are being undertaken' (p. 109). They support Zemits' (2006) results that identified many students' lack of ability to identify common local species. Another commentary on students' limited outdoor experience and knowledge from an American perspective is given by White (2009). Students' decreased knowledge of local biodiversity is also discussed from a Swedish perspective (Lisberg-Jensen, 2011).

Children's and Young People's Experience of and Connection to Nature

Today there is an ongoing debate about children's decreasing experience of and contact with nature (cf. Kahn, 1999; Kellert, 2002; Malone, 2007). There are not many longitudinal studies of children's experiences with nature; however, Malone (2007), Tranter and Malone (2008) and Burdette and Whitaker (2005, as cited in Ernst & Tornabene, 2012) suggest that children have decreased the amount of time they spend outdoors interacting with nature. Kellert (2002) suggests that nature experiences are important for children's development and discusses direct (e.g., spontaneous play in nature), indirect (e.g., zoos, EECs) and vicarious or symbolic (e.g., multimedia, books) modes of nature experience. He states that 'what may be new today is the extraordinary proliferation of vicarious images and unprecedented technologies for representing nature through the mass media' (p. 120).

There are a few studies exploring children's connection to nature. Ernst and Theimer (2010) revealed a strong connectedness to nature both before and after an environmental education program, but children's direct experience of nature was not a variable, and the relationship between experiences in nature and connectedness to it therefore remains unclear. As Ernst and Theimer (2010) discuss, connectedness to nature may be independent of nature experience given that children have limited experiences with nature.

As part of their aim to develop a 'connection to nature index' and measure children's connection to nature, Chen-Hsuan Cheng and Monroe (2010) found four factors associated with children's connection to nature. They were enjoyment of nature, empathy for creatures, sense of oneness, and sense of responsibility. Their results further revealed that children's connection to nature, their previous experience in nature, their perceived family value towards nature, and their perceived self-efficacy positively influenced their interest in performing environmental friendly behaviours. Students' knowledge about the environment and their experience with nature near their homes correlated with their connection to nature and indirectly influenced their interest in environmentally friendly practices. According to this study, there seems to be a relationship between nature experiences, connections to nature and environmental concerns. The authors discuss the correlation between connection to nature and nature near one's home. One explanation could be that access to nature develops a connection to nature. Another explanation is that living close to a natural area reflects the parents' attitudes towards nature, which, as the model revealed, was one factor associated with children's

attitudes toward nature. The important influence family has on environmental learning is also stressed by Payne (2005).

This study seeks to contribute to our understanding of how contemporary urban children experience nature by exploring EEC officers' and teachers' observations and perceptions of children's nature experiences. How the EEC officers and these teachers perceive the potential of nature experiences is another aim of the study. The study is framed by the following research questions:

1. What are the observations and perceptions of environmental education centre officers and high school teachers regarding how children experience nature?
2. What is the potential of nature experiences according to environmental education centre officers and high school teachers?

Research Design

Data Collection

Twenty-one semistructured interviews (duration 20–120 minutes, normally lasting 60 minutes) with Australian, Sydney-based science high school teachers and environmental education centre officers were conducted. The interviewees comprised 13 officers, including 6 men and 7 women, and 8 science high school teachers, including 4 men and 4 women.

All of the teachers were experienced science teachers in each year group (7 to 12). As fieldwork is a mandatory component of the New South Wales (NSW) curricula, working with EEC officers was part of teachers' learning and teaching repertoire. The schools and EECs were situated in different socioeconomic areas of Sydney. One EEC was situated within the city, while the others were located close to national parks or other natural environments.

The EEC officers had different vocational backgrounds, but were all experienced EEC officers. Examples of backgrounds include prior experience as primary or high school teachers in biology, history or environmental education, or a degree in geography or biology. One officer was interviewed at each centre, except on one occasion when two officers from the same centre were interviewed. The interviews took place at each respective EEC and school. Nine of the EECs in this study were run by the Department of Education and Training in NSW, and three were run by nongovernmental organisations. All were curriculum oriented and had programs that spanned from Kindergarten to Year 12. The programs were mostly run on a 1-day basis, but some ran for half a day and others for 2 or 3 days. The schools were both governmental and nongovernmental.

During the interview, two major areas were covered. One was the interviewees' experience of and reflections on using outdoor environments in teaching and learning and the benefits and challenges of outdoor teaching in the ethnically diverse setting of Sydney. Another area was the participants' perceptions of Sydney children's sense of belonging to nature, their 'sense of place', and the relationship between outdoor (environmental) education and the sense of belonging to nature.

Data Analysis

An inductive thematic analysis, which seeks to find themes or patterns in qualitative data (Braun & Clarke, 2006; Boyatzis, 1998), was used to analyse data in this study. According to Braun and Clarke, thematic analysis 'can be an essentialist or realist method, which reports experiences, meanings and the reality of participants, or it can be a constructionist method, which examines the ways in which events, realities, meanings, experiences and so on are the effects of a range of discourses operating within society' (2006, p. 81). As a researcher, I adhere to a realist rather than constructionist ontology,

but I do not view the researcher as someone capable of objectively describing reality. The researcher is a methodological tool (Cele, 2006) and thus a part of the analysis and results.

Thematic analysis can be data-driven or theory-driven (Braun & Clarke, 2006; Boyatzis, 1998). However, as Braun and Clarke state, regardless of approach, researchers 'cannot free themselves of their theoretical and epistemological commitments, and data are not coded in an epistemological vacuum' (p. 84). The process of analysing data, including reading and rereading transcripts parallel to reading literature, could be considered abductive (Bryant & Charmaz, 2007).

In the analysis, I followed the six phases suggested by Braun & Clarke (2006). In phase one, *familiarising*, the transcripts were first read through several times for familiarisation purposes. The second phase, *generating initial codes*, generated codes across the entire data set. Examples of codes were negative feelings, positive feelings, environmental concerns, talking about nature, talking about culture, challenges and the role of the school. In the third phase, *searching for themes*, the codes were further elaborated upon and linked to emerging themes. During phase four, *reviewing themes*, the codes, themes, and subthemes were reviewed (and were also reviewed by an independent researcher), resulting in a thematic map comprising five main themes. The themes and subthemes were mainly descriptive, but were also interpretative to some extent (Braun & Clarke, 2006; Miles & Huberman, 1994). In the fifth phase, *defining and naming themes*, the essence of each theme was refined and identified. Phase six, *producing the report*, was the final step of analysis in which selective conclusive extracts were embedded within the analytical narrative to produce a coherent and internally consistent account.

Validity

The first step was to send copies of the transcripts back to the participants for approval. The second step was to have four of the interview transcripts analysed by an independent researcher. Thereafter, interpretations and emerging themes were discussed and categorised by the author and the independent researcher.

Limitations

A limitation of this study is the lack of children's voices. However, by choosing environmental centre education officers, who meet a large number of children and students each year, I had hoped to achieve a broad overarching picture. To achieve a richer variation in answers, science high school teachers using the EECs as part of their teaching repertoire were also selected to give their view on the same topic. Children's experiences of nature vary and are dependent on a variety of factors. This study does not attempt to draw a general conclusion about children's experiences of non-urban nature in Sydney, but it will hopefully shed some light on how environmental education centre officers and high school teachers perceive urban children's experiences of nature and how they perceive the potential of nature experiences.

Results

Analysis of the interviews revealed three themes related to how children experienced nature. Those were 'feelings and attitudes', 'participation and familiarity', and 'knowledge and understanding'. Participants' perceptions of the potential of nature experience could be organised in two themes: 'connection and stewardship' and 'ecological knowledge as a component of Australian identity'.

Feelings and Attitudes

The participants often reported their observations and perceptions about children's feelings and attitudes while experiencing nature at an EEC or in another natural setting.

Interest and Engagement

Almost all of the teachers and EEC officers stated that their students appreciated environmental outdoor learning at the EECs. Students were described as engaged, excited, and interested:

When they come here they're just blown away and just are so excited and just so keen to learn everything about everything because they've just never been bushwalking and never been in this kind of environment and it's all new to them. (Michelle,¹ EEC)

On the one hand, the participants observed students as excited and interested in the outdoors, but on the other hand, they also observed them to be insecure and afraid.

Discomfort and Fear

Ten EEC officers and two high school teachers discussed the fear of Australian nature and animals as a challenge to outdoor environmental education:

Their whole idea of what the environment is about is alien and it doesn't just apply to the migrant kids. (...) probably the biggest challenge is letting the kids feel safe, safe and ... happy. (Robbie, EEC)

I get a lot of schools coming from central Sydney with whole groups of kids who've rarely been into the bush, who've rarely been into natural Australian environment (...) you see that some kids are fearful of it. (Nick, EEC)

Robbie and Nick emphasised students' fear of the iconic dangerous nature of Australia. Australia has many dangerous animals, such as poisonous spiders and snakes, and the hot, dry climate can also be hazardous, which was acknowledged by the participants. However, according to the EEC officers, regular bushwalking on tracks is not a particularly dangerous activity, and there is no need for the cautiousness and fear they often observed on school visits.

Participation and Familiarity

Although many of the participants found their students to be interested and engaged, only four participants explicitly described students as being familiar with the natural environment around Sydney. Sam, a teacher from a school close to Blue Mountains National Park, talked about inner city children's limited experience with nature in contrast to the experiences of his own students. Almost immediately afterwards, he also realised that even children who live close to nature might never actually encounter it:

Inner city students would go out to the bush, but they'd go to an area that I suppose is totally foreign to them (...) it's amazing how all these years sometimes the kids just have never been into the bush and even though you're only, you know, maybe 500 metres from the nearest house, you can see it. Some of them have never done anything like that. (Sam, teacher)

According to Sam, his students were not particularly ethnically diverse and were typically born in Australia. The teachers and EEC officers who worked in ethnically diverse areas strongly emphasised their migrant students' lack of experience with Australian

nature. All 13 EEC officers and 5 of the teachers discussed Australian-born and migrant students' lack of familiarity with nature.

The Role of the Family

Christine and many other participants acknowledged the importance of the family in introducing children to the natural world:

Unless you have a family that's very active in sort of outdoor learning, some children are only always exposed to an urban environment so unless they come to a field study centre, sometimes it's the first time the children have ever seen an environment like this. (Christine, EEC)

A few of the participants discussed a downward spiral effect; if the parents are not used to and comfortable in natural environments, it is not surprising that they do not expose their children to them. The parents transfer both a fear of spiders and snakes to their children and a general sense of detachment from nature, as in this excerpt from Alex:

A lot of kids come with a preconceived idea (...) we've had kids turn up and they said 'I'm not allowed to pick up any leaves off the ground 'cause mummy said they're dirty and I can't touch them'. (Alex, EEC)

Thus, children's attitudes toward nature are influenced by their families' attitudes, which sometimes contradict the aims and tasks of the EEC.

School-Based Outdoor Learning

The teachers considered visits to EECs highly valuable, but according to the participants, they did not occur frequently:

Each year group just has about one day a year that we take them out, occasionally two but usually one because it causes big disruptions with the school timetable and school program otherwise ... (Morgan, teacher)

According to teachers and EEC officers, school-based outdoor learning on school grounds or near the school did not occur frequently. Only a few of the teachers practised outdoor teaching without the support of the EECs. Safety issues, disciplinary issues, an inflexible curriculum and a lack of confidence were some of the factors that made teachers stay in the classroom:

When I talk to the teachers, they often find it difficult to ... or they're scared of working outdoors with their students. They worried about the fact that they're not confined, that they may not have the same sort of discipline (...) they don't know how to use their environment within their school ground. (Cynthia, EEC)

Teachers' limited environmental knowledge and confidence in teaching outdoors was a matter of concern to a few participants. John found migrant teachers to be particularly uncomfortable taking classes outdoors:

Well, of the science teachers, there's seven science teachers here, only two are born in Australia and probably ... it's probably only us two who've got the biological background and interest in Australian environment, to really know Australian plants and animals. (John, teacher)

More positive examples also featured in participants' narratives of school programs for restoring school grounds to attract native birds, frogs and butterflies:

They also need to realise that in an urban environment you can have space for the natural environment. In fact this is one of the things we're doing. What we're trying to do with the wildlife corridor [planted on the school grounds] is to show them that you can do this in your own backyard. (Simon, teacher)

Cate emphasised the role of the teacher in introducing students to natural environments. She talked about her work as a role model and did not think teaching in the classroom was sufficient:

If kids are going to schools five days a week, a lot of time they're not able to connect with the real world. So it teachers can do anything to get the kids outside and you know, seeing what the real world is all about and understanding it and not being afraid of it but instead loving it, then that's what I think all teachers should be doing, if we could encourage any teacher to do that. (Cate, EEC)

Her conclusion was that to be able to connect with and understand the world around them, students need to go outdoors more frequently.

Knowledge and Understanding

A concern for the participants was students' limited knowledge and understanding of Australian ecology, flora and fauna. Several participants stressed that children learn about nature from television and other media. Although they might be familiar with Australian animals from books and television, direct encounters might be a special occasion, as discussed by Nicole:

They are immersed with them [Australian animals] in our media, within books, but to have a one-on-one experience with them is still incredible for them. (Nicole, EEC)

Nicole and several other participants perceived that students tend to develop a global, noncontextualised and vicarious view of Australian nature. Nicole discussed the dangers of students' fragmentary knowledge of native fauna. Many lesser-known species are endangered without people knowing about it:

A lot of ours get lost. Forgotten about even if they're integral to their experience or the ecosystem that they live in. (Nicole, EEC)

Michelle talked about encounters with Australian children who believed that squirrels and woodpeckers, common in North American TV programs, also lived in the Australian bush. Although North American squirrels and woodpeckers do not live in the bush, introduced species, both plants and animals, are a major problem in Australia. Students' limited understanding of the uniqueness of Australian ecology and the challenges to this diversity were also emphasised by Simon and Kathleen:

I find Australian kids extremely ignorant of the natural environment and Australian plants and animals and of course students are coming here from overseas, well they they're probably used to seeing Indian Mynas, and common pigeons and sparrows and they come to Australia and nothing's different. (Simon, teacher)

When teaching biology I'm quite often surprised at how much they don't know about our native [wild] life, but I just take that for granted because I've grown up here. (Kathleen, teacher)

The participants reported that they were afraid that students' lack of outdoor nature experience could lead to a compartmentalised understanding of more than just ecological knowledge. Peter discussed how he found students to be distant from the natural world without understanding the connection between social and ecological systems.

I think kids of today are very well informed about environmental issues and are very conscious of it yet I think they have less understanding of the world around them. (...) The knowledge that we are all part of a system is missing today because of our way of living; we don't feel we have a sense of belonging to the natural world. The whole idea of separating the natural world from the manmade world is fundamentally wrong. (Peter, EEC)

Thus, according to the participants in this study, while students are mostly interested and engaged, they seemed to lack comprehensive ecological knowledge. As 40% of Sydney's population are born overseas (City of Sydney, 2010), many students are unfamiliar with the Australian natural environment. It is therefore not surprising that they lack any knowledge of Australian ecology. However, to be ecologically literate and to have an understanding about the nature and function of ecosystems is an important aspect of environmental education (DET, 2001; Cutter-Mackenzie & Smith, 2003).

In sum, the perceptions of the EEC officers and high school teachers in this study were that many Sydney children and students had limited opportunities to experience non-urban nature. Their view was that the visits to the EEC were often extraordinary events. According to the participants, the lack of experience with nature resulted in discomfort, fear and a vicarious understanding of the NSW natural context. However, the students were perceived as interested and engaged during outdoor environmental programs. The participants discussed two potentials that nature experiences might have for pedagogy, which will be presented in next section.

Potential of Nature Experiences

It may not be surprising that children in a big city do not frequently have non-urban nature experiences. School-initiated visits to EECs may play a role in helping students to experience and learn about the natural world. The participants mainly discussed two presumed outcomes of outdoor environmental education. These were emotional aspects, hopefully leading to place attachment, stewardship, and place identity from both a cultural and ecological point of view.

Connection and Stewardship

A major theme was the participants' concern that schools need to enable children to become familiar and connect with the natural environment. Almost all of the participants talked about the importance of emotional and sensory experiences in outdoor environmental education. They used expressions such as 'positive feelings', 'love', 'joy', 'engagement', and 'seeing the beauty' in their accounts of what they wanted their students to experience. By immersing children in the natural environment, the participants hoped to instil in them a love for nature. A connection to nature that helps to build a personal relationship with nature was seen as a first step. Interviewees hoped and believed that environmental concern would follow. Nine of the thirteen EEC officers and two of the eight high school teachers mentioned that theme:

By immersing the kids in these worlds they then know it, they care, have some sort of sense of belonging to it or attachment to it and maybe in future when they make a decision it will ... they'll have that in mind that you know my actions will affect the natural world. (Peter, EEC)

I think our job is not so much to hit the gloom and doom button, and to feel like you've got to do it, otherwise you're dead. It's got to be appreciating it, love it and by producing those sorts of values, hopefully values in the students, then that sort of action will take place naturally. (Robbie, EEC)

According to the participants, a major outcome of environmental education was that students need to learn to act responsibly and *want* to do so. To them, a love of nature and a sense of belonging were seen as important components in this process.

Ecological Knowledge as a Component of Australian Identity

Another theme was the perceived importance of ecological knowledge and the ways in which personal experiences with nature may facilitate migrant children's understanding of their new country and their sense of identity associated with it. This aspect was primarily discussed by high school teachers, as illustrated by the following excerpts from Veronica and Steven. Steven stressed the sense of recognition as a first important step to developing place identity and a sense of belonging:

So, when they can see it, they understand what people are talking about and you know like laughing like a kookaburra, when they see it and they can hear it and they can hear it laughing, they get it. And so, taking them outside and allowing them to see the different things that might hear people talk about or at least they know what is around them and that gives them a sense of belonging I suppose because they know what it is and they understand but also gives them power because they have a little bit more control now. (Steven, teacher)

Veronica emphasised the assumed relation between a sense of place and stewardship:

I think it's very important myself that they can associate our native flora with themselves and their experiences (...) again for their identity and their sense of place so that they feel responsible for it too. If they've got a strong sense of identity then they'll also feel that it's their response ... you know hopefully as they mature they will relate that to a part of them and they need to take care of the environment. (Veronica, teacher)

Steven described further how he tried to take his students on field trips, how he used school grounds and how he brought plants and illustrations into the classroom to help his students understand Australian biology and ecology. To him, outdoor learning played an important role because the students could smell, touch and visualise, which made it easier for them to learn and understand. He and a few other participants also used to ask recent migrant students to share their experiences from their home countries.

Visits to EECs and other out-of-school experiences gave students the opportunity to experience environments they may never have experienced otherwise. The participants talked about out-of-school experiences as a way to broaden their students' worldviews and sense of belonging. They also wanted students to realise that visiting those places was something they could do on their own, as illustrated by Alex:

So the concept of a national park being a place that they can come visit again, because they've enjoyed being here once and so therefore they might want to go back and do the same thing. (Alex, EEC)

According to the participants, EECs played a role in introducing students to the non-urban natural settings in which they hoped students would find value, care for and want to visit again. The participants acknowledged that a one-day visit to an EEC was

not enough exposure to allow these things to happen, but it might be a first step, 'a grain of sand that can become a beach', as one EEC officer put it.

Not surprisingly, the participants in this study saw the potential for outdoor environmental learning and found encounters with nature to be crucial in helping students develop knowledge and a sense of belonging to the natural world. They considered connectivity to be a critical first step towards developing environmental concern and responsibility. Recently arrived migrant children, in particular, were seen as needing support to approach and learn about their new country and its environment, but urban Australian-born students also lacked an understanding about the ecology and environment of Australia. Ecological knowledge was considered to be a component in understanding and developing a place identity in the Australian environment.

Discussion

Urban Children's Experience of Nature

The participants in this study believed that contemporary children have limited experience with the natural world and consequently are afraid of or uncomfortable in nature environments. However, the participants also frequently observed interested, excited and engaged students outdoors. A concern of the participants in this study was their perception of children's compartmentalised knowledge of the natural world due to limited experience. This concern is found worldwide (Lisberg-Jensen, 2011; Zemits, 2006; White, 2009). The relative importance of ecological knowledge can be questioned and discussed, but in the larger realm of ecological sustainability and ecological literacy, understanding of one's local ecosystem, flora and fauna could be an important component (Stewart, 2006, 2011; Stewart & Müller, 2009; Zemits, 2006). Stewart (2006, 2011) and Stewart and Müller, (2009) argue for a greater focus on natural history in environmental education as a means to promote ecological sustainability. They emphasise Australia's unique and rich biodiversity and the potential dangers of the urban population's lack of understanding and interest in the topic. Citing Bell (1997), Stewart (2006) argues that 'natural history is not just the accumulation of species names, but a holistic, embodied and situated approach to environmental education that fosters a connection between knowledge of one's surrounding and caring about the lives of the more-than-human world' (p. 91). The participants in this study seemed to share the view that described many Australian's limited knowledge and decontextualised understanding of their local native flora and fauna and the importance of such knowledge from an ecological literacy perspective. Many of the participants described children's understanding of nature as media-influenced, thus supporting Kellert's (2002) concern about limited direct nature experience giving way to the vicarious experience of nature.

The participants' perceptions of many children as uncomfortable in nature and ignorant about their local environment are worthy of attention. The family seems to play an important role in children's attitudes towards and contact with nature (Chen-Hsuan Cheng & Monroe, 2010; Payne, 2005), but many families are not interested in outdoor life or nature experiences. There is nothing indicating that this is a fundamental value, and people can certainly live well without these experiences. However, if we believe both that children should be given the opportunity to experience nature and that nature experiences are important components in ecological literacy, then outdoor environmental learning provided by the school is a valuable support system for many children.

However, the participant's views were that instances of school-based outdoor teaching were rare. If we want schools to provide children with nature experiences and ecological literacy, then outdoor teaching in natural settings should be a part of school practice that is used more frequently. If many children feel uncomfortable and afraid of the

outdoors, as reported by the participants in this study, then 1 or 2 days a year at an EEC is probably not long enough for them to learn to ‘feel safe and happy’ (quote from EEC officer). Children were not the only ones uncomfortable outdoors. Some participants’ perception was that many teachers did not have the confidence to take their students outdoors. Teacher training could better prepare teachers for outdoor instruction.

Connection to Nature and Environmental Concern

The participants in this study discussed place attachment, connectedness and place identity as dimensions of the overarching aims of outdoor environmental education. The perception of a link between experience, changed values/attitudes and environmental concern was strong among the participants. Kollmus and Agyeman (2002) and Heimlich (2010) conclude that there is not much consensus regarding how knowledge and attitudes might affect and predict environmental behaviour, and they argue for the limited usefulness of the ‘knowledge-attitude-behaviour’ model. In their analysis of barriers to environmental behaviour, Kollmus and Agyeman (2002) suggest that knowledge, values/attitudes and emotional involvement form a complex ‘pro-environmental consciousness’. This complex is then embedded in personal values, personality, social, and cultural factors, which together influence pro-environmental behaviour. According to Kollmus and Agyeman (2002), even if there is no straightforward relationship between knowledge, value/attitude and behaviour, knowledge, feelings and values/ attitudes all might have an influence on pro-environmental behaviour.

The EEC officers’ strong belief in the importance of joy and wonder in nature as a component connected to nature and environmental concern is supported by many scholars (Almeida & Cutter-Mackenzie, 2011; Chen-Hsuan Cheng & Monroe, 2010; Lugg, 2007; Orr, 2004; Preston, 2004). Thus, personal direct experiences with nature and enjoyment in nature seem to be important for establishing a connection and creating concern.

Ecological Knowledge as a Component of Place Identity

Ecological knowledge and understanding was discussed by the participants in this study as part of a sense of belonging to a society, or place identity in a country from a cultural point of view. Nordenström (2008) argues for a closer connection between multicultural and environmental education and stresses the importance of one’s feelings of connectedness with their community for the building of sustainable future societies. Her opinion is that a sense of belonging may be harder to achieve in multicultural societies. This can be related to the emphasis that participants in this study placed on the importance of knowledge and understanding of the natural environment in the ethnically diverse city of Sydney. They believed that outdoor environmental education was important for helping students to develop a sense of belonging in the natural environment. By developing ecological understanding, the participants thought it would also be easier to improve children’s identification with nature and culture. This view can be questioned and debated. In a study of outdoor recreation, Lisberg-Jensen and Oius (2008) found that the implicit norms and values of outdoor recreation that were used as means for extra-Scandinavian migrants to integrate into Swedish society were problematic. Nakagawa & Payne (2011) discuss the problems of belonging and the cultural construction of place identity in their study of international students’ experience of ‘the beach’ in Victoria. The experiences of the students were not similar to the initial perceptions of the iconic view of ‘the beach’. Their results suggested that the experience of snorkelling in Victoria might even be detrimental to the development of a sense of belonging. However, many scholars emphasise the relationship between nature encounters, ecological knowledge and a sense of place identity (Cohn, 2011; Sandell &

Öhman, 2010; Stewart, 2006; Stevenson, 2011). The relationship between place attachment and place identity is difficult to examine and is beyond the aims of this study. Both dimensions were discussed by the participants to demonstrate the potential of outdoor environmental education.

However, what can be discussed is whether the relatively short and infrequent experiences at EECs have any impact on children's connection to nature or place identity. The participants were committed to their work and wanted the children to have positive nature experiences, but given their observations of uncomfortable and scared children, it is unlikely that one day a year in the bush or in another natural setting is enough to evoke any long lasting place attachment and identity. Those children probably need more continuous outdoor environmental education to replace their feelings of fear and discomfort with feelings of attachment and identity. However, it must be noted that the teachers also reported their observations of interested and engaged children, and the rather frequent reports of fearful children might be due to recall bias; those children were probably more easily remembered. However, as the EEC officers meet a large number of students each year, the findings do tell us something about how urban children experience nature.

Conclusions

The main contribution of this study is a deeper understanding of how urban children experience nature, according to EEC officers and teachers. The participants in this study perceived many children as interested, excited and engaged in nature but many participants also witnessed children expressing discomfort and fear. The study confirms the concerns of other scholars and educators regarding children's compartmentalised and/or vicarious knowledge of Australian ecology, flora and fauna. Such knowledge was considered important from both an ecological literacy aspect and a place identity aspect. The results revealed the perception that outdoor learning in natural settings was rare and often limited to one annual visit to an EEC. If as many children are uncomfortable and afraid in nature as the results suggest, then they probably need more time to learn to feel safe and enjoy being in nature. Although environmental education centres play an important role in introducing children to nature, everyday school practice needs to also include nature encounters. As the family seems have an important influence on children's attitudes toward nature, EEC programs that reach the entire family would be valuable complements to school programs. Not all urban schools have easy access to nature, but many teachers could probably make better use of their nearby natural surroundings. However, teacher education need to prepare them for outdoor teaching because of its many barriers, as expressed by the participants in this study. Thus, the pedagogical implications of this study are that children should be given more opportunities to experience nature if the goals of ecological literacy, natural place attachment and identity are to be reached.

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Note

¹ All names are pseudonyms.

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