

Econnection in Early Childhood Education: Synergies in Inquiry Arts Pedagogies and Experiential Nature Education

Research Report 2017

Dr. Kumara Ward Western Sydney University



**WESTERN SYDNEY
UNIVERSITY**





“Through the combination of immersion in a nature scape, complex ecological concepts and an arts based exercise, a symbiosis of pedagogies has an opportunity to occur. Through the process of creative insight, a deeper visionary state can be induced, encouraging meditative and visionary opportunities, extending and deepening our scientific literacy and eco-vocabulary beyond that which is logical and language based.”

Visual Ecologist Aviva Reed:
(www.smallfriendsbooks.com)

This research was funded by the Western Sydney University: Women in Research Program
Ward, K. (2017) *Econnection in Early Childhood Education: Synergies in Inquiry Arts Pedagogies and Experiential Nature Education. Research Report.* Centre for Education Research. Western Sydney University.
ISBN (Print): 978-1-74108-461-0 | eISBN: 978-1-74108-462-7 | DOI 10.4225/35/5a39a42c85b42

CONTENTS

EXECUTIVE SUMMARY	1
Introduction	1
Methodology	2
Implementation	2
Findings	2
INTRODUCTION	4
AIMS	6
CONTEXT	7
Barriers to education for sustainability	7
Nature, creativity & the arts	8
Theories of the human/nature connection & econnection	9
Sustainability and health	10
Sustainability and social justice	10
Sustainability and education policy	11
METHOD - OVERVIEW	13
Stage 1:	13
Stage 2:	14
STAGE 1 ANALYSIS AND FINDINGS	15
PRINCIPLES	16
REFLECTIONS FOR ECONNECTION PEDAGOGIES	17
PRACTICES	18
STAGE 2 FINDINGS	19
Introduction:	19
Overall usefulness of the IAPENE pedagogical tool	20
Ways in which the pedagogical tool was used by educators	21
Growth and change in education for sustainability practices	22
Changes in Educators' personal engagement with the local natural environment	23
Children's learning about the local natural environment – place in education for sustainability	24
Linguistic expressions of place and the natural world – echoes of new understandings	24
Play in and around place – how children's play incorporated new understandings about the natural world	25
A naturally artful world – how children's artefacts reflected new understandings about the natural world and place	26
LIMITATIONS	27
Suggested improvements	27

OVERALL FINDINGS STAGES 1 AND 2 29

CONCLUSION.....31

REFERENCES.....33

APPENDIX 1: INTERVIEW SCHEDULE 37

APPENDIX 2: REFLECTIONS ON PHOTOGRAPHS 38

APPENDIX 3: FOCUS GROUP QUESTIONS 39



Wonder in the garden

IMAGES

Front cover. Nature art: Royal Botanic Gardens Sydney i

Inside front cover. Symbiogenesis workshop: Aviva Reed ii

Wonder in the garden: Tiaki Early Learning.....v

Respect for human and other than human relationships: Boulder Journey School..... vii

Street scape sustainability garden: Ontario Institute of Studies in Education: University of Toronto viii

Mosaic garden pathway made of local heritage crockery: Dimensions Preschool 1

Freedom to run in the forest: Niki Buchan Natural Learning..... 2

Creek ecosystem, visual ecology: Aviva Reed 2

Creative nature play on the beach: Niki Buchan Natural Learning 3

Early childhood classroom: Boulder Journey School..... 4

Symbiogenesis 5: Aviva Reed 5

Connecting to the natural world in preschool: WSUEL Hawkesbury 6

Nature art: Royal Botanic Gardens Sydney..... 6

Play on a hot day with water and soil: WSUWL Penrith..... 6

Outdoor marimba in the snow: Dimensions Preschool.....6

Symbiogenesis 4: Aviva Reed 9

Ephemeral artwork at the beach: Niki Buchan Natural Learning..... 12

Preservice teachers in the garden: Ontario Institute of Studies in Education: University of Toronto ...13

Inspired by nature composition: Ontario Institute of Studies in Education: University of Toronto 13

Sunflower and butterfly in preschool garden: Dimensions Preschool..... 13

Collaborative play with water: WSUEL Penrith 14

Rest time under the trees: Childspace Early Learning.....15

Creating patterns in nature: Cedarsong Forest Kindergarten.....16

Outdoor play in nature: Cedarsong Forest Kindergarten.....16

Child in the reeds: Tiaki Early Learning 17

Nature art: Royal Botanic Gardens Sydney..... 17

Ephemeral Art: Niki Buchan Natural Learning 19

Patterns and designs using natural elements: Niki Buchan Natural Learning 22

Preschool child watering the garden: WSUEL Parramatta.....23

Creativity workshop using natural elements: Niki Buchan Natural Learning 25

Art making in the garden: Dimensions Preschool.....27

Boulder Journey School infants room: Boulder Journey School.....28

Creative indoor play with natural elements: Boulder Journey School.....30-31

Pattern making in the forest: Cedarsong Forest Kindergarten 40



EXECUTIVE SUMMARY

Introduction

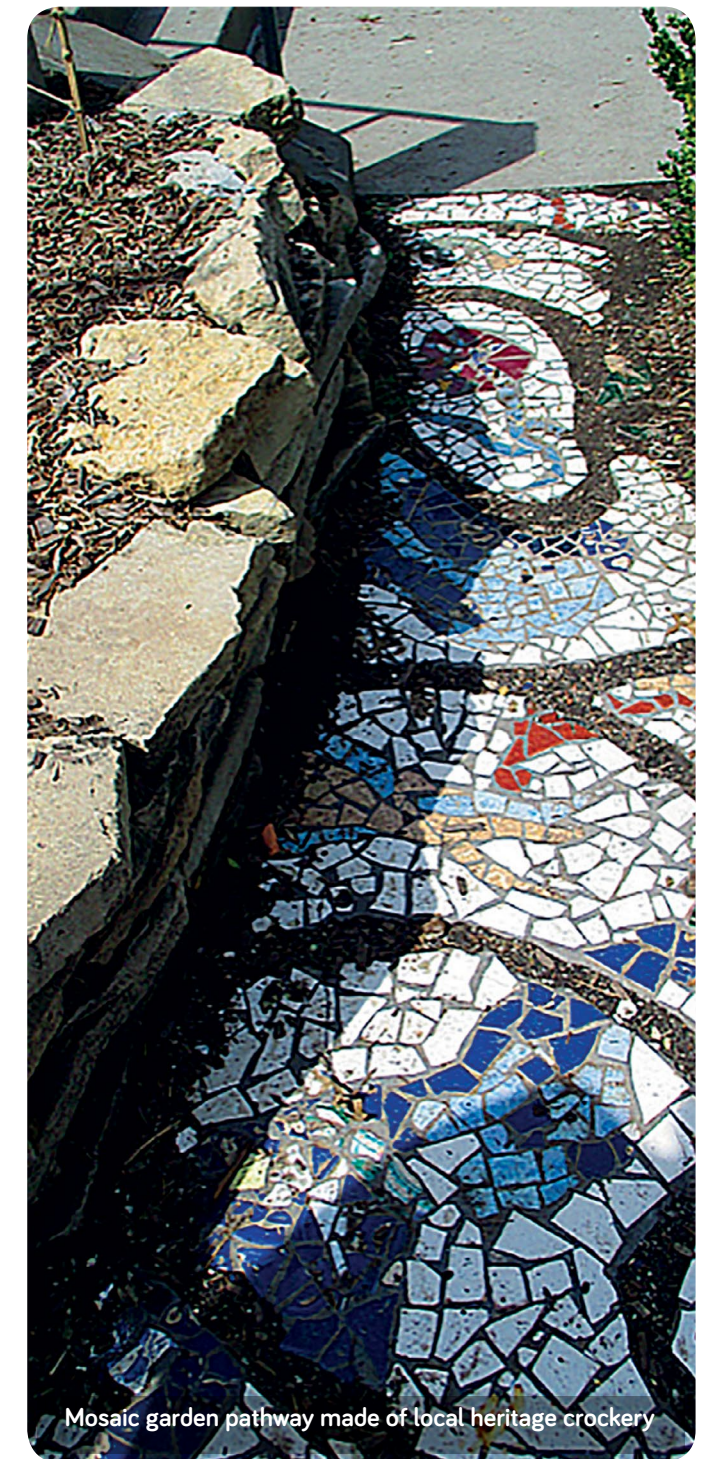
This report focuses on early childhood education for sustainability (ECEfS) which has become an increasing feature within the broader education for sustainability movement both in Australia and internationally. The introduction of bush kindergarten programs, forest schools, engagement in community greening projects and children's wild play gardens (Royal Botanic Gardens, 2017), as well as legislative requirements (Little, Elliot & Wyver, 2017a) are evidence of proliferation of activity in this field. Indeed, inclusion of sustainability education is a key tenet of *Belonging, Being and Becoming: The Early Years Learning Framework for Australia (EYLF)*: (Department of Employment Education and Workplace Relations, 2009) and an accreditation requirement of the National Quality Standard (NQS) for Early Childhood Education and Care and School Age Care (Australian Children's Education and Care Quality Authority [ACECQA], 2016). Standard 3.3 of the NQS focuses on care for the environment and sustainable futures. It is made up of Element 3.3.1: Sustainable practices are embedded in service operations, and Element 3.3.2: Children are supported to become environmentally responsible and show respect for the environment (ACECQA, 2016). Nationally, 15% and in NSW 21% of services are not meeting the standards for Quality Area 3 and more than 40% of services who require substantial improvement or who are working towards the National Quality Standard do not yet meet accreditation standards for Quality Area 3 (ACECQA, 2017).

This research engaged early childhood educators in processes for integrating sustainability education with arts-based curriculum and pedagogies to facilitate an increase in content related to the natural world and to normalise this content with a focus on place. The arts are a standard inclusion in the early childhood program. Turning to the arts as a multimodal form of investigation and perception (Eisner, 2002; Judson & Egan, 2012) facilitated a focus on the natural world as content and highlighted the local environments of the participating children's home settings and early childhood settings.

N.B. Additional note on terminology:

The early childhood services across the five countries represented in this document use a variety of terms for early childhood centres/preschools/nursery programs and kindergartens. The term *early childhood setting* is used here to describe these services. There are also many terms

used to depict the natural world including environment, bush, forest, woods, green space or place. The term *outdoor learning space* has been used here to encompass outdoor classrooms, play grounds or gardens in early childhood settings, and the natural world or green space or place to refer to wilder bush, forest or woods.



Mosaic garden pathway made of local heritage crockery



Street scape sustainability garden

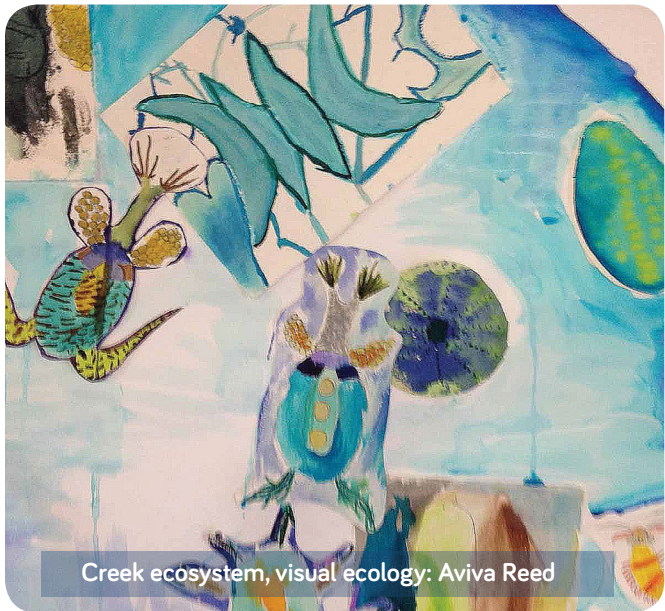
Methodology

An interpretivist, inductive approach underpins this research, with the qualitative methodology in Stage 1 including mixed methods such as open response interviews (Gray, 2014), photo-elicitation and photo-stories (Bignante, 2010; Wang, 2008). Analysis focused on searching for patterns of similarity and difference to identify common themes (Clark, 2011). Reliability was conferred through the number of participants in the initial stage (30) (Gray, 2014) and the mixed methods employed (Creswell, 2007). Stage 1 resulted in the development of a series of Principles, Reflections for Econnection Pedagogy and Practices (see pages 19-25) in what is now the *Inquiry Arts Pedagogy and Experiential Nature Education (IAPENE) Handbook* (Ward, 2017a), hereafter referred to as the *IAPENE Handbook*.

Stage 2 trialled the use of the *IAPENE Handbook* and involved inductively oriented practitioner action research (Groundwater-Smith, 2008; Ponte, Ax, Beijgaard & Wubbels, 2004). The findings and analysis focused on the correlations between the applied Principles, Reflections and Practices indicated in the handbook and the outcomes when educators in early childhood settings in Sydney, Australia and Lincoln, USA engaged with them.

Implementation

Stage 1 of this research asked the following questions: What do international perspectives on outdoor experiential learning incorporating arts based pedagogies teach us about learning affordances for young children?; and, how is this relevant to the requirements of the EYLF and NQS for embedding education for sustainability in Australian early childhood settings?



Stage 1 of the IAPENE research resulted in the development of a pedagogical tool for use in early childhood settings. This tool consolidated the notion of *econnection*: a state of artful, deep ecological and cultural connection to, and engagement with, the natural world.



Stage 2 of the research project asked: To what extent are the Principles, Reflections for Econnection Pedagogies and Practices in the *IAPENE Handbook* useful for incorporating additional content about the natural world and how did educators use them?

Stage 2 trialled the *IAPENE Handbook* at all six Western Sydney University Early Learning Centres and at one early childhood setting in Lincoln, Nebraska, USA. Given the high number of services in Australia that are not meeting the accreditation requirements related to embedding sustainability into the early childhood program, and the challenges for incorporating sustainability education in early childhood in the USA, the need for additional tools to address the issue and the scope for national and international impact of this tool is substantial.

Findings

1. There are strong synergies between the perspectives of sustainability educators and academics, artists, outdoor educators and early childhood educators with regard to the value, impact and importance of the natural world and the extent to which the arts can play a key role in accessing, understanding, interpreting and expressing *econnection* with the natural world.
2. The arts provide a useful means of interpreting the natural world and making content about the natural

world more accessible for inclusion in curriculum in early childhood.

3. Interpretation of the natural world through the arts, when included in early childhood curriculum, enhances children's and educators' awareness of the local and regional natural environment.
4. Engaging with the Principles, Reflections for Econnection Pedagogies, and Practices included in the *IAPENE Handbook* results in a substantial increase in awareness and knowledge of the local natural environment for both children and educators.
5. Practice suggestions in the *IAPENE Handbook* are immediately relatable to existing pedagogies in the educators' repertoires.

6. Educators working with the *IAPENE Handbook* reported that sense of place and belonging were positively effected for both educators and the children with whom they worked.
7. Educators and children incorporating the *IAPENE Handbook* Principles, Reflections and Practices expressed new understandings about the human/nature connection and interdependence.
8. Educators working with the *IAPENE Handbook* reported that cognitive problem solving and imagination were a focus for the children when engaging with natural phenomena and materials during their play and investigations.



INTRODUCTION

Sustainability education or Early Childhood Education for Sustainability (ECEfS) is a required element of the early childhood curriculum (Australian Children's Education and Care Quality Authority (ACECQA), 2016; DEEWR, 2009). Quality Area 3.3 requires that 'The service takes an active role in caring for its environment and contributes to a sustainable future' (p. 10). Standard 3.3.1 requires services to embed sustainable practice into service operations and 3.3.2 to support children to become environmentally responsible and show respect for the environment.

While these standards are legislated, many early childhood educators express a concern that sustainability is something extra that they have to fit into an already crowded curriculum. They often find it difficult to balance this need with the ideological or political barriers and perceived risks associated with a focus on sustainability (Elliot & Davis, 2009; Knight, 2011), and in particular with experiential outdoor education, which is a key pedagogical approach for engaging in sustainability education. These actual and perceived barriers are reflected in the latest National Quality Framework (NQF) snapshot report (ACECQA, 2017) of children's services in Australia which shows that more than 40%

of services that require substantial improvement or are working towards the National Quality Standard, do not yet meet accreditation standards for Quality Standard 3.3, specifically elements 3.3.1 and 3.3.2. In addition, 15% of services Australia wide and 21% in NSW are not meeting the standards required for Quality Area 3 (ACECQA, 2017).

The legislative requirements for ECEfS in all areas of Australian curriculum reflect societal values and the political imperative of sustainability awareness in current times. Responding to societal values and meeting the legislative requirements requires multiple approaches across all sectors of society. Indeed, the term 'Anthropocene' has gained currency in referring to the contemporary era (Crutzen & Ramanathan, 2000) and denotes that the many ecosystems that make up our planet are being dramatically altered by human activity. The current climate change crisis is testament to this term's validity for describing the current time interval in which we live. Eco-justice and sustainable communities are a focus at civic, state and national government levels, and in educational institutions across all sectors.



Early childhood studio,
Boulder Journey School

In recent years, the Australian Council of Environmental Deans and Directors (ACEDD) has endorsed the *Learning and Teaching Academic Standards Statement for Environment and Sustainability*. This endorsement provides a strong imperative for higher education institutions to integrate sustainability into teacher education and other academic programs (Phelan et al., 2015). The inclusion of this content for pre-service teachers will help to reinforce the understanding that young children, as part of society, have a right to understand and know their environment and to interact with it in multiple ways. This is important for their role in the community now as children, and also for their role as future citizens. Educational standards, such as those endorsed by ACEDD, seek to redefine sustainability as an emergent practice that is integrated into all facets of life.

The key purpose of this research was to develop and validate new methods for integrating ECEfS into early childhood settings by way of curriculum integration with inquiry arts pedagogies. Inquiry arts pedagogies engage educators and children in investigation and problem solving through the arts (Eisner, 2002; Judson & Egan, 2012), and in interpretation, representation and meaning making (McArdle, 2012; Wright, 2012). Early childhood educators are in a unique position to assist young children to deepen their connection to their place and their natural environment, and to engage in sustainable interactions with the natural world. These are important steps in nurturing the growth of responsible stewards who can participate in guiding humanity through a process of sustainable cohabitation with the earth (Chawla & Flanders Cushing, 2007).

Moreover, the lack of focus on ECEfS and the natural world in many educators' own child-centric urban-based educations has meant that educators have been underprepared by their pre-service training for developing the pedagogical tools and practices for sustainability that are now required of them under the National Quality Standard (ACECQA, 2016). This lack of focus makes the need for a pedagogical tool such as the *IAPENE Handbook* developed as part of this research all the more important.

Elliot and Davis (2009) sum up the need to find new ways of engaging with sustainability through education most succinctly.

The long-term health and survival of human populations and the health of global natural systems are closely entwined. The need for fundamental changes in how we live has become impossible to ignore. Education has a key role and all sectors – including early childhood education – must be a part of re-imagining and transforming current unsustainable patterns of living. p. 66.

The educators participating in this research, while in the minority with regard to sustainability practices, are the champions of their organisations. They demonstrate an ongoing commitment to sustainability and mentor, promote and engage in sustainable practices in their early childhood settings.

This research focused on developing a new model for integrating arts-based pedagogies and experiential nature education so that ECEfS becomes a natural part of the curriculum for all educators.



Symbiogenesis 5: Aviva Reed

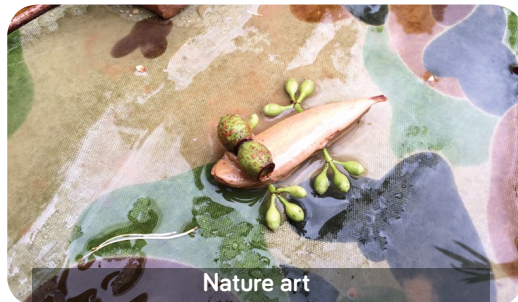
AIMS

The aims of the research were:



Connecting to the natural world in preschool

To correlate the perspectives of an international group of educators, who work with sustainability education and the arts, to identify the synergies between the respective curriculum content and pedagogies, and the enhanced learning possibilities afforded by combining these curriculum content areas.



Nature art

To analyse the synergies between sustainability education and the arts through contemporary post humanist approaches in a manner that responds to an emerging current in the field to engage with post humanist theorising in education, particularly in relation to human interactions and relationships with the natural world.



Play on a hot day with water and soil

To develop a series of recommendations regarding sustainability education relevant to the early childhood education sector that supports the implementation of relevant and accessible ECEfS and overcomes many of the current barriers with regard to sustainability education for this age group.



Outdoor marimba in the snow

To engage in a pilot program in Sydney, Australia and Lincoln, Nebraska, USA to validate recommendations arising from the analysis of the international perspectives.

“There are strong synergies between the perspectives of sustainability educators and academics, artists, outdoor educators and early childhood educators with regard to the value, impact and importance of the natural world and the extent to which the arts can play a key role in accessing, understanding, interpreting and expressing econnection with the natural world.”

CONTEXT

Previously held beliefs about the development of environmental connection, awareness, or stewardship occurring by chance or through single learning modalities are changing. As Hungerford and Volk (cited in Chawla & Flanders Cushing, 2007, p. 437) argue “environmental educators typically assume that if they impart knowledge to students, responsible action will follow. Research, however, indicates that the antecedents of action are much more complex than knowledge alone.”

There have been many studies about the development of environmental stewardship or sustainability dispositions. Chawla and Flanders Cushing (2007) review multiple large and smaller scale research projects conducted with participants who are active in environmental advocacy in one form or other and who indicate that early childhood engagement with the natural environment is a significant part of forming sustainability dispositions. In these studies, from half to more than 80% of the respondents identify childhood experiences of nature, such as free play, hiking, camping, fishing and berry picking as significant experiences. They mention influential family members or other role models equally as often or next in the hierarchy of importance. As one would expect, environmental educators often attribute their vocation to influential teachers and education. As Chawla and Flanders Cushing (2007) note:

These findings suggest that nature activities in childhood and youth, as well as examples of parents, teachers and other role models who show an interest in nature, are key ‘entry-level variables’ that predispose people to take an interest in nature themselves and later work for its protection.” (p. 440)

Another common belief is that children simply need to be exposed to, or to spend time playing in, the natural world in order to develop environmental understandings or inclinations for further engagement later in life. Elliot and Davis (2009) discuss the limitations of this idea with regard to young children and play environments, warning that such thinking runs the risk of missing opportunities for utilising outdoor play and play spaces to full effect (p. 70). They note instead that in the creative processes of planning outdoor play and play spaces “underlying themes of sustainability abound” (p. 70). They echo Chawla and Flanders Cushing (2007) in asserting there “is an erroneously narrow view of EfS as being simply about the acquisition of knowledge about environmental topics” (Elliot & Davis, 2009, p. 71) and further contend

that such a narrow focus prevents the acknowledgment of primary engagement with the environment and the scope this experience contains for collaboration, problem solving and creativity as modes of knowledge and learning.

Cutter McKenzie and Edwards (2006) also echo this sentiment, highlighting the need for educators to engage in intentional discovery and exploration with children in a manner that scaffolds learning. Thus, it is the outdoor play combined with creative processes that enable the foregrounding of sustainability dispositions.

The work of Chawla and Flanders Cushing supported by Elliot and Davis highlight the limitations of a predominately conceptual knowledge approach, that if relied upon, would entirely miss the other ways of knowing through embodiment and creative engagement. Rautio, Somerville and Hultman & Lenz Taguchi, (2013; 2011; 2010), as well as Malone, Wilson and Sandrine (2018; 2010; 2006), all refer to engagement with the natural world through new materialist perspectives, post humanist lenses, creative postmodern emergence approaches and recognition of the power of the affective – in Wilson’s case – the sense of wonder. These topics are addressed further on in this report.

These multiple forms of engagement, interaction and recreation of experiences in nature through creative experiences, support the underlying premise of this research: when children engage in regular creative interpretations and recreations of experiences in the natural world, through a variety of arts modalities, scaffolded by influential and knowledgeable adults, they develop an artful and integrated metacognition of the qualities of the natural world. This metacognition supports an increased understanding of local natural environments, a sense of belonging as part of the landscape and a heightened sense of the reciprocal support structures involved in living on the earth (Ward, 2017b).

Barriers to education for sustainability

There are a number of barriers to education for sustainability, including lack of institutional and political support, concerns about safety, and assumptions that environmental education and sustainability are too complex for young children

Elliot and Davis (2009) note that “Australia’s only national review of early childhood environmental education (the New South Wales Environmental

Protection Agency’s 2003 report ‘Patches of Green’)” found that much of the work on early childhood and ECEfS was driven by individuals (or individual settings or organisations) “that shared a passion and commitment to the importance of early childhood environmental education” and that their efforts are largely unsupported by political and private structures, and are unacknowledged in their own field (p. 69). They note:

...in Western countries, there are perceptions that ‘real learning’ takes place indoors. There are concerns about safety outdoors and flow-on litigation and new learning technologies offer attractive alternatives that militate against experiential learning in natural outdoor playspaces (Furedi, 2001; Gill, 2007; Louv, 2005; Malone, 2008; Palmer, 2006). (p. 70)

These tensions between learning modalities and safety are particularly relevant for early childhood educators who, according to Elliot and Davis (2009), face numerous challenges. These include: perceptions that sustainability education is not required as the children in their settings live in Australia, the land of outdoor engagement and play, where these sensibilities will naturally develop; and the perception that young children cannot grasp the complexities of education for sustainability.

The absence of research and discourse related to the natural world and early childhood education, and accessible ways of characterising the complex relationships inherent within it, are also an issue for educators according to Elliot and Davis (2009). The predominance of post-structural influence on early childhood education and sustainability in the last two decades has led to an anthropocentric worldview that entails blindspots, including the conception that “Nature is invisible, does not have a voice, and does not provide a text for deconstruction of power relations between humans and nature” (Elliot & Davis, 2009, p. 72).

Another significant barrier reported is the concerns about children’s safety and the risks inherent in outdoor play in unstructured spaces. Engaging in primary experiences in the natural world, a key element of sustainability pedagogy, is seen as presenting too great a risk (Wyver et al., 2010). While outdoor play has been a feature of early childhood education settings for much of the last century, the focus was on engagement with the natural world as a means of

developing character and conceptually understanding the world. Furthermore, contemporary legislative requirements have been interpreted with a strong emphasis on risk and have been applied to ever decreasing outdoor spaces, including indoor spaces in commercial buildings with outdoor activities, such as climbing apparatus, available in them (Little, Elliot & Wyver, 2017a). This over engagement with risk aversion is succinctly summed up by Duhn who paraphrases Osgood, (2006 p.20) when she states that “early childhood centres and kindergartens are often prime sites where the discourses of protection, vulnerability and innocence create a highly controlled and closely monitored environment through policy, pedagogy and daily practices.”

Such practices generate a panoptic surveillance approach on the part of educators that limits the scope of children’s outdoor exploration and interrupts educators’ free engagement with children and their play.

Nature, creativity & the arts

Questions about the relationship between art, the natural world, and the human have a long history. Notably, Immanuel Kant and Georg Wilhelm Freidrich Hegel took them up through the lens of aesthetics in an apparently oppositional manner. Fortunately for us, we do not have to enter their debate in an either-or fashion, but may find benefit in drawing on some aspects of their thought that resonate with contemporary thinking on the importance of creativity and the natural world. Indeed, Eisner (2002) uses specifically Kantian language when discussing the challenges faced by children of today: “The world that students now live in and that they will enter as adults is riddled with ambiguities, uncertainties, the need to exercise judgment in the absence of rule, and the press of the feelingful as a source of information for making choices” (xii). This exercising of judgment in the absence of rule, and the identification of feeling as a source of knowledge (which is what judgment in the absence of rule, or reflective and aesthetic judgments allow for) is central to Kant’s *Critique of Judgment*.

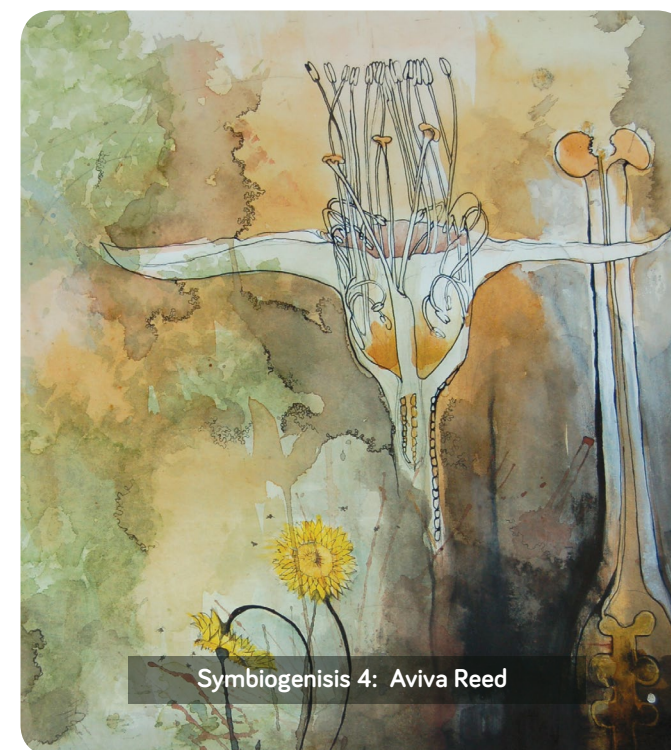
The arts help us to consolidate understandings, allowing for recreation of impressions of primary experience, bringing them to life and inscribing them further on our consciousness (Eisner, 2002). Our attempts to represent these experiences, and convey meanings in doing so, engage us in a process of integrating memory, stored

sensory impressions, affective feelings and cognitive understandings. The arts enable us to speak back to our ideas, enabling us to engage in a dialogue and to see what we have previously said (Eisner, 2012, p.10). This multi-faceted engagement makes the arts a most powerful vehicle for noticing the world around us, investigating, interpreting and representing the natural world and understanding its complexities.

Eisner explains that the increasing recognition of the importance of the arts in academic performance has not served to change their overall standing as “nice but not necessary” (2002, xi-xii). Highlighting the role of the aesthetic in the arts in complex thinking he says:

not all works of art are created equal. ... I want to acknowledge that any practice whatsoever can have aesthetic or artistic qualities. This includes three-year-olds building castles in the sand as well as surgeons engaged in a life-sustaining operation. What is aesthetic depends at least in part on the way some feature of the phenomenal world is addressed.” (xiii-xiv)

Visual ecologist, Aviva Reed, highlights the complexities and the deep learning that is possible on a personal level when combining arts pedagogies with immersion in natural landscapes and conceptual understanding.



Symbiogenesis 4: Aviva Reed

Through the combination of immersion in a nature scape, complex ecological concepts and an arts based exercise, a symbiosis of pedagogies has an opportunity to occur. Through the process of creative insight, a deeper visionary state can be induced, encouraging meditative and visionary opportunities, extending and deepening our scientific literacy and eco-vocabulary beyond that which is logical and language based. (Aviva Reed, photo reflections)

This symbiosis resonates with many advocates for arts-pedagogies and sustainability education and is demonstrated through the focus on aesthetics when designing children’s spaces, in particular outdoor play spaces.

Dimensions Foundation in Lincoln, Nebraska, USA, who were participants in this research, developed a ‘Nature Explore’ classroom model to encourage creative outdoor spaces in early childhood settings. These spaces are designed to encourage environmental engagement, creative play and aesthetic appreciation. Having built or consulted on more than five hundred of these outdoor classrooms throughout the USA, they have just completed a post occupancy study on the effects of the Nature Explore classrooms on the children and educators who play and work in them. While the research is yet to be published, the preliminary comments from one of the principle stakeholders is testament to the value of creative, aesthetic and natural surroundings. “Research on these natural outdoor classrooms indicates that teachers who use them credit the enhanced aesthetic value and natural, open-ended materials available to children in these spaces as two key ingredients for supporting all learning opportunities, including creativity” (Kiewra & Veselack, 2016, p. 71).

Outdoor play spaces for children are in focus as we head toward the end of the second decade in the 21st century with key proponents highlighting the need for aesthetic, inclusive and artful design (McConaghy, 2008; Ward, 2011, 2016), places where children can experience a sense of wonder (Wilson, 2010) and where children can be physically engaged and test the limits of their bodies (Little, 2017).

Theories of the human/nature connection & econnection

Numerous approaches to conceptualising the human/nature connection have emerged in recent years. Some of

these approaches have their roots in the field of children's geographies from which a post-humanist emphasis on the reciprocal interplay between child and environment comes into focus (Hultman & Lenz Taguchi, 2010; Rautio, 2013).

An additional consideration is the post humanist turn in sustainability education that characterises human interaction with the planet as one involving two-directional agency where the human is decentred and their interactions become intra-actions that recognise and acknowledge the affect that the natural world has on humans as well as the impact we have on it (Hultman & Lenz Taguchi, 2010; Rautio, 2013).

Other researchers focus more on connections to place and creative exploration of it, rendering flora or fauna or landscape vistas as creative artefacts through drama, visual arts, dance and music (Somerville, 2011; Wattchow & Brown, 2011). Others still have their roots in the human biological affinity with the natural world or biophilia (Wilson, 1984), psychology or ecopsychology where behaviour and identity are affected by connection to the natural environment (Louv, 2006; Roszak, 2001). Cognitive affect is emphasised in Attention Restoration Theory (Berman, Jonides & Kaplan, 2008) and in the exploration of children's executive functioning in Schutte, Torquati and Beattie's work (2017). They contend that learning capacities are restored or enhanced by our exposure to elements of the natural world.

The notion of *econnection* developed throughout this research acknowledges the relationships that humans have with the non-human world through ecopsychology, biophilia and place connection. In addition, the concept of *econnection* includes affective states such as wonder (Wilson, 2010), the notion of love for the natural world (Gray & Birrell, 2015) and the affinity that we have with the natural world through artistic sensibilities such as recognition and appreciation of colour, movement, dynamics, touch, form, sound and smell (Eisner, 2002). These fundamental qualities not only assist us to apprehend the phenomena of experience but also work deeply into our long-term memory, assist us to consolidate understandings, build up schema and, through creative expression, to reengage with and relive experiences after the primary occurrence. The combination of these effects enables a deep sense of connection and belonging to place and to the natural world that is inherently engaging and goes to the heart of human experience as it relates to living on earth. Where primary

experiences in the natural world and inclusion of natural materials are integrated into the curriculum and brought to life through the skillful scaffolding of educators who are already practiced in supporting arts experiences, the scope for deep engagement with sustainability education, place, culture, and our planet is immense (Somerville, 2011). Awakening this sense of *econnection* opens up infinite possibilities for creating and facilitating curriculum aimed at sustainable life on our planet for the children with whom we work. **“Early childhood educators have a unique opportunity to incorporate environmental education into the curriculum and intentionally support young children in developing a relationship with the natural world”** (Torquati, Gabriel, Jones-Brand & Leeper-Miller, 2010. p. 104).

Sustainability and health

Children in Australia are now less engaged in outdoor experiences than ever before and as result are becoming 'fatter', sicker and less mobile (Tranter, 2006; Tranter & Sharpe, 2008). The causes are many, including limited parental time for supervision or monitoring of outdoor activity, concerns about stranger danger (Malone, 2007) and risk aversion (Wyver et al., 2010), particularly when it comes to risks associated with challenging physical activities for children (Gill, 2007).

Studies show that children's physical health is supported by varied and challenging outdoor environments (Dowdell et al., 2011; Dymont, Bell & Lucas, 2009; Fjørtoft, 2004). In addition, children's focus and attention capacities, including attention deficit disorders such as ADHD, are positively impacted by access to, and time in, natural or green spaces (International Union for Health Promotion and Education., 2009; Taylor & Kuo, 2006), affording greater scope for self-regulation and capacity for learning. This is consistent with the work of Davadand et.al (2015) and Berman (2008) who highlight the cognitive benefits of engaging in nature. Development of resilience and prosocial behaviours are also reported by Chawla et. al. (2014).

Sustainability and social justice

When children talk with each other and their teachers they have the opportunity to learn about other's perspectives and to engage in collaborative problem solving (Kiewra & Veselack, 2016, p. 72). This also applies to discussions between children and adults about the community and the natural environment and how we engage with it.

The ongoing work in the Child Friendly Cities Program (Malone, 2013) is a world-leading example of the role that children can play in improving their communities so they are more suited to their needs for play and engaging with others in varied, challenging and safe environments. Children participating in the design of community spaces is also becoming more common in early childhood (Malone, Dimoulas, Truong & Ward, 2014). In North West Sydney children from early childhood settings and a local primary school (Years 1 to 3) were engaged in research to reconceptualise and redevelop a community play space in a local shopping village. Such collaboration also occurred in a Queensland early childhood setting (Davis & Pratt, 2005), resulting in positive changes to the nearby local park and in the practices of a local business whose shopping trolleys were part of the litter problem. In this sense, education for sustainability can be transformative on a private and public level.

In recent years, the links between outdoor education, sustainability education, and social justice and equity have coalesced and become part of a broader view of sustainability education (Kellert, 2012; Orr, 2005). The community engagement outlined above highlights large scale, collaborative and informed community action between young children and adults. The other end of the scale is represented by the micro practices of composting and recycling in early childhood settings. While both have a role to play, the engagement with the arts in this research is attempting to encourage educators and the children with whom they work, to examine, interpret and make meaning from their experiences in the environment and to identify the treasures and troubles inherent in what they are encountering. The aim is to develop a sense of *econnection* that provides a basis for interaction with the environment, and an underpinning rationale for living in a state of regenerative coexistence on the earth. This requires multiple ways for children, young people and adults to engage with sustainability understandings and actions toward change.

The synergies between arts and experiential nature education and their combined capacity to imbue sustainability understandings and change social behaviours are becoming well recognised in the community sector and are increasingly included in higher education courses in both Canada and the USA (Inwood, Heimlich, Ward & Adams, 2017; Inwood & Jagger, 2104).

This research aimed to develop an international tapestry of educational perspectives about 'next practices' in the area of sustainability education for young children. The *IAPENE Handbook*, resulting from Stage 1 of the research, provides a useful basis from which early childhood educators can work with children to recognise the features of their environments and the way in which they interact with them individually and collectively.

Sustainability and education policy

There is a long history of sustainability education declarations and policies both nationally and internationally. However, a common thread among all of them is summed up by the UNESCO declaration:

Environmental education should prepare the individual for life through an understanding of the major problems of the contemporary world, and the provision of skills and attributes needed to play a productive role towards improving life and protecting the environment with due regard to ethical values. (UNESCO, 1978, cited in Elliot & Davis, 2009, p. 67)

While in 1978 the focus was on understanding the problems related to our utilitarian approach to the environment and to mitigating these, since then we have ventured into many other realms of relationship with the natural world with varying emphases on cognitive understandings, primary situated experience, affective, psychological and post humanist engagement with our planet. While we now have a considerably more multifaceted and nuanced approach to engagement with ECEfS in the early childhood field, the urgency, first articulated by Rachel Carson (1962) and UNESCO, has intensified. Since the phrase 'climate change' has become common in our societal discourse in Australia we have developed the National Curriculum where sustainability is a cross curriculum priority for schooling (ACARA, 2017). *The Early Years Learning Framework* (EYLF) (DEEWR, 2009) and the National Quality Standard (ACECQA, 2016), and their respective curricula and quality assurance frameworks, also mandate the inclusion of education for sustainability in the Australian early childhood sector. Early childhood education for sustainability is promoted by peak bodies, such as the Early Childhood Environment Education Network (ECEEN) and Early Childhood Australia (ECA), who recommend outdoor nature play experiences

and promote age appropriate curriculum content about the environment.

The links between sustainability education and early childhood pedagogies are not always well understood. If the aim is to make sustainability education a cross curriculum priority in

early childhood, an understanding of, and practice in, curriculum integration is necessary. One that is built on econnection and arts based exploration is an educationally and socially appropriate way of supporting such aims. This research project can be seen as a direct response or contribution toward filling this gap.



Ephemeral artwork at the beach

METHOD - OVERVIEW

The research was conducted with ethical approval from Western Sydney University Human Research Ethics Committee: Approval Number H11092.

An interpretivist, inductive approach underpins this research, with the qualitative methodology in Stage 1 including mixed methods such as open response interviews and photostories (Wang, 2008). Analysis focused on searching for patterns of similarity and difference to identify common themes. Reliability is conferred through the number of participants in the initial stage (30) (Gray, 2014) and the mixed methods employed (Creswell, 2007). Stage 2 engaged inductively oriented practitioner action research with findings and analysis reporting on the educators' engagement with the IAPENE Principles, Reflections and Practices developed from Stage 1 and the outcomes of their use of this pedagogical tool.

Stage 1

Stage 1 of the IAPENE research project involved engaging with an international group of 13 early childhood educators, 7 preservice teacher educators in the higher education sector, 5 community Non-Government Organisations (NGOs) conducting community sustainability programs, and 5 community arts specialists engaged in arts-based advocacy for sustainability education. The perspectives of the 30 participants were then analysed and developed as a series of principles, reflections, and practice recommendations consolidated in booklet format as a pedagogical tool - the *IAPENE Handbook* (2017a). A mixed method approach was adopted to capture both verbal and visual modes of communication. There were three types of data collected using three methods: oral data by way of interview, visual data in the form of photographs, and written responses reflecting on the photographs.



Preservice teachers in the garden

1. Interviews

The interviews were semi-structured, with the participants having prior knowledge of the questions to be asked. Given the vast geographic catchment of the project, these interviews were conducted in person where possible and via internet video calling platforms where necessary (see Appendix 1 for Stage 1 Interview Questions). The interviews were recorded and then transcribed by a professional transcription service. The transcriptions were coded using Nvivo software.



Inspired by nature composition

2. Photostories

In a process underpinned by theories of symbolic interactionism (Gray, 2014), the participants were asked to take photographs of workspaces and resources that were meaningful to them. They were then asked to choose a small number of photographs in each category and reflect on the relationships they have to their work (see reflective questions for photographs, Appendix 2) and to document the reasons for their preferences. This process does not focus on the researcher studying the photos so much as the participants identifying the meaning in them and their reasons for prioritising the chosen images above others (Bignante, 2010).



Sunflower and butterfly in preschool garden

3. Production of Pedagogical Tool

The researcher, guided by the constant comparative method (Corbin & Strauss, 2008; Glaser, 1967) and in consultation with the participants, developed categories which were used to identify common themes (Creswell, 2007) regarding the integration of arts pedagogies and experiential outdoor education. Recommendations for Principles, Reflections for *Econnection Pedagogies*, and for Practices were then consolidated from the data and together formed the *IAPENE Handbook* for trial in the early childhood sites in Australia and Lincoln, Nebraska.

Stage 2

The *IAPENE Handbook* developed in Stage 1 was printed and distributed to six participant services in Sydney, Australia, and one in Lincoln, Nebraska. The setting in Nebraska is operated by Dimensions Foundation, who implement and manage the ‘Nature Explore’ Outdoor Classroom project. The settings in Australia are operated by Western Sydney University Early Learning (WSUEL). Participating educators in each centre were asked to reflect on the Principles, consider the Reflections for *Econnection Pedagogies* and implement the recommendations for Practice developed in Stage 1 into their settings in a manner that was consistent with their values, principles, and programs.

Data gathering processes were developed collaboratively between centre management teams and the researcher, and were entirely consistent with each centre’s obligations for duty of care, privacy and protection of children. The

data collection utilised a number of media, including photographic journals, learning stories, observations, and individual photographs, collected by the educators, all of which were analysed and contributed to the findings. A focus group was also conducted with the educators in each setting at the conclusion of the implementation phase.

The focus groups were conducted in a variety of ways due to scheduling and distance. In some settings, the participating educators wrote combined responses to the focus group questions, whilst in others, individual responses were provided. In yet others a more conventional focus group was conducted face-to-face at a staff meeting and recorded. Consistent with the constant comparative method, all data types from the early childhood sites were collected and analysed and the emerging patterns in the data were analysed and included in this report.

STAGE 1 ANALYSIS AND FINDINGS

The Principles, Reflections for *Econnection Pedagogies*, and Practices below were developed through engagement in a series of conversations with the 30 international participants as indicated above. The participants also contributed to the development of the IAPENE Principles, Reflections for *Econnection Pedagogies*, and Practices, by reflecting on drafts of the document and providing their feedback –delivering an international, multidisciplinary perspective. This process resulted in a document that is a constructive and supportive provocation for educators in early childhood settings who are engaged

in implementing arts-based pedagogies for ECEfS. It was also intended that the Principles, Reflections for *Econnection Pedagogies*, and Practices included in the document would promote stronger curriculum integration between the arts and sustainability education. There are many terms used to depict the natural world including environment, bush, forest, woods, green space or place. The term *outdoor learning space* has been used here to encompass outdoor classrooms, play grounds or gardens in early childhood settings, and the natural world or green space or place to refer to wilder bush, forest or woods.

“ Interpretation of the natural world through the arts, when included in early childhood curriculum, enhances children’s and educators’ awareness of the local and regional natural environment. ”



Collaborative play with water



Rest time under the trees

PRINCIPLES

The benefits of regular experience in the natural world or outdoor learning spaces are many. They include engendering a sense of belonging to and knowing a place (Sobel, 2005; Somerville, 2012; Wattchow & Brown, 2011) and multiple physical, psychological and mental health benefits (Dowdell et al., 2011; Kaplan, 2001; Ward, 2016). There is also considerable scope for imbuing cultural knowledge and practices of first nations people through stories of place, engagement in place and creative expression of place through the arts (Suzuki, McConnell & DeCembra, 2003).

A sense of purpose is reported when children interact with the natural flora and fauna of their place which is evidenced through their creative play and expression (Torquati et al., 2010). This can include permanent or ephemeral visual arts, movement, music making or sound appreciation, drama and role play (Ward, 2017b). This sense of belonging and embodied intra-action becomes an interplay of art and play where the objects and modality of expression are dictated by the environment in which the player is situated and the player’s enjoyment of and experimentation in the space.

PRINCIPLES	DESCRIPTION
	
1 We are part of and made of the same materials as the earth and all the elements of the natural world – our bodies are biophilic in nature.	Human beings are part of the earth and evolved from the earth. We are part of nature and nature is part of us. We all breathe the same air and require food to survive.
2 Engagement with the natural world is perceived through the body and the senses, and mental faculties.	We see, hear, taste, feel and smell at a physical level. We also make meaning from these representations of nature.
3 Experiences in the natural world affect us emotionally and the body and the senses mediate this affect.	We experience a range of emotions in response to our physical and cognitive experiences of the natural world, including awe and wonder, fascination, curiosity and fear.
4 There is a psychological effect that relates to our sense of being and belonging when engaged in the natural world.	Frequent experience of a place, e.g. a landscape or green space, can bring a sense of belonging, assist in restoring mental faculties and engender a feeling of well-being.
5 Engagement in the natural world is a dynamic process that engenders awareness and an embodied, integrated perception of form, colour, sound, movement, touch, smell, taste and awe.	We become aware of the features of the natural world as an interconnected series of sensations and develop an understanding of it being a complex living organism with ongoing potential to generate life.
6 Form, colour, sound, movement, touch, smell, taste, relationships and awe are the basis of creative, artistic expressions of the natural world which facilitate deeper, multimodal knowing about ourselves and nature.	Experiences in the natural world lend themselves to investigating properties, patterns and relationships. Through creative exploration we come to know the natural world and our relationship to it at an embodied, emotional and psychological level.
7 The integral embodied, psychological and emotional interconnection between human beings and nature is deepened through artistic appreciation, engagement and expression.	Artistic engagement is just as important as a lens for perception as it is a vehicle for expression. When we perceive and express the dynamic, interconnected relationships between what we see, feel, hear, touch, taste and smell, through the arts, metacognitive and intuitive ways of knowing are possible.
8 Relationships with place and nature form the basis for developing sustainable models of existence on the earth.	When we spend time in a place, when we think about it, when we know about it, and when we love it, we want to look after it. This is often initially expressed in routine activities such as recycling, composting and gardening, and with experience extends to participating in action for protection of the natural world. This may include making sustainability oriented decisions about shared space with other than humans, eco-justice issues, or our footprint on the earth.

REFLECTIONS FOR ECONNECTION PEDAGOGIES

Engaging in any new pedagogical practice starts with reflections on our own practice and this is the same for econnection pedagogies. Reflecting on the natural world is easier if we have some primary embodied experience in it. Incorporating the language of the arts, the reflective practices outlined below assist in broadening our perception of our environments, regardless of their type, and assist in identifying their properties, their effect on our thoughts and feelings and on our sense of econnection.

Our sense of belonging to a place is enhanced when we know more about it and have experienced its features through many ways of knowing. When we have this

econnection understanding as educators, we can facilitate similar creative experiences for the children we teach. This reflective process provides opportunities to engage in sustained shared thinking (Siraj-Blatchford, Taggart, Sylva, Sammons, & Melhuish, 2008) about the natural world inside and outside the setting gate, and our place in it. Research shows we are more likely to care for a place that we know and love and have seen others caring for (Chawla & Flanders Cushing, 2007; White & Stoecklin, 2008). The following reflection prompts are a series of awareness moments that are designed to assist the educator to view indoor and outdoor environments through an ecological lens and to be artful in their perceptions of place.

REFLECTIONS	EXAMPLE
	
1 When looking at the natural world, elements from it, or at natural resources, take a moment to wonder at the materiality of it/them and how they came to be.	Think about the water in the stream - where is it coming from? Consider the pattern of the bark on the tree – what forces shaped it? Consider the song of the lyrebird. Where does it get the ability to mimic sounds so well?
2 Make a conscious note of the types of lines, forms and colours you can see when engaged in a green space.	How many different greens can you see? What forms and shapes can you see in the leaves, rock, clouds and mountains? What is the relationship between straight lines and curved lines in your view?
3 When engaged in a green space, watch and listen to the movement and sounds you can see, feel and hear.	What is the movement of the wind – is there a gentle breeze on your cheek? What sound is the wind in the trees making, or the birdsong? What is moving around you and where is your body in the space?
4 Be aware of your own and the children’s bodies in the green space and the ways in which they are interacting. Consider the effect other humans have had on the space.	What does the space entice you to do: smell the flowers; run your fingers through the water; climb the tree or slide down the hill; sit on a big rock or make patterns with the seedpods? What impact does your presence have in the space?
5 Try to find, see or imagine which animal species live in the immediate area and what the space might be like from their eyes.	Imagine there is a family of ducks nearby: A mother and 5 ducklings. Describe what they look like, what they eat and sound like. Where do they go? What do they do if people are near, or if dogs or snakes are near?
6 Consider one species that you know to live in the immediate green space. Reflect on what you know of their habitats, lifecycles and social interactions.	Are there squirrels or possums in the trees? Where do they live and what do they see or do in the space? Are there stick insects about? What does the world look or sound like to them? What do they eat? Where do they live?
7 Consider the ways the human elements (buildings or other constructions) blend with or complement the natural world or the ways in which the natural world has been used to complement them.	How do the structures work with the space? Do they complement it, blend in or look somewhat out of place? How do the natural elements affect the look of the structures? Are their gardens or vines growing beside or on them or trees shading them? What might the designer of the space have been thinking in planning it?
8 When in built environments look around at the components of the buildings and furniture around you and consider the origin of these raw materials.	Look at the textiles, glass, concrete, steel, plastic and timber in the room. Also consider the soft furnishings. Consider where these materials come from. Think about how many rooms like this there are in your town or city.

PRACTICES

Spending time in the natural world and creatively reflecting on it is the first step to putting *econnection* pedagogies into practice. Looking at materials, processes, and relationships through the lens of their ecological provenance and cultural effect provides for a broader view of experience. This expanded view brings sustainability into the forefront of everything we do. When children see these thought processes modeled through the program planning, and the resources and experiences available to them, and when they

are scaffolded to approach their engagement with the world through this creative ecological lens, they will also start to bring new thinking and new ways of being into their lives. The suggestions for practice below can be applied to early childhood settings from the city to rural environments. It is intended that they be applied in a manner that is consistent with the health and safety requirements of the setting and with the values and philosophy of the organization.

PRACTICES	EXAMPLES
1 Take children into outdoor learning spaces at the early childhood setting and to green spaces beyond the setting gate as often as possible.	Program as much time as possible in the outdoor learning space with the awareness that children are learning both indoors and outdoors. Recycle, and create gardens and compost heaps. Investigate local parks or green spaces where you can take the children regularly.
2 Watch and listen for the enrichment moments that arise when a child engages with a feature of the outdoor learning space or green space. Respond to them through conversation, questioning, creativity and enthusiasm.	Children notice their environments. A question about a train of linked caterpillars can generate ongoing program material including investigation of habitat, viewing life through the eye of a caterpillar (develop stories) and looking at their relationships with other species. Visual arts, drama, music and movement are all useful modes of exploring these elements.
3 Observe how the children interact with the space in an attempt to identify the meanings they are making from their interactions. Provide experiences to enrich and extend their understandings and <i>econnection</i> . This may mean taking action as much as letting the children be, to engage on their own.	Children engage with space in a variety of ways and learn much about the world in doing so. Do they watch insects, build dens or cubby houses or make patterns with leaves? What questions do they ask, what games do they play and how does the space influence their play? What are they learning and what can you do to enrich their experience? N.B. This may simply mean providing time for them to be in rich learning spaces.
4 Share your own sense of wonder and your reflections about the natural world, and the dynamics of the sensory impressions that it engenders.	Share impressions while in the natural world and/or stories of landscapes or experiences that have delighted, amazed, inspired or scared you. Try to include descriptions and dynamics that will bring life to your impressions or the tale you are telling. These stories will help the children to name, describe and understand their world.
5 Model creative responses to your impressions of the natural world or natural phenomena when in green spaces through ephemeral visual arts, song, movement and story creation.	Create the horizon line with twigs and stones or make intricate patterns reflecting a spider's web using twigs. Make leaf drawings or patterns or create a daisy chain for wearing. Create small songs in situ or mimic the movement of the wind in the trees.
6 Revisit and build on elements of experiences in the outdoors while engaged in indoor programs through all arts modes, including story creation.	Recreate moments of experience from your outdoor adventures. Research the animals or insects seen, ask questions and create likely stories about them. Paint, draw, move and sing about the animals, trees, birds, elements and landscapes.
7 Provide natural materials for the children to use that invoke different landscapes, natural phenomena, animal species and relationships.	Include seed pods, shells, driftwood or bark and leaves of various kinds in the loose parts available for art and for play. Consider grouping items for provocations of particular landscapes: e.g. a cuttlefish husk, shells and driftwood arranged on a blue sea-evoking cloth. Explore their provenance and create stories about their possible history.
8 Record observations of the children's <i>econnection</i> oriented play, anecdotes, artifacts, work samples and interactions. Further explore subject matter, objects or phenomena in which they are interested.	Record what the children take an interest in with regard to stories, materials and outdoor experiences. In what ways are their interests reflected in their play, artwork, conversations and interactions with others? How can you provide experiences that will enrich these understandings and experiences of the natural world and their place in it?

STAGE 2 FINDINGS

Introduction

Educators in Sydney, Australia, and Lincoln, USA trialled the *IAPENE Handbook* for a period of three to four months in 2016.

The six early childhood settings in Australia had between eight and 15 educators each. Personal visits were conducted by the researcher to introduce the *IAPENE Handbook* and discuss with the pedagogical leaders or directors of the settings the ways in which educators might consider using it. This was followed a month into the trial period with a further visit during a staff meeting, where most of the educators were present.

As is apparent in a number of similar studies, there were two to three champions of sustainability practice (Elliot & Davis, 2009) in each of the settings, whose engagement with the *IAPENE Handbook's* Principles, Reflections, and Practices were leading practice in their settings and engaging their colleagues.

Digital copies of the *IAPENE Handbook* were sent to the Nebraska centre at the beginning of the trial phase and the researcher then visited the setting when the educators had been using the document for a period of six weeks.

The *IAPENE Handbook* was predominantly trialled in one preschool room, but the document was shared with educators from other rooms, resulting in broader engagement than first anticipated.

In both the Australian and USA settings, visiting after a period of engagement with the handbook provided opportunity for rich conversations about what the educators were doing, what questions they had about the project and where they thought they may develop sustainability content in their programs, based on what had occurred in their settings already.

The final engagement with the participating early childhood settings was a digital or face-to-face focus group. The focus group with the USA setting was via an online conferencing facility. In Australia, focus groups were held at four of the six settings. At one of the settings, educators provided their responses to the focus group questions in writing at a staff meeting without the researcher present. Another early childhood setting passed the document with focus questions and responses between the relevant educators so each could see what the others had written prior to adding their own



responses. This was considered a reasonable compromise in order to capture the data that would otherwise have not been available, due to the busyness of the end of year program in these early childhood services and the difficulty in finding a mutually suitable time to meet more formally.

Participating educators were asked a number of questions to find out about their experiences with the *IAPENE Handbook* (See Appendix 3 for the questions). The questions covered

1. The overall usefulness of the *IAPENE Handbook*,
2. The way in which it was used as part of their pedagogy and practice,
3. The extent to which the educators noticed any changes in their personal engagement with the local natural environment,
4. The extent of any growth or change in education for sustainability practices in their settings,
5. Any observations regarding children's learning about the local natural environment – place in education for sustainability,
6. Children's linguistic expressions of place and the natural world – echoes of new understandings,
7. Play in and around place – how children's play incorporated new understandings about the natural world and
8. A naturally artful world – how children's art(efacts) reflected new understandings about the natural world and place.

Their responses are reported below under these headings.

NB: CS = Childhood Setting; FG = Focus Group; 1 or 2 indicates first or second focus group.

Two of the four settings, visited in person, also emailed digital versions of the focus group questions. This was unsolicited. Where this occurs F1 is the first focus group feedback and F2 indicates the second round of responses.

Overall usefulness of the *IAPENE* pedagogical tool

The usefulness of the *IAPENE Handbook* developed in Stage 1 is reported under three different sub-categories: Principles, Reflections and Practices. This is to reflect the

ways in which participants responded to the first question regarding overall usefulness of the pedagogical tool.

Principles

Responses about the usefulness of the *IAPENE Handbook* covered three main topics. The first included the extent to which it could assist them in deepening the children's engagement in and understanding of the natural world, with one respondent saying: “... really great provocations and ideas to add depth to children's understanding and engagement in the natural world” (CS1FG1) and another indicating that 'the tool allows for more meaningful interactions and observations of green spaces and the natural world.' (CS4FG1)

Educators articulated particular principles that resonated for them and that provoked them to think differently or more deeply about their own practice. The educators in CS1FG1 indicated that Principles 2, 3 and 4 were most relevant. These principles apply most strongly to our embodied and affective connections to the natural world and contain clear links to applications for engagement in an educational setting. Educators in CS5FG1 noted that they “connected to Principle 4 a lot, with [regard to] the psychological effects that I have felt from being in nature and experiencing these things myself.”

Secondly, respondents articulated the scope for using the document to assist in promoting connection to the natural world on behalf of all stakeholders, and to redress the lack of information about this topic in public documentation available to guide curriculum practice in early childhood services.

An educator in CS1FG1 added Principle 7 which related to way in which all human modes of connection to the natural world are deepened through artistic engagement, as a key Principle. This was a new insight for this educator and clearly had an impact on the depth of her engagement with the natural world and her work with the children in this curriculum area.

The third most articulated response was with regard to the practical nature of the document and the way in which it assisted educators to recognise and employ integration of the arts and sustainability education.

“It helped in seeing how to implement nature pedagogical practice and embed it into our service. Gave a better understanding about nature pedagogy in a format we are familiar with.” (CS5FG2)

Reflections for *econnection*

The reflection prompts were aimed at encouraging deliberate processes of engagement where pedagogy and practices were included in the educators' critical reflective practice and evaluation processes. They were most useful in the settings where there were experienced educators who had incorporated these practices into their everyday professional practice and in settings where the educators had an existing focus on outdoor education. Educators in CS6FG1 commented that the Handbook caused them to reflect more deeply. In another setting an educator reflected:

”I found Table 2: Reflections, the most helpful to plan for the month. The examples were questions which triggered my creativity and allowed me to question how I was using the natural world in play. Questions are always the most meaningful for me when I am planning. What surprises will the children find, smell, touch, hear? Therefore, I need to be ready with several lessons or to be intentional asking open ended questions as we journey on our pathway. How long is enough time for children to experience our pathway from the [outdoor] classroom to the building? How long does it take for children to find a sense of place even when it is a pathway and not the classroom? As the seasons change on our pathway, what will the impact be on the children? Will we be able to see animals as we travel on our pathway? Will I need to direct learning or have we prepared in play for all the many surprises we might find on our journey? These are the experiences to scaffold. (CS7FG1)

Another educator found that the Reflections were “more relatable personally [than the Principles] and [sic] have a great range of sensing the natural world. I found these very easy to understand and can see myself being able to put these in place within our programme and practices” (CS1FG1)

Educators in CS2FG1 found the reflections particularly useful and asked: 'Why is the green frog in our worm farm? Is he there to eat the worms or have a chat to them?' This ready engagement with reflective practice for the educators, who are often very busy and have to prioritise time for this, is most encouraging. That many of them found the Reflections in the *IAPENE Handbook* useful indicates a degree of resonance with their ongoing work in the area of Early Childhood Education for Sustainability (ECEFS).

Practices

The strongest response with regard to the question about the usefulness of *IAPENE Handbook* was in the area of practices.

An educator in CS5FG2 noted that Practice 4 “was the easiest to implement in the learning environment”. This is not surprising in busy working lives when there are examples of practice that can immediately relate to one's own. A number of educators said that starting with the Practices was useful as they were a way into the ideas contained in the *IAPENE Handbook* and facilitated further engagement with the more conceptual content of the Principles and Reflections.

Educators in CS1FG1 found the Practices resonant and useful, with one stating that the Practices “would be easily administered in a large majority of centres demonstrating a broad range of experiences ...”. The Practices were found useful in a different way by educators in CS7FG1, where one educator reported that “Table 3: Practices”, reminded her of “what I need to observe and record in my documentation. It directs my thoughts on important facts to share in order to make children's learning visible.”

Another educator, in CS5FG1, observed that the fact that the Practices contained specific encouragement for engaging with the children in the outdoors was a useful prompt.

Ways in which the *IAPENE Handbook* was used by educators

Educators used the *IAPENE Handbook* in a variety of ways with differing emphasis depending on the ways in which the content intersected with their own experience and preferred ways of working. Some settings discussed the document during staff meetings to brainstorm ways of using the information and found that this also provided opportunity for reflecting on previous practice through a new lens. As one educator noted:

During team teacher meeting time we discussed specific principles in the tool and we each shared experiences we had related to them both recently and long ago. Working through this reminded us of some of the things we have done in the past that were really meaningful. (CS7FG1)

In the following vignette a particularly reflective educator describes a method for integrating understandings from using the handbook into the everyday program:

This year my class engaged in important play even as we transitioned from one place to another. In fact, some days we had so much fun transitioning while experiencing the outdoors that we never made it inside. Beginning on the first week of school, we traveled a longer path when departing from the classroom to the school building. On this route, we encounter large trees, falling leaves for collecting or jumping into, small climbing trees, hills to roll down, tree stump to climb up, large sunflowers to watch bees collect pollen from inside, squirrels, birds, bushes to get inside, a cherry tree to pick cherries, and a picnic table to rest while reading or talking before going inside. Using the principles listed we engaged in the natural world through our senses and emotions. We intentionally became familiar with our surroundings by rolling down hills, climbing trees and tree stumps, quietly listening to the world, playing in leaves and experiencing new perspectives of a tree. Children used descriptive words as they shared their experiences outdoor in play. Later, the children heard their own words written as a poetry or song. (CS7FG1)

This anecdote highlights the educator’s capacity to see

significant meaning in seemingly small moments of engagement. The ‘talking back’ to the children about their experiences by rendering elements of their learning creatively through poetry and song is particularly powerful. It privileges the children’s voices and helps them to relive their experiences again and again as they speak and sing the poetry and music (Ward, 2018).

Educators in CS1FG2 found that the document was useful for guiding approaches to planning ‘intentional teaching experiences for the children.’

Growth and change in education for sustainability practices

The extent to which the *IAPENE Handbook* contained scope for becoming aware of, or supporting, new ways of investigating the natural environment was evident in a number of ways. They included responses that indicated a deepening of focus, looking at the local environment around the early childhood centre in a new light, noticing new aspects of the environment or developing new ways of seeing and interpreting what was in the environment (CS4FG1). The following comment highlights this:

“It [the *IAPENE* tool] generated a greater depth of focus on our interactions with nature and our responses

and provocations to the children.” (CS1FG2)

Educators in CS5FG2 noted that they felt the tool had helped them to move towards “just becoming more aware. Being more open to nature.”

The following comment also indicates habits, or the manner of looking that educators had as children, that were not as evident now that they are adults. It represents a reawakening of artful engagement with the natural world. “This document [the *IAPENE* tool] really shows and assists educators to look at the world in a new light which we may have been accustomed to since our own childhoods.” (CS1FG1)

Seeing in more detail or with additional insight was also a feature for educators in one setting, with one commenting: “I personally feel we explored interest and veered into areas more that were overlooked normally, e.g. insects under rocks and leaves and worms found after rain etc.” (CS1FG1).

The following vignette highlights one educator’s engagement with creative arts practices and in particular poetry and storytelling. This rendering of experiences in the environment or in the green spaces in the community around the early childhood setting in story and prose allows for a deepening of interpretation (McDuff, 2001) and a post-modern emergence of meaning (Somerville, 2013).

It’s always nice to be challenged and asked to clarify why and what your practices are with children. I felt that this complimented my focus and challenged me to try something new. I told my children that on our walks “I grab their words and place them on paper. Using their descriptions of all their brilliant observations - we make poetry.” I want them to think it’s easy and natural to write their thoughts/poetry. I want them to be great observers and feel that sense of place. My question has been- will the children recognize their own words and find meaning in the poetry? So far, the children want to use their words in a dance. We dance a lot! Introducing this tool has helped us refocus as a staff on the relationship between nature and the arts and reminds us how valuable the arts are as tools for expressing what we know and wonder. Storytelling was an art form that we have not emphasized much and so it has encouraged much more of that! (CS7FG1)

Changes in Educators’ personal engagement with the local natural environment

The scope for the *IAPENE Handbook* to promote enriched personal engagement with the natural environment local to their work and home settings was evident in the educators’ responses to this question. The main themes in these responses were about the additional reflection promoted by using the *IAPENE Handbook*, the scope for noticing new elements of their environment and incorporating them into the educational program. The other significant response category was about the sense of place generated through their awareness and engagement.

A greater depth of reflection came from using the *IAPENE* tool as educators considered additional ideas and pedagogies in their interactions and observations (CS1FG2). It’s [the local natural environment] the third teacher and is invaluable in providing and enriching children’s lives with quality learning experiences and understandings. (CS1FG2)

We all need a sense of place and ownership. Your principles should also be true for adults. Connecting to the earth means you have to work and play in it. It is essential to create a relationship in the natural world.” (CS7FG1) “I feel this document [the *IAPENE* tool] assists with strengthening our own personal connection with the natural world which in turn will strengthen the children’s. Educators may learn a lot from the children when utilising this document. (CS1FG1)

An educator in CS5FG1 reflected that during the course of the study that “Even though our space is manicured there are still many opportunities for the children to engage in green spaces around the centre.”



Preschool child watering the garden



Patterns and Design using natural elements

Children's learning about the local natural environment - 'place' in education for sustainability

The educators reported on the impact their use of the *IAPENE Handbook* had on enriching the environmental or sustainability content of their programs. Some of the outcomes were a result of the educators' focus on the Principles or responses to the Reflections for *Econnection* Pedagogies and some were specifically related to the example Practices used in the handbook, which were incorporated into their programs. Feedback related to Principles and Reflections included the children learning “that they are active learners in their world and that they belong to a space that deserves care and respect” (CS1FG2). Another educator said with regard to the Principles, that:

“Using the principles listed we engaged in the natural world through our senses and emotions. We intentionally became familiar with our surroundings by rolling down hills, climbing trees and tree stumps, quietly listening to the world, playing in leaves and experiencing new perspectives of a tree.” (CS7FG1)

She added that “Children need to be curious and want to take care of our world. This is the essence of sustainability – children value their space and their time spent in nature.” (CS7FG1)

The examples of Practice included in the *IAPENE Handbook* included building on the existing sustainability practices so they became connected to the broader environment. Educators in CS5FG2 said that the children began “noticing nature around them” during the study. The practical ramifications of this included enhanced understandings of everyday gardening and recycling process. For example, one educator noted that as a result of the centre's focus on environment and sustainability “children had a better understanding of composting and worms. Knowing their body parts and why they look the way they look.” (CS2FG1)

Linguistic expressions of place and the natural world - echoes of new understandings

The children in the early childhood settings involved in the trial of the *IAPENE Handbook* not only engaged in exploration of many new concepts related to the natural

world, they also expanded their linguistic repertoires. One educator reflected:

“The language that children use when they talk about their place is so intimate. Each day when their parents pick them up from the outdoor classroom they are usually pulled around to see special things or told about what new is happening. It is so powerful so see that.” (CS7FG1)

The children developed broader vocabularies as well as enhanced conceptual understandings, with one educator observing that now: “Children use words that they are unfamiliar with, e.g. compost, rotting etc.” (CS1FG1)

As the children developed a lexicon of *econnection*, they used more descriptive language and the educators captured these linguistic developments in creative ways, for example: “Children used descriptive words as they shared their experiences outdoor in play. Later, the children heard their own words written as poetry or song” (CS7FG1).

The following vignette shows the extent to which this language development supports the children's ability to express their varied perceptions of the world and the meaning they are making from it – and what the educators are learning about the children's way of seeing.

Children express this understanding every day in play. Their language might be defined as the way they move their bodies interacting with nature (heavy, light, feathers that make them fly etc.); materials they choose; the place they chose to play (tree, bushes, holes, walls, sand etc.); or their important words, e.g. “I am collecting”. They tell me what they know and eventually add words through the power of play. I think of their play as a language. The more they engage using their five senses, the better understanding of their natural world. After requesting descriptive words about the world around us (for approximately a month), I found that I only needed to say something like, “View from a Stump...” to initiate words from the children. Words became expected, no judgment, and a little competitive. Some found comparisons with dots or lines, some mentioned colour or size, some keyed in on movement, some heard sound and others mentioned a function of nature (leaves change colours, squirrel eats seeds, leaves fall



down etc.). I want them to think that everyone does this – everyone looks closely and expresses what they see in their surroundings. Everyone uses their imagination which allows them to perceive different perspectives of the world around them. Examples: Lucia sings and dances creating rhythms, Jason painted the wind swirling layers and layers of paint until he had mixed a beautiful blue colour. Also, I found that the absence of noise (us talking or playing) while listening to the silence of nature (birds, wind, acorns falling, etc.) provides surprising discoveries and verbal description just by being very still. The children can't wait to tell you what they hear (takes practice!!!). The scientific and mathematical vocabulary seems to get richer because there is such diversity in what children are trying to describe. Also, I think that children are so eager to share what they are noticing in nature that there are more and longer conversations between them and with adults. (CS7FG1)

Play in and around place - how children's play incorporated new understandings about the natural world

One of the features of the trials of the *IAPENE Handbook* was the focus on outdoor play. Indeed, the *IAPENE* Practices highlight the value of primary experiences in the natural world or in environments where there are elements of nature. While the extent of the natural elements varied across the early childhood settings, the ability to connect with them was

facilitated by the arts-based pedagogies which resonated with the children's sense of place. This is consistent with place-based pedagogies where significant and frequent experiences in and with place generate a stronger sense of belonging and relationship (Somerville, 2011; Somerville, 2013).

For example, in one setting the children

“used their senses when smelling the scents rising from the compost when opening the lid or experienced the scent of ‘chilli rocket’ which was currently growing in our veggie patch. Cooperation, communication and collaboration are used highly when children engage in the experiences provided by our yard.” (CS1FG1)

In another setting the educator reflected that Principal 8 – Sense of place – is the most important, commenting that the children “feel a sense of place even on the pathways near and through our outdoor classroom”. She observed that “they each have their special places on the path. ... Each was showing me important places” (CS7FG1).

Educators in CS7FG1 reported that the loose parts became invaluable props for the enhanced creative play. Stumps were used as campfire circles, branches and poles became horses or the framework for cubby houses. The bushes became the natural places for hiding or for quiet reflection and even the dirt and mud pit were used as creative props in the children's play.

A naturally artful world - how children’s artefacts reflected new understandings about the natural world and place

When the program content captures the children’s imaginations, it becomes evident in their play, their language and in their creative artefacts (Ward, 2011, 2016, 2017b; Wilson, 2010). Given the extent to which these expressions can convey meaning, the children’s artefacts provide insight into their developing understandings of the world around them. The educators provided numerous examples of the children expressing new understandings through their artistic expressions. For example:

Children show their understandings through drawings and through expression. Children daily draw pictures of their natural environment and wildlife. ... Each drawing shows evidence of their understandings and perceptions of the natural world. A group discussion of the natural world allows students to consolidate their learning [sic] as well as push to a higher order of thinking. Setting up experiences that use natural resources gives children free access to create and express freely their representations. (CS1FG1)

The Hundred Languages of Children (Edwards, Gandini & Forman, 2011) teaches us that children convey their meanings in multiple ways and that we as educators need to value their modes of expression and facilitate visible documentation to support it. While many forms of artefact are ephemeral, they can still be captured through images or through discussing them with the children and taking notes or recording the conversation. The following comment is an example of the children’s development of ephemeral arts pieces. “The children have participated in the ephemeral arts more through the loose parts supplied in the science area. Investigating the patterns and imagery they can create, as well as mathematical concepts such as symmetry and seriation” (CS5FG1).

Educators in CS4FG2 also echoed the value of the loose parts in the outdoor space, commenting: “The children were interested in the arts more. Children explored the loose parts and used them as part of their learning tools. They explored the different elements of fruits, vegetables and growing plants.”

Other expressions of art were more permanent, resulting in a predominance of drawings, paintings and sculptures all

depicting elements from the natural world. This is consistent with a previous study, where 27 of 29 self-initiated drawings by 3 to 5 year old children, over a period of three days, were explicitly representing content from the local natural environment (Ward, 2011). Observing, discussing and documenting, using all of the means available to us are the keys to facilitating this expression of meaning, and to better understanding the children with whom we work (Kolbe, 2005; McArdle, 2012). The following vignette highlights the educator’s rich descriptions of the children’s engagement in the outdoor classroom.

So far they have expressed their knowledge through building habitats for animals out of blocks (inside) and chunks of wood outside; documented butterflies and insects using paper, pencils and clipboard while closely observing outdoors; and combined sand, dirt, woodchips, water, leaves, acorns and stirred in a large container. As they collected elements of fall and turned it into food, a family meal was served to anyone who wanted to join in. Children were able to categorize the elements of nature that best proved to be the correct size and texture and interest for their wonderful concoction. Children were very inclusive as they engaged in pretend play using unlimited materials One child blocked out the busy loud play to hear the rustling of leaves as they swirled like a tornado in the air. He imitated movement with his body, described the sound it was making in the wind, named the movement by comparing it to a tornado and shared his great discovery. One child dances and makes up special rhythms as she speaks when asked to closely observe and give me words to describe what she sees. Children mix colours to match nature. They seem to express themselves and their relationship with their place quite naturally. We are reminded that probably the biggest changes happen with our ability to recognize and appreciate what it is that children are showing us. When we do that, it is such a celebration for us all! (CS7FG1)

Educators in CS3FG1 also indicated that the artistic expression seemed to include more natural elements. They reported that children were asking for things like, sticks, leaves, straw and mud to include in their artworks and their clay sculptures.

LIMITATIONS

The *IAPENE Handbook* had its limitations, with educators in one setting reporting that they:

“...felt overwhelmed by the document, as it contained so many principles and pedagogies, in addition to the already regulated documents they’re required to know and reference.” (CS1FG2)

While a focus of participation in this research was to find more relatable and less onerous ways of considering and including ECEfS content, the existence of yet another document with which educators are being asked to engage is a genuine issue for some.

For CS1FG1 “some areas of the principles could be defined and/or explained more clearly. Giving a better understanding to someone that has a limited personal experience with these principles may [mean they do] not comprehend the principles and/or descriptions clearly.”

There were comments from two educators about the timeframe of the trial period with one suggesting: “The document would have been better used if implemented gradually/periodically over a longer timeframe e.g. 1 year” (CS1FG2).

This need for longer timeframes and more training was also expressed by an educator in CS1FG1 who “...wasn’t able to utilise this document as much as I would have liked to, due to the stresses of daily work routine and work load, and taking on an additional curriculum document that I’m less familiar with. I can see utilising this document with the right educational development for staff will assist with incorporating this in their own planning and programming within the centre.”

Further on, this educator indicated a need for more accessible language “There were some words where I felt it was hard to comprehend their meaning exactly e.g. Artistic engagement. Curriculum documents are best utilised when their meaning is displayed in a user-friendly way, making sure all content is relatable to educators at all times... having scenarios and/or case studies throughout this document will emphasise and enhance comprehension for educators.”

Differently expressed, but resonating with the difficulty of balancing practicality with depth, an educator in CS7FG1 noted:

I think there may be some language differences for me as an American that needs some translation. It is acknowledged in the document that terminology varies across the countries represented. Discussion with colleagues is helpful therefore to interpret things together and make it all seem more familiar. Even more examples might be useful but then of course the document becomes less of a tool and more of a curriculum or handbook.

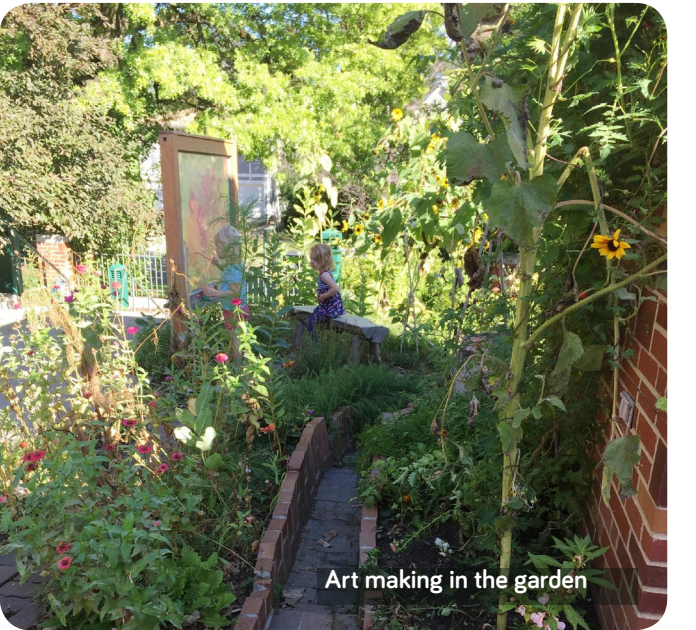
Suggested improvements

Educators provided some very helpful advice for making the *IAPENE Handbook* more user friendly. They included suggestions to create additional resources, for example

posters for each principle to be able to display and refer to both during planning and documenting learning. It may have been good to focus on a new idea/principle per month to really embed the practices into the classrooms (CS1FG2)

Other suggestions were for additional examples, such as

I would also like to add to your Practice #3 example – Observe children interacting with space and letting the children engage in their own ways. It is important the teacher realises her value by staying out of the way of important play. You are affirming that child’s importance just by being there watching and perhaps documenting their important work. (CS7FG1)





Boulder Journey School infants room

OVERALL FINDINGS STAGES 1 AND 2

The two stages in the research project are very distinct. Stage 1 sought to ascertain and consolidate a range of perspectives about the synergies between the arts and sustainability education. Based on these perspectives, a series of recommendations that were appropriate for early childhood educators were developed and refined. This process generated the Principles, Reflections for *Econnection Pedagogies and Practices* that became the *IAPENE Handbook*. Stage 2 sought to trial the effectiveness of the *IAPENE Handbook* in six early childhood settings in Australia and one in the USA. Each of these two stages resulted in a series of findings as reported above.

In addition to the separate sets of findings for Stages 1 and 2, there are overall findings that reflect the engagement, practice and nuanced reflections of the participants in both stages. Whether they were educator participants who were engaged in both stages or participants in Stage 1 who contributed to the collective recommendations in the *IAPENE Handbook*, and therefore influenced the educators in Stage 2, their voices are part of these findings. The following points highlight the key themes that arose through Nvivo theme coding of transcripts, photostory analysis, children's artefacts and educator reflections.

1. There are strong synergies between the perspectives of sustainability educators and academics, artists, outdoor educators and early childhood educators with regard to the value, impact and importance of the natural world and the extent to which the arts can play a key role in accessing, understanding, interpreting and expressing *econnection* with the natural world.

This finding is unsurprising given the willingness of the participants to engage with the research. The value the participants attach to the arts for exploration, investigation and representation of experiences in the natural world is supported by many researchers and commentators including Eisner (2002), McArdle (2012), Inwood (2017) and Ward (2017a).

2. The arts provide a useful means of interpreting the natural world and making content about the natural world more accessible for inclusion in curriculum in early childhood.

The arts as a means of interpretation and understanding in early childhood is an under researched topic but the work of Somerville (2011), Curtis (2017) and Wilson (2010) validate one of the underpinning tenets of this research: that is, that metacognitive perception in the form

of primary experience, relived through arts experiences, provides ongoing opportunities for curriculum content and meaningful learning.

3. Interpretation of the natural world through the arts, when included in early childhood curriculum by educators, enhances the awareness of the local and regional natural environment on the part of the educators and the children.

Again, little research has been conducted in this area, although the work of Kiewra & Vaselack (2016), Tooth (2009) and Somerville (2011) support this contention by highlighting the value of deep reflection on features of flora and fauna and representing them through the arts. With experience, children develop a vocabulary to describe what is in their local natural environment, along with deep insights into what it is to move, sing, draw and imagine the animal, insect or habitat in question (Ward, 2018).

4. Engaging with the Principles, Reflections for *Econnection Pedagogies and Practices* included in the *IAPENE Handbook* results in a substantial increase in awareness and knowledge of the local natural environment for both children and educators.

The educators reported substantial enhancement to their awareness regarding their local natural environment. This was evident through the responses to questions about their engagement with and reflections on their environment, the children's play and use of descriptive language about the natural world and their artefacts. While not specifically focused on the arts, multimodal engagement with the natural world and the benefits of this are well documented by Elliot, Little and Wyver (2017a) and Chawla and Flanders Cushing (2007).

5. Practice suggestions in the *IAPENE Handbook* are immediately relatable to existing pedagogies in the educators' repertoires.

The Practice section of the *IAPENE Handbook* appealed to a number of the educators, particularly those who had limited time to engage with the overall document. It is likely that this is due to the immediate applicability of the Practices and the focus on outdoor play. It may also be due to the growing recognition of the importance of outdoor play and experiences (Little et al., 2017a), whether they be deliberately connected to the arts or not.

6. Educators working with the *IAPENE Handbook* reported that sense of place and belonging were positively effected

for both educators and the children with whom they worked.

There is considerable work that supports the importance of connection to place. Given the focus on the arts in deepening understandings of and connection to the natural world, it is no surprise that this resulted in a deepening of connection to place. Sandrine (2006) demonstrates the importance of ecological arts as does Inwood (2017) in denoting place and highlighting its key features.

7. Educators and children incorporating the *IAPENE Handbook* Principles, Reflections and Practices expressed new understandings about the nature of human/nature connection and interdependence.

Post-humanist engagement with the other than human world is an ongoing thread in these findings. The nature of the Stage 1 Principles and Reflections for *Econnection Pedagogies* in the *IAPENE Handbook* recognise the intra-active materiality of our engagement with the natural world (Rautio, 2013) and the ways in which this process is an embodied perception mediated through our senses and affective states of being (Hultman & Lenz Taguchi, 2010). The deepening of the connection, engagement and understandings of the natural world or other than human world that participants reported

in Stage 2 is also testament to this.

8. Where educators incorporated elements of the *IAPENE Handbook* in their program, cognitive problem solving and imagination were a focus for the children when engaging with natural phenomena and materials during their play and investigations

Educators working with the children in the trial sites for this research reported numerous incidents of creative and collaborative play with loose parts. The children's engagement with sustainability concepts was also evident through their investigations of insects, animals and plants. That the children asked many questions was not remarkable in itself. However, the fact that the questions they asked, the discussions they had and the insights they shared were focused on natural phenomena and natural world concepts was a result of the focus on the arts and the natural world as integrated curriculum (Ward, 2016). This creative approach to engaging with the natural world through the arts provides unlimited scope for content, exploration, representation and meaning making. With the imperative to find effective means for sustainable living on our planet, integration of the arts and sustainability curricula has a substantial contribution to make.

CONCLUSION

This research involved early childhood educators, preservice teacher academics, sustainability experts from the education and community sectors and artists in the development of a series of recommendations regarding integration of the arts and sustainability education. This resulted in the *IAPENE Handbook* which was then used by educators in seven early childhood settings in Australia the USA over a four-month period.

Using the *IAPENE Handbook*, the educators in this research investigated the plant and animal/insect species, the weather phenomena and landscapes in their local areas through a natural science inquiry approach. Educators engaged in opportunities for looking at the ways in which all of the elements in nature coexist as part of an integrated creative system and described this system through ecological narratives (story). They shared their experiences and insights with children in their respective groups and encouraged them to represent their understandings using creative arts modalities. This empowered the educators to enhance their own environmental knowledge using techniques with which they were already familiar: the arts.

The educators became artistic curators focusing on the other than human relationships in their immediate environments. They developed narrative adventures with key characters that exemplified engagement in habitat, lifecycles, social dynamics, and other relationships that denoted place. They identified and scaffolded the learning moments unearthed by the children, supporting them to deepen their investigation and to fan the flames of their curiosity and their capacity for creative problem solving about where they live and how they interact with the natural world.

This research found that combining sustainability learning with arts experiences helps our relationship with the components of the natural world to crystalize into an understanding of interconnected materials and living systems. It demonstrates that the well-known benefits of learning through the arts are enhanced further when arts media are used as a means of expression for place exploration and for creating scenarios that provide children with experiences of the animal, plant, and insect life of the area in which they live.

This research also highlights the value of time when engaging in new educational approaches. The educators' comments that they would have preferred up to a year to engage with the process and content involved in this program is telling. However, the depth of insight developed by the educators in this research about their local natural environments, enabled them to see, in more detail, elements of their environment they had not noticed previously and deepened their connection to place. To engage in such a focus for a longer period of time may well afford new insights into the synergies between the arts and sustainability learning.

As Johann Wolfgang von Goethe (Cited in Scharmer, 2017), poet, playwright, and scientist says: “Every object, well contemplated, opens up a new organ of perception within us.” This type of environmental exploration and expression of its content through the arts puts the ecological heart and soul into sustainability education, rendering it more likely that we will perceive humans as one species among many. Indeed, when we recognize ourselves as part of nature, in a state of *econnection*, we have a better chance of responding to the need for genuine coexistence.

Creative indoor play with natural elements



REFERENCES

Australian Curriculum Assessment and Reporting Authority. (2017). *Australian Curriculum. Cross-Curriculum Priorities: Sustainability*. Retrieved 10/12/2017, 2017

Australian Children's Education & Care Quality Authority. (2017). *NQF Snapshot Q3 2017*. Sydney: ACECQA.

Australian Children's Education and Care Quality Authority (ACECQA). (2016). *Guide to the National Quality Standard*. ACT: Australian Government.

Berman, M., G., Jonides, J. & Kaplan, S. (2008). The Cognitive Benefits of Interacting with Nature. *Psychological Science*, 19(12), 1207-1212.

Bignante, E. (2010). *The Use of Photo-Elicitation in Field Research: Exploring Masai Representations and Use of Natural Resources*. Retrieved 26/11/2015, 2015, from <http://echogeo.revues.org/11622>

Carson, R. (1962). *Silent Spring*. Boston: Houghton Mifflin.

Chawla, L. & Flanders Cushing, D. (2007). Education for Strategic Environmental Behavior. *Environmental Education Research*, 13(4), 437-452.

Chawla, L., Keena, K., Pevec, I. & Stanley, E. (2014). Green Schoolyards as Havens from Stress and Resources for Resilience in Childhood and Adolescence. *Health & Place*, 28(0), 1-13. doi: <http://dx.doi.org/10.1016/j.healthplace.2014.03.001>

Clark, A. (2011). Breaking Methodological Boundaries? Exploring Visual, Participatory Methods with Adults and Young Children. *European Early Childhood Education Research Journal*, 19(3), 321-330. doi: 10.1080/1350293x.2011.597964

Corbin, J. & Strauss, A. L. (2008). *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory*. New York: Sage.

Creswell, J. (2007). *Qualitative Inquiry & Research Design: Choosing Among Five Approaches* (2nd ed.). Thousand Oaks, CA: Sage Publications.

Crutzen, P. J. & Ramanathan, V. (2000). The Ascent of Atmospheric Sciences. *Science (Washington)*, 290(5490), 299-304.

Curtis, D. (Ed). (2017). *Building Sustainability with the Arts: Proceedings of the 2nd National EcoArts Australis Conference*. Sydney: Cambridge Scholars Publishing.

Cutter-Mackenzie, A. & Edwards, S. (2006). Everyday Environmental Education Experiences: The Role of Content in Early Childhood Education. *Australian Journal of Environmental Education*, 22(2), 13-19.

Dadvand, P., Nieuwenhuijsen, M. J., Esnola, M., Fornis, J., Basagaña, X., Alvarez-Pedrerol, M. & Sunyer, J. (2015). Green Spaces and Cognitive Development in Primary School Children. *Proceedings of the National Academy of Sciences of the United States of America*, June 15, 1-6. doi: 10.1073/pnas.1503402112

Davis, J. M. & Pratt, R. (2005). The Sustainable Planet Project. *Every Child*, 11(4), 10 -11.

DEEWR. (2009). *The Early Years Learning Framework: Belonging, Being & Becoming*. Canberra: Council of Australian Governments.

Dowdell, K., Gray, T. & Malone, K. (2011). Nature and its Influence on Children's Outdoor Play. *Australian Journal of Outdoor Education*, 15(2), 24-35.

Dymont, J. E., Bell, A. C. & Lucas, A. J. (2009). The Relationship Between School Ground Design and Intensity of Physical Activity. *Children's Geographies*, 7(3), 261-267.

Edwards, C., Gandini, L. & Forman, G. (Eds.). (2011). *The Hundred Languages of Children: The Reggio Emilia Experience in Transformation*. Westport, USA: Greenwood Press.

Eisner, E. W. (2002). *The Arts and the Creation of Mind*. New Haven & London: Yale University Press.

Elliot, S. & Davis, J. (2009). Exploring the Resistance: An Australian Perspective on Educating for Sustainability in Early Childhood. *International Journal of Early Childhood*, 41(2), 65-77.

Fjørtoft, I. (2004). Landscape as Playscape: The Effects of Natural Environments on Children's Play and Motor Development. *Children, Youth and Environments*, 14(2), 21-44.

Gill, T. (2007). *Can I Play Out: Lessons From London Plays, Home Zones Project*. London: London Play.

Glaser, B. G. (1967). The Constant Comparative Method of Qualitative Analysis. In B. G. Glaser & A. L. Strauss (Eds.), *The Discovery of Grounded Theory: Strategies for Qualitative Research* (Chapter V). New York: Aldine DeGruyter.

Gray, D. (2014). *Doing Research in the Real World*. London: Sage.

Groundwater-Smith, S. (2008). Practitioner Researchers: Today's Children of Mother Courage. What Can We Learn From Them? Paper presented at the Keynote Address, *RIPPLE Conference Action Research and Professional Practice*, Charles Sturt University, NSW.

Hultman, K. & Lenz Taguchi, H. (2010). Challenging Anthropocentric Analysis of Visual Data: A relational Materialist Methodological Approach to Educational Research. *International Journal of Qualitative Studies in Education*, 23(5), 525-542. doi: 10.1080/09518398.2010.500628

International Union for Health Promotion and Education. (2009). *Achieving Health Promoting Schools: Guidelines for Promoting Health in Schools*. Cedex, France: IUHPE.

Inwood, H., Heimlich, J. E., Ward, K. S. & Adams, J. D. (2017). Environmental Arts. In A. Kudryavtsev & M. Krasny (Eds.), *Urban Environmental Education Review*. New York. Comstock Publishing Associates.

Inwood, H. & Jagger, S. (2104). *DEEPER: Deepening Environmental Education in Pre-Service Education Resource*. Toronto, Ca: Ontario Institute for Studies in Education and The Dr. Eric Jackman Institute of Child Study.

Judson, G. & Egan, K. (2012). Elliot Eisner's Imagination and Learning. *Journal of Curriculum & Pedagogy*, 9(1), 38-41. doi: 10.1080/15505170.2012.684845

Kaplan, S. (2001). Meditation, Restoration, and the Management of Mental Fatigue. *Environment and Behaviour*, 33(4), 480-506.

Kellert, S. (2012). *Birthright: People and Nature in the Modern World*. New Haven/London: Yale University Press.

Kierwa, C. & Vaselack, K. (2016). *Playing with Nature: Supporting Preschoolers’ Creativity in Natural Outdoor Classrooms’*. Lincoln, NE.: Dimensions Educational Research Foundation.

Knight, S. (2011). *Risk and Adventure in Early Years Outdoor Play: Learning from Forest Schools*. London: Sage.

Kolbe, U. (2005). *It’s Not a Bird Yet: The Drama of Drawing*. Byron Bay NSW: Peppinot Press.

Little, H. (2017). Risk-Taking in Outdoor Play: Challenges and Possibilities. In H. Little, S. Elliot & S. Wyver (Eds.), *Outdoor Learning Environments: Spaces for Exploration, Discovery and Risk-Taking in the Early Years* (pp. 19-38). Crows Nest: Allen & Unwin.

Little, H., Elliot, S. & Wyver, S. (2017a). Why do Outdoor Play and Learning Matter? In H. Little, S. Elliot & S. Wyver (Eds.), *Outdoor Learning Environments: Spaces for Exploration, Discovery and Risk-Taking in the Early Years* (pp. 1-18). Crows Nest: Allen & Unwin.

Little, H., Elliot, S. & Wyver, S. (Eds.). (2017b). *Outdoor Learning Environments: Spaces for Exploration, Discovery and Risk-taking in the Early Years*. Sydney: Allen & Unwin.

Louv, R. (2006). *Last Child in the Woods: Saving Our Children from Nature Deficit Disorder*. Chapel Hill: Algonquin Books of Chapel Hill.

Malone, K. (2007). The Bubble-wrap Generation: Children Growing up in Walled Gardens. *Environmental Education Research*, 13(4, September 2007), 513-527.

Malone, K. (2013). *Child Friendly Bolivia: Research with Children in La Paz, Bolivia*. Centre for Educational Research: University of Western Sydney.

Malone, K., Dimoulas, K., Truong, S. & Ward, K. (2014). *Researching Children’s Designs for a Child Friendly Play Space at Rouse Hill Town Centre*. Centre for Educational Research: University of Western Sydney.

Malone, K. (2018). *Children in the Anthropocene: Rethinking Sustainability and Child Friendliness in Cities*. London: Palgrave Macmillan

McArdle, F. (2012). The Visual Arts: Ways of Seeing. In S. Wright (Ed.), *Children, Meaning Making and the Arts* (2nd Edition ed.): Pearson.

McConaghy, R. (2008). Designing Natural Play Spaces: Processes. In S. Elliot (Ed.), *The Outdoor Play Space Naturally: for Children Birth to Five Years* (pp. 27-42). Castle Hill: Pademelon Press.

McDuff, P. (2001). Story Magic. *Education Views, February*(2001), 9.

Orr, D. W. (2005). Place and Pedagogy. In M. Stone & Z. Barlow (Eds.), *Ecological Literacy: Educating our Children for a Sustainable World* (pp. 85-95). San Francisco: Sierra Club Books.

Osgood, J. (2006). Deconstructing Professionalism in Early Childhood Education: Resisting the Regulatory Gaze. *Contemporary Issues in Early Childhood*, 7(1), 5–14.

Phelan, L., McBain, B., Ferguson, A., Brown, P., Brown, V., Hay, I., Taplin, R. (2015). *Learning and Teaching Academic Standards Statement*

for environment and Sustainability (Office for Learning and Teaching, Trans.). Sydney.

Ponte, P., Ax, J., Beijgaard, D. & Wubbels, T. (2004). Teachers' Development of Professional Knowledge Through Action Research and the Facilitation of this by Teacher Educators. *Teaching and Teacher Education*, 20(6), 571-588.

Rautio, P. (2013). Children Who Carry Stones in Their Pockets: On Autotelic Material Practices in Everyday Life. *Children's Geographies*. doi: 10.1080/14733285.2013.812278

Roszak, T. (2001). *The Voice of the Earth: An Exploration of Ecopsychology* (2nd Ed.). Grand Rapids MI: Phanes Press Inc.

Royal Botanic Gardens. (2017). Community Greening. Retrieved 03/12/2017, 2017, from <https://www.rbgsyd.nsw.gov.au/learn/community-greening>

Sandrine, S. (2006). Systemic Educational Approaches to Environmental Issues: The Contribution of Ecological Art. *Systemic Practice and Action Research*, 19(2), 143-157.

Schutte, A. R., Torquati, J. C. & Beattie, H. L. (2017). Impact of Urban Nature on Executive Functioning in Early and Middle Childhood. *Environment and Behavior*, 49(1), 3-30.

Siraj-Blatchford, I, Taggart, B., Sylva, K., Sammons, P. & Melhuish, E. (2008). Towards the Transformation of Practice in Early Childhood Education: The Effective Provision of Pre-school Education (EPPE) Project. *Cambridge Journal of Education*, 38(1), 23 - 36.

Sobel, D. (2005). *Place-Based Education: Connecting Classrooms and Communities*. Great Barring MA: The Orion Society.

Somerville, M. (2011). Becoming Frog: Learning in Place in Primary School in *Place, Pedagogy, Change* (pp. 65-80). Rotterdam: Sense Publishers.

Somerville, M. (2012). The Critical Power of Place. In G. S. Cannella & S. Steinberg (Eds.), *Critical Qualitative Research Reader* (pp. 67-81). New York: Peter Lang.

Somerville, M. (2013). *Water in a Dry Land: Place Learning Through Art and Story*. New York: Taylor and Francis.

Somerville, M. (2016). The Anthropocene’s Call to Educational Research. In K. Malone, Gray, T., Truong, S. (Ed.), *Reimagining Sustainability in Precarious Times* Melbourne: Springer.

Suzuki, D., McConnell, A. & DeCambra, M. (2003). *The Sacred Balance: A Visual Celebration of Our Place in Nature*. Vancouver: Greystone Books.

Taylor, A. & Kuo, F.E. (2006). Is Contact with Nature Important for Healthy Child Development? State of the Evidence. In C. Spencer & M. Blades (Eds.), *Children and their Environments*. Cambridge: Cambridge University Press.

Tooth, R. & Renshaw, P. (2009). Reflections on Pedagogy and Place: A Journey Into Learning for Sustainability Through Environmental Narrative and Deep Attentive Reflection. *Australian Journal of Environmental Education*, 25, 95-104.

Torquati, J. Gabriel, M. M., Jones-Brand, J. & Leeper-Miller, J. (2010). Environmental Education: A Natural Way to Nurture Children’s Development and Learning. *Young Children*, November, 98-105.

Tranter, P. (2006). Overcoming Social Traps: A Key to Creating Child Friendly Cities. In B. Gleeson & N. Snipe (Eds.), *Creating Child Friendly Cities: Reinstating Kids in the City* (pp. 121-135). New York: Routledge.

Tranter, P. & Sharpe, S. (2008). Escaping Monstropolis: Child-friendly Cities, Peak Oil and Monsters Inc. *Children's Geographies*, 6(3), 295-308.

Wang, C. (2008). Youth Participation in Photovoice as a Strategy for Community Change. *Journal of Community Practice*, 14(1-2), 147-161.

. Ward, K. (2011). 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. *College of Arts: Social Justice Social Change Research Group, Doctor of Philosophy*, Western Sydney University.

Ward, K. (2016). The Natural World as Content for Interconnection and Divergence of Pretense and Storytelling in Children's Play. In S. Douglas & L. Stirling (Eds.), *Children's Play, Pretence, and Story: Studies in Culture, Context, and Autism Spectrum Disorder* New York: Psychology Press.

Ward, K. (2017a). *Inquiry Arts Pedagogy and Experiential Nature Education Handbook*. Centre for Educational Research. Western Sydney University. Bankstown.

Ward, K. (2017b). Beyond Sustainability – Visions of Post-humanist E-connection in Early Childhood Education. In K. Malone, T. Gray & Truong. (Eds.), *Reimagining Sustainability in Precarious Times*. (pp. 129-142) Melbourne: Springer.

Ward, K. (2018). Singing in the Forest: Outdoor Education as Early Childhood Curriculum. In T. Gray & D. Mitten (Eds.), *The Palgrave International Handbook of Women and Outdoor Learning*. London: Palgrave Macmillan

Wattchow, B. & Brown, M. (2011). *A Pedagogy of Place: Outdoor Education for a Changing World*. Clayton: Monash University Publishing.

White, R. & Stoecklin, L. (2008). Nurturing Children's Biophilia: Developmentally Appropriate Environmental Education for Young Children. Retrieved 27/5/2010, 2010, from <http://www.whitehutchinson.com/children/articles/nurturing.shtml>

Wilson. E.O. (1984). *Biophilia*. Cambridge, Massachusetts: Harvard University Press

Wilson, R. (2010). Aesthetics and a Sense of Wonder. *ChildCare Exchange, May/June, 27-27*.

Wright, S. (2012). *Children, Meaning-Making and the Arts*. Frenchs Forest: Pearson.

Wyver, S., Tranter, P., Naughton, G., Little, H., Sandseter, E. & Bundy, A. (2010). Ten Ways to Restrict Children's Freedom to Play: The Problem of Surplus Safety. *Contemporary Issues in Early Childhood*, 11(3), 263-277.

APPENDIX 1: INTERVIEW SCHEDULE

Centre for
Educational Research
School of Education

Western Sydney University
Locked Bag 1797
Penrith NSW 2751
Australia

Email: k.ward@westernsydney.edu.au

Interview Schedule

Project Title: International Perspectives on Arts Pedagogies and Experiential Nature Education - The Art of Learning in Natural Play Spaces: Approval # H11092

What is the age group that you work with as an educator/academic/program leader?

In what kind of institution or organisation do you work?

How long have you been an educator/academic/program leader?

What subjects or topics do you teach?

In what ways did your pre-service education prepare you to teach education for sustainability?

What does the term education for sustainability mean to you?

Are there other terms you use? Yes ☐ No ☐

What are they?

To what extent does education for sustainability (or your equivalent) feature in your curriculum or program?

To what extent are outdoor experiences involved in your program of education for sustainability?

From where do you source teaching material for or information about education for sustainability?

What pedagogies or methods do you use to teach education for sustainability?

What do you hope your students will learn through your education for sustainability focus in the curriculum/program?

In what ways if any, are the arts involved when you teach about education for sustainability?

To what extent is the involvement of the arts intentional?

Why?

What do students learn when outdoor experiential education and arts-based experiences are interrelated?

Are there any specific theories that underpin your practice as an education for sustainability educator/program leader?

Yes ☐ No ☐ If so, what are they?

APPENDIX 2: REFLECTIONS ON PHOTOGRAPHS

Centre for
Educational Research
School of Education

Western Sydney University
Locked Bag 1797
Penrith NSW 2751
Australia

Email: k.ward@westernsydney.edu.au

Reflections on Photographs of Resources and Environments

Project Title: International Perspectives on Arts Pedagogies and Experiential Nature Education - The Art of Learning in Natural Play Spaces: Approval # H11092

Notes on submitting photographs:

Please put your name and a number on the file name of the photographs for easy recognition, i.e Ward Photo 1

Please upload all 6 photographs in both the resources and environments categories to Dropbox via the link sent to you. This means 12 photographs in total. No one else will be able to see your photographs.

In your responses to questions 1 and 2, please indicate which photographs you have chosen.

Photographs chosen: Resources

Considering the 6 photographs you took, why did you choose the 3 photographs showing your resources for education for sustainability?

Photographs chosen: Environments

Considering the 6 photographs you took, why did you choose the 3 photographs showing your environments for education for sustainability?

What do these chosen photographs say about the engagement of arts in education for sustainability?

What do these chosen photographs indicate about your practice as an educator for sustainability?

APPENDIX 3: FOCUS GROUP QUESTIONS

Centre for
Educational Research
School of Education

Western Sydney University
Locked Bag 1797
Penrith NSW 2751
Australia

Email: k.ward@westernsydney.edu.au

Focus Group Questions (asked in situ and recorded or by method outlined below)

Dear Educators,

The end of the year has come around quickly and I take this opportunity to thank you for your involvement in the IPAENE study. Your dedication to excellence and to making the world a better place for our children and our communities is extraordinary. This final group of questions will round off the research data collection process and I look forward to sharing the final report with you later in 2017.

Please feel free to put each question on a separate piece of paper and pass each sheet to all members of your team so that we have a group response for each question.

1. What is your overall impression about the usefulness of the IAPENE pedagogical tool with the Principles, Reflections and Practices?
2. Can you tell me about how you used the document in your work with the children?
3. What were the Principles, Reflections or Practices that resonated most with you and that you considered when scaffolding of the children's interactions with the natural environment, and why?
4. What were the least useful aspects of the IAPENE pedagogical tool?
5. In what ways did your engagement in this study add to or complement your existing focus on sustainability education?
6. What did you learn about your local natural environment over the course of the study?
7. What do you think the children learned about the local natural environment and about their 'place' as a result of their engagement in the study?
8. In what ways did the children's language incorporate new understandings about the natural world and their 'place' during the course of the study?
9. In what ways did the children's play incorporate new understandings about the natural world and their 'place' during the course of the study?
10. In what ways did the children's artistic expression/artefacts reflect new understandings about the natural world and their 'place' during the course of the study?

Thank you so much for your expertise, your engagement and your time.

Yours collegially

Kumara Ward



Pattern making in the forest