WHAT ARE YOU DOING OUTSIDE?  
A CASE STUDY OF OUTDOOR TEACHING

MASTER OF EDUCATION

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2014

Submitted in fulfilment of the requirements for the degree of  
Master of Education (Coursework by Research)  
Supervisor: Associate Professor Deborah Heck
Keywords

Case study, Education for Sustainability, Environment as an Integrating Context, experience-based learning, interdisciplinary curriculum, school garden, school grounds, teaching outdoors.
Abstract

This case study investigated the process of teaching outdoors in a primary school. Data collection from 15 participants included a written survey and a follow-up interview providing examples of outdoor teaching practice. Thematic coding was used to categorise data concerning the school’s setting and educators’ practice in response to their physical and social context. The Environment is used as an Integrating Context (EIC), seamlessly integrating indoor learning with outdoor experiences to enhance student engagement and motivation. Educators report that outdoor teaching activities using experience-based learning strategies engage all students in learning across the curriculum, reduce misbehaviour and foster environmental learning and skills. Involvement in the kitchen garden project has prompted educators to regularly venture outdoors to teach across the curriculum. The Principal’s enabling leadership has resulted in a supportive culture amongst educators, and the allocation of resources to continually improve the green school grounds and fund the kitchen garden project. Education for Sustainability principles and teaching strategies are evident in the regular outdoor learning activities conducted at this school. Teaching outdoors has considerable potential to facilitate primary school curriculum delivery, particularly EfS. The research findings provide practical support for the delivery of the Australian Curriculum’s cross-curriculum priorities through EIC and outdoor teaching. Application of this research methodology to other school ground settings will contribute further to knowledge regarding the practical process of teaching outdoors and EfS.
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List of Abbreviations

AuSSI – Australian Sustainable School Initiative
EfS - Education for Sustainability
EE - Environmental Education
EIC – Environment as an Integrating Context
O&EECs - Outdoor & Environmental Education Centres
UNDESD – United Nations Decade for Sustainable Development
WSS - Whole School Sustainability
Statement of Original Authorship

The work contained in this thesis has not been previously submitted to meet requirements for an award at this or any other higher education institution. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made.

Signature: _________________________

Date: _________________________
Acknowledgments

The author would like to acknowledge the support and assistance of her supervisor, Associate Professor Deborah Heck, in the completion of this research journey. The enthusiastic participation of the staff at Apple State School was very much appreciated, thank you for letting me tell your outdoor teaching story. Lastly, the never-ending patience of my family has allowed me the opportunity to follow my passion for teaching and learning outdoors – I am forever grateful.
1. Introduction

This research aims to examine the process of teaching outdoors in school grounds to support both curriculum delivery and the objectives of Education for Sustainability. The research is in response to the challenge of teaching sustainability in schools as the United Nations Decade for Education for Sustainable Development [UNDESd] 2005-2014 concludes (UNESCO, 2005). In line with Australia’s international commitments, sustainability education has been promoted in the National Action Plan for Sustainability, Living Sustainably (Australian Government, 2009) and included as a cross-curriculum priority in the Australian curriculum by the Australian Curriculum Assessment and Reporting Authority (ACARA, 2011). This introduction will outline the background to the research in Section 1.1. Section 1.2 will discuss the context of this particular research study. The overall aims of the study are given in Section 1.3, and the significance and limitations of the research will be explained in Section 1.4. Finally, the thesis overview in Section 1.5 will outline the layout of the project report.

1.1 BACKGROUND

This section describes the background to the study through examining the current status of sustainability education in Australian schools. Environmental education and sustainability have been an explicit educational policy goal in Australia for more than 15 years. In 1999, the Ministerial Council on Education, Employment, Training and Youth Affairs included Goal 1.7 in their goals for schooling, stating that when students leave schools they should: “have an understanding of, and concern for, stewardship of the natural environment, and the knowledge and skills to contribute to ecologically sustainable development” (Ministerial Council on Education Employment Training and Youth Affairs, 1999). Sustainability is a complicated concept and difficult to teach (Evans, Whitehouse, & Gooch, 2012; Kennelly, Taylor, & Serow, 2012a) and it is unlikely that students will acquire the knowledge and skills that promote ecologically sustainable behaviours without significant educational change.
The Australian Curriculum positions sustainability as a cross-curricular priority, to be included across subject disciplines and throughout school life in order to produce active environmental citizens (ACARA, 2011). Sustainability education requires a new approach to teaching practice to incorporate school sustainability activities and interdisciplinary learning, and this challenges traditional teaching methods and strategies (Australian Government, 2011; Skamp, 2009a).

Sustainability education is a relatively new and complex concept that is not mandatory in Australian teacher pre-service programmes, leading to a lack of confidence in educators to teach it (Kennelly, Taylor, & Serow, 2012b). The cross-curriculum documents include explicit sustainability education outcomes, termed the Organising Ideas of Sustainability (ACARA, 2013), however potential links to sustainability are simply indicated by a leaf symbol within subject documents and not connected to sustainability content. Links are considered critical due to educators’ lack of experience with teaching sustainability in schools, and the absence of links reduces the chance of sustainability being included when educators plan. The recent government review of the Australian Curriculum concurs that the cross-curriculum priorities need further clarification (Australian Government, 2014). There is no reference to sustainability in the Australian Professional Teaching Standards, thus beginning teachers have little motivation to include sustainability into their professional practice as they progress to full teacher registration (Australian Institute for Teaching and School Leadership, 2012). Teaching sustainability poses practical issues for educators in addition to the lack of explicit support for its inclusion in professional and curriculum documents. In practice, very little has been done to support the implementation of cross-curriculum sustainability in classrooms (Kennelly, et al., 2012a).

The objective of sustainability education is to develop citizens who live more sustainably: “not simply the acquisition of knowledge or skills, but a total approach which generates motivation and commitment to take environmental action” (Australian Government, 2009, p. 8). This action taking approach or “Education for Sustainability” (EfS) is both more ambitious and more ambiguous than environmental education, as it includes the three pillars of socio-cultural, economic and environmental sustainability. EfS is to be sited within “the broader context of socio-cultural factors and the socio-political issues of equity, poverty, democracy and quality of life” (UNESCO, 2004, p. 16). The inclusion of socio-political and
economic factors leads to a definition of EfS that is so broad that its’ conceptualisation by educators and implementation in schools is problematic (Gough, 2007). EfS includes content that is not typically taught in the school curriculum to be taught in a non-traditional way; using experience-based learning about interdisciplinary content with real world actions, rather than traditional teacher-led instruction.

Traditionally, school subjects are taught in isolation using transmission modes of delivery from the teacher as expert to the learner as novice. Although teacher-led strategies may be sufficient for lower level learning such as content recall, higher order thinking skills, including analysis, synthesis and evaluation, are promoted through active learning and engagement. The pedagogies or teaching strategies that support effective EfS include participatory, inquiry-based, real-life learning strategies in the local environment that are integrated with traditional subject knowledge and systems understandings (Payne, 2006; Rickinson et al., 2004; Skamp, 2009a). Interdisciplinary, multidimensional and emotional learning promote ecological and human systems understandings and help develop positive attitudes and motivation in learners (Eilam & Trop, 2010). Active learning requires the learner to be actively engaged with the topic, constructing their own meaning and understanding from their experiences and observations. This constructivist learning approach, where the learner actively constructs knowledge in response to solving problems or investigating real issues, is widely promoted within sustainability education documents (Australian Government, 2010; UNESCO, 2005) and will be discussed further in Chapter 2.

In the early 21st century, as part of the implementation of the UNDESD, the Australian government commissioned a series of reviews into how sustainability was delivered. The Australian Research Institute in Education for Sustainability (ARIES) undertook a National Review into Environmental Education and its contribution to sustainability in Australia, with the results published in several volumes in 2004 and 2005 (Henderson & Tilbury, 2004; Tilbury, Coleman, & Garlick, 2005; Tilbury & Cooke, 2005). Comprehensive reviews of sustainability education (Tilbury, et al., 2005) and whole school approaches to sustainability (Henderson & Tilbury, 2004) supported the Australian Government funding of the Australian Sustainable Schools Initiative (AuSSI) until mid-2012. AuSSI is a whole-school sustainability approach that involves the adoption of sustainable practices in all aspects of school business;
school management processes, school buildings and grounds, procurement and waste, and to incorporate sustainability into the curriculum (Australian Government, 2011; Henderson & Tilbury, 2004). Sustainable school practices provide an opportunity for children to interact with their local environment over a long period and allow learners to deeply understand their place in the world, often while fostering links to their local community. Whole-school sustainability approaches may be effective in promoting action taking behaviours and developing environmental attitudes in learners, especially when sustainability is integrated across and through curriculums (Eilam & Trop, 2010; Henderson & Tilbury, 2004; Skamp, 2009a; Steele, 2011). Unfortunately, AuSSI’s implementation has tended to focus on school-wide environmental actions rather than the integration of the three pillars of sustainability across and through curriculums, leading to a missed opportunity for EfS (Gough, 2005).

There is a large body of research on the difficulties of incorporating environmental and sustainability education into the Australian school curriculum (Evans, et al., 2012; Heck, 2003; Kennelly, et al., 2012a). Evaluative reviews of sustainable schools internationally have consistently reported that although schools may operate more sustainably, EfS is rarely incorporated across and through the curriculum (Scott, 2009). The relationship between environmental knowledge, skills, attitudes and behaviour is complicated, and knowledge or skills alone rarely lead to action taking (Clarke, 1996; Fien, Ai, Yencken, Sykes, & Treagust, 2002; Kollmuss & Agyeman, 2002; Nagel, 2004; Nagel & Lidstone, 2008). Performing isolated sustainable actions without knowledge integration of ecological and human systems reduces the opportunity for students to develop deeper understandings and foster environmental empathy (Nagel & Lidstone, 2008).

Many factors affect the complex understandings, feelings and skills needed for environmental-action taking to occur (Eilam & Trop, 2010). Factors that have been found to influence environmental behaviours and intentions include gender, socioeconomic status, duration of environmental programmes, environmental knowledge and environmental attitudes (Rickinson, 2001). People may act environmentally without full knowledge of an issue or have complex understandings of what is occurring and what could be done but no motivation or capability to act sustainably. The Australian Government’s Sustainability Curriculum Framework (2010) provides a model for conceptualising the teaching and learning approaches
found to be effective in promoting environmental action-taking behaviours, and will be discussed in Section 2.1.1. Experiences with nature are often cited as a reason for adopting environmental behaviours in adults, as well as supporting ecological and human systems understandings in children (Gill, 2011).

Engagement with the natural environment is considered a necessary foundation for the development of the environmental empathy and attitudes that encourage motivation for environmental action taking (Aguilar, Waliczek, & Zajicek, 2008; Chawla & Flanders Cushing, 2007; Gill, 2011). Unfortunately, there is growing concern that children now have fewer opportunities to engage with natural environments due to the increasing use of technology, time taken up by organised sport and leisure activities, and parental safety concerns with children’s unsupervised play outdoors (Dyment, 2005b; Louv, 2005; Waite, 2010). Schools are being called upon to provide opportunities for children to engage with nature, both for free play and directed learning within their local environment (Dyment, 2005b; Malone & Tranter, 2003b). Outdoor learning and experiences are also central to the development of effective EfS understandings in children (Ballantyne & Packer, 2008; Palmberg & Kuru, 2000; Rickinson, 2001; Skamp, 2009a). “Greener” school grounds provide a potential solution to both facilitate frequent nature experiences and allow learners to engage in meaningful and productive EfS through the process of greening projects and learning outdoors. There is a considerable amount of research evidence regarding the academic, social and health benefits from outdoor learning (Blair, 2009; Rickinson, et al., 2004; Robinson & Zajicek, 2005). However, studies have also reported that teachers find common barriers to taking classes outside regularly (Allison, Carr, & Meldrum, 2012; Dyment, 2005b; Simmons, 1998; Tal & Morag, 2009).

There are several initiatives in the USA and Canada to beautify school grounds and facilitate nature experiences at school, such as the “Boston Schoollyard” and “Evergreen” (Malone & Tranter, 2003a; Steele, 2011). Green school grounds offer outdoor learning experiences that may address several of the key barriers to excursion-based outdoor environmental education. School gardens and green spaces can provide frequent and repeated nature experiences, and facilitate both informal and formal outdoor learning in nature. School grounds also provide sites for student-initiated projects to improve the natural environment and implement Whole School Sustainability interventions such as planting trees, water saving and waste
management initiatives (Cronin-Jones, 2000; Malone & Tranter, 2003b). School ground projects, sometimes termed learnscapes, support the development of community links and understandings of the economic and social issues that impact environmental decision-making. The factors that support and hinder school ground projects will be discussed in Section 2.2.2.

Educators are often reluctant to venture outdoors to teach, despite being aware of the many benefits for learners from outdoor learning (Dyment, 2005b; Kenney, Militana, & Donohue, 2003). These barriers to teaching outdoors are significant and include: limited environmental knowledge and resources, class management issues, lesson preparation issues, difficulty with activity selection, and student safety concerns (Dyment, 2005b; Gough, 2004; Rickinson, et al., 2004; Skamp, 2009b). Learning outdoors tends to decline as children progress through school, and even in countries like the United Kingdom with explicit outdoor teaching policies, there are concerns regarding the declining quality and quantity of outdoor learning (Waite & Pleasants, 2012). Schoolyards offer potential sites for outdoor teaching and learning that may address some of these barriers to learning outdoors and support teachers to provide outdoor learning in natural environments (Carrier Martin, 2003; Dyment, 2005b; Malone & Tranter, 2003a; Skamp & Bergmann, 2001).

Education for Sustainability (EfS) requires children to regularly engage with nature, understand the complex relationships between humans and the environment, and learn the practical skills needed to make sustainable environmental decisions in imagined futures. Achieving the action-taking goals of EfS is a daunting agenda, however by adopting a whole-school approach to sustainability, the complexity of EfS can be framed within an authentic local context. Teaching outdoors supports an interdisciplinary approach to understandings about sustainability and human impacts on the natural environment. Outdoor learning activities are interdisciplinary and may support the integration of sustainability as a cross-curriculum priority in Australian schools.

This research seeks to examine the process of teaching outdoors as a means to align the theory and evidence regarding effective EfS more closely with teachers’ practice. Little is known about how teachers plan and integrate regular outdoor learning activities to support curriculum delivery (Skamp, 2009a). It is envisaged that
through an in-depth examination of this case, understandings about the practical process of teaching outdoors in school grounds will be enhanced. Understanding this process may support educators to teach sustainability in schools more effectively by regularly venturing outside of the classroom.

1.2 CONTEXT

Outdoor teaching in school grounds was chosen as the research focus because while it clearly supports cross-curriculum sustainability, it is commonly reported as problematic for teachers. The research will qualitatively report upon the process of teaching outdoors in a school with regular outdoor learning. The findings will assist educators to reflect upon their own outdoor teaching strategies to support student learning outcomes and the delivery of sustainability within the curriculum.

Teaching outdoors in school grounds supports active EfS through the meaningful integration of practical behaviours for sustainability with interdisciplinary learning about the local environment and understandings about the connections between human and ecological systems (Henderson & Tilbury, 2004; Skamp & Bergmann, 2001). The potential of school ground learning for EfS goes beyond the environmental practices that commonly occur in whole-school sustainability (Australian Government, 2010; Birdsall, 2010; Scott, 2009). School ground learning activities allow for wider exploration of the socio-cultural and economic pillars of sustainability, as learners consider the financial and socio-cultural impacts of environmental projects on the school and the wider community. Outdoor teaching for sustainability can be framed within the Sustainability Curriculum Framework’s Sustainability Action Process whereby learners investigate a real issue, consider the values, perspectives and future impacts of their proposed solutions, implement actions and evaluate their success or failure (Australian Government, 2010).

1.3 RESEARCH QUESTIONS

The primary purpose of the research is to investigate how educators use outdoor teaching activities to support curriculum delivery. The overarching research question is “how is outdoor teaching used at this primary school?” Other research questions include: “how and why do teachers plan outdoor learning?” and “does outdoor
teaching support the goals of education for sustainability and broader curriculum delivery?” The process of teaching outdoors in school grounds was the primary focus, since this had not been previously reported in the literature. The outdoor teaching strategies used in school grounds were compared to the pedagogies and activities used in fieldwork (Ballantyne & Packer, 2008). Teachers’ level of use of outdoor teaching was established to evaluate their adoption of this educational strategy (Skamp, 2009b), with examples from the data on how educators integrate outdoor teaching with their class curricula. Thus the research outlined the planning and teaching strategies, activities and beliefs regarding teaching and learning outdoors in school grounds.

1.4 SIGNIFICANCE AND LIMITATIONS

This research contributes significantly to the gap between environmental education theory and practice in Australian schools by investigating educators’ use of outdoor teaching activities and the process of teaching outdoors in school grounds. The study addresses the shortage of research on environmental learning processes, or the “how”, as opposed to environmental learning outcomes, or the “what” (Rickinson, 2001). The research is expected to highlight the potential for outdoor teaching activities to promote student learning and good pedagogy, whilst supporting interdisciplinary curriculum delivery and the objectives of EfS.

The case study approach allowed participating educators to benefit from reflecting upon teaching outdoors and experience-based learning strategies. It provides an opportunity for professional reflection upon teaching outdoors in school grounds and consideration of the strategy’s use, both personally and within this school. Although the data collected is specific to this one case, reporting on the situation at this school may allow other educators to reflect upon their teaching practice.

Although data is specific to this case and not widely generalisable, deep examination of a case of best practice enables other educators to understand how outdoor teaching is used in a particular school setting. The methodology may be applied to other settings in the future, to broaden understandings of teaching outdoors in other school environments. Readers may draw their conclusions and apply other theoretical frameworks to the original data presented in the research findings. The
discussion of educators’ beliefs regarding teaching outdoors may help readers to reflect upon their understandings and use of outdoor teaching as a teaching strategy.

This enquiry into the process of teaching outdoors evaluates what is taught outdoors, and the teaching strategies used. A comparison will be made between the pedagogies promoted in the EfS literature, the experience-based learning strategies used in field trips and how outdoor teaching is used within this school setting. The findings may assist the planning of teacher professional development resources and address pre-service teacher education requirements, which in turn may support the practical implementation of EfS in schools. This research fills a gap in the literature concerning outdoor teaching pedagogies and aligns EfS theory with practice.

1.5 THESIS OVERVIEW

Chapter 2 provides a review of the literature regarding teaching outdoors in school grounds. The chapter will be divided into 3 sections: Section 2.1 reviews the research on effective EfS; Section 2.2 examines the research literature on teaching outdoors; and Section 2.3 discusses the limited research on how and what educators teach outdoors. Chapter 3 explains the research methodology and methods used for data collection and analysis in this case study. The methodology explains the researcher’s theoretical perspective and justify why a qualitative case study paradigm was adopted for this enquiry.

Chapter 4 and Chapter 5 report the findings of the research, including discussion and analysis of the findings as compared to previous studies. The research findings are divided into two chapters: Chapter 4 concerns the case setting; and Chapter 5 concerns the participants’ practice in this case. The research findings will outline how educators incorporate regular outdoor teaching in this setting, and the perceived educational benefits. The researcher’s conclusions from the research investigation are presented in Chapter 6. This final section will clarify how outdoor teaching is used at this school and how it may support cross-curriculum learning and EfS. The implications of the study and further recommendations conclude the thesis.
2. Literature review

This chapter will review the literature on the pedagogies that support successful Education for Sustainability and outdoor teaching. Section 2.1 outlines the characteristics of effective EfS. Section 2.2 examines how outdoor teaching is used in schools; and Section 2.3 outlines the process of teaching outdoors. Section 2.4 highlights the implications from the literature impacting on this study.

2.1 EFFECTIVE EDUCATION FOR SUSTAINABILITY

Section 2.1 will firstly examine the theory underlying the teaching of Education for Sustainability by outlining the principles of EfS and the literature concerning EfS programmes that develop learners’ knowledge about sustainability, positive environmental attitudes and promote action. The literature evaluating successful EfS programmes will be reviewed in Section 2.1.2. Section 2.1.3 will examine the evidence regarding significant nature experiences supporting the affective and transformational objectives of EfS. This analysis provides the foundation for the examination of teaching outdoors in Section 2.2.

2.1.1 PRINCIPLES OF EF S

Knowledge about sustainability does not embody empirical, objective knowledge; on the contrary it is constructivist: subjective, problematic and personal. If sustainability knowledge is socially constructed from the learner’s active participation in the production and verification of meaning, Stevenson (2007) points out there is a large gap and contradiction between the theory of learning and practice in schools. In 1977, the United Nations (UNESCO) environmental education conference declared in Tbilisi:

the basic aim of environmental education is to succeed in making individuals and communities understand the complex nature of the natural and the built environments resulting from the interaction of their biological, physical, social, economic, and cultural aspects, and acquire the knowledge, values, attitudes, and practical skills to participate in a responsible and effective way in anticipating and solving environmental problems, and in the management of the quality of the environment (UNESCO, 1978, p. 1).
A constructivist framework for teaching sustainability was subsequently developed by Ballantyne and Packer (1996), and proposed developing ecological knowledge in conjunction with understandings of alternative perspectives while motivating students and increasing their capacity to implement sustainability actions. Ballantyne and Packer’s (1996) EfS framework included: developing understanding about alternative environmental conceptions; exploring the knowledge and perspectives underlying these conceptions; and enhancing capacity to act sustainably through planning and practicing real environmental skills and actions. This approach to teaching EfS has been well supported in the research literature and international policies regarding sustainability education for decades, and is evident in the international and Australian documents for the implementation of the UNDESD (Australian Government, 2009; UNESCO, 2004).

The principles for teaching EfS encompass interdisciplinary learning about sustainability and encourage action taking within the school and local community environment, supporting the implementation of AuSSI with the new curriculum. They embody the transformational objectives of sustainability through embracing democratic, capacity building education for individual and societal change for sustainability. In their ARIES review, Tilbury and Cooke (2005) summarised the principles of EfS as:

- Transformation and change
- Systems thinking
- Envisioning a better future
- Critical thinking and reflection
- Participation
- Partnerships for change.

These principles are commonly used to frame EfS teaching in the literature, government education documents and whole school approaches to sustainability (ACARA, 2013; Australian Government, 2011; Skamp, 2009a).

The principles of EfS require a constructivist approach to teaching and learning for sustainability. Transformation and change involves a new conceptualisation of sustainability education beyond schools; it requires lifelong learning for people of all ages and backgrounds within all possible learning spaces, in the classroom, local area and beyond. Systems’ thinking requires interdisciplinary
understanding of the connections between the environmental, economic, social and political systems. Discipline knowledge must not be taught in isolation, but be integrated across disciplines to support understandings of the complex relationships between human and ecological systems. Envisioning a better future is the key difference between EfS and environmental studies. Multidimensional learning by applying concepts to different places or across different times supports understandings of cause and effect, and allows real problem-solving skills to be applied to issues of sustainability.

Critical thinking and reflection on personal experiences and world-views are necessary to understand alternative perspectives before developing sustainable action plans that may challenge current interpretations. Participation is essential to develop ownership of action taking projects and impact sustainability on a scale that causes a larger positive effect. The success of participants’ planned and delivered action is motivating and further equips their capacity to act sustainably. Partnerships for change involve the development of community networks for sustainability, supporting communication and relationships across different sectors of society, and supporting local businesses and governments to incorporate sustainability practices. The constructivist approach evident in these principles of EfS provides the foundation for whole-school approaches to sustainability (Henderson & Tilbury, 2004; UNESCO, 2005) and supports the implementation of AuSSI over the past decade (Australian Government, 2011).

Skamp’s (2009a) critical review of EfS examined how sustainability is successfully taught and the evidence for such constructivist approaches. The Sustainability Curriculum Framework [SCF] (Australian Government, 2010) further clarified the EfS approach to pedagogy for curriculum developers and educators to support the inclusion of sustainability as a cross-curriculum priority from 2012. The SCF models an integrated approach to teaching sustainability (see Figure 1). It includes Knowledge of Human and Ecological Systems, in addition to Repertoires of Practice; such as world viewing, systems thinking, and futures and design thinking.
The central organiser of the framework is the Sustainability Action Process, since the acquisition of knowledge is of little benefit if it does not lead to action for sustainability. The Sustainability Action Process involves students collaboratively planning to address local sustainability issues through making a case for change, developing and implementing a proposal for a sustainability action. This process enables children to take real action for the environment and acquire the knowledge, attitudes, skills and abilities required to address future sustainability issues and take action to live more sustainably. The SCF may support curriculum planning for the integration of sustainability, however its’ existence has neither been widely promoted nor supported by professional development for educators (Kennelly, et al., 2012a). Thus, although constructivist approaches to curriculum are proposed to teach EfS, schoolteachers’ education and practice has not been supported to adopt such pedagogical changes. Section 2.1.2 will now examine the research evidence evaluating the characteristics of EfS programmes that successfully achieve change in sustainability knowledge, attitudes and behaviours in learners.

2.1.2 EVALUATION OF SUCCESSFUL EFS PROGRAMMES
Analysis of EfS programme evaluations reveals common factors that may influence learner outcomes. Rickinson and others (2001) conducted a comprehensive critical review of over 100 research articles on EfS in schools. They found that most research was conducted using quasi-experimental investigation into the effects of a short-term innovative strategy on students’ environmental knowledge, attitudes and behaviours.
The programmes which were shown to support independent environmental behaviours included residential field courses over several days; school-based sustainability activities (which improved attitudes but not knowledge); school-based content initiatives, such as solar programmes; and school-based programmes to foster skills, such as using issue investigation and action processes to apply sustainability (Rickinson, 2001). These research findings clearly support school-based initiatives such as AuSSI and the use of the SCF as a teaching framework.

More recent research into EfS action-taking has concurred with Rickinson’s (2001) findings on effective EfS. Chawla and Flanders-Cushing (2007) conducted research into how to promote children’s active care for the environment, including the examination of children’s engagement with political issues, given the wider potential impact of indirect action for sustainability over individual direct actions. The authors found that education programmes should continue for an extended period, provide opportunities to learn and practice environmental action skills, and deliver success in achieving some valued goals to generate motivation and empowerment, both individually and as a group. Whole school sustainability programmes, such as AuSSI, incorporate these characteristics, supporting long term engagement with real direct and indirect sustainability actions.

Whole school sustainability (WSS) programmes are action orientated, with sustainable behaviours adopted to improve school sustainability, occasionally in order to receive accreditation as a sustainable school or eco-school (Henderson & Tilbury, 2004). The process of WSS is participatory and democratic, including students, parents and community members with school staff to audit school sustainability and develop and deliver action plans to improve sustainability. WSS includes both direct actions, such as revegetating school grounds with native plants to improve native habitats, and non-direct actions, such as writing letters to petition local government to provide infrastructure for active school travel (Australian Government, 2011). Children can engage with the political, economic and socio-cultural aspects of sustainability actions within schools, and there is considerable potential for wider community impacts through local partnerships. There is evidence that mastery and success with sustainability behaviours in school grounds may subsequently filter out from students and teachers to the family and community (Ballantyne & Packer, 2008; Ozer, 2007). However, despite being the focus of
government policy since 2005, there are considerable barriers to the successful implementation of WSS to support EfS in schools. These barriers include leadership support, access to resources, and teachers’ knowledge and experience of sustainability education (Evans, et al., 2012; Henderson & Tilbury, 2004; Scott, 2009). Even when sustainability actions are conducted in schools, a constructivist approach to EfS requires more than simply action taking (Nagel & Lidstone, 2008).

Henderson and Tilbury (2004) concluded in their ARIES review of WSS that actions need to be meaningfully integrated with class curriculums in order to support future sustainable behaviours in learners. It appears from the literature evaluating sustainable schools that the educational and curriculum aspects of sustainability are not always as evident as the WSS actions that reduce resource use and manage waste (Scott, 2009). Nagel and Lidstone (2008), in a rare study of children’s experience with EfS, found that students in both Australia and Canada reported confusion from performing school sustainability actions in isolation from the classroom curriculum. Sustainable schools may be missing the opportunity to deliver learning for sustainability while performing real sustainability actions.

Eilam and Trop (2010) developed a pedagogical framework for EfS in order to define for teachers the teaching strategies that support environmental action taking. The authors concluded that four pedagogical strategies were required in order for responsible environmental behaviour to be likely to occur: traditional learning to ensure learners understand key concepts and constructs; interdisciplinary learning that links issues across subject areas; multi-dimensional learning across time or space, by applying findings to another site or comparing one site over time; and emotional learning through consideration of a range of social perspectives (Eilam & Trop, 2010). The authors then analysed six EfS programmes for the four pedagogical elements. The successful programmes, that produced sustainable behaviour in learners, always included the four pedagogical elements despite wide variation in the actual learning activities and programme topics. Programmes that failed to include one element, such as emotional learning, did not succeed in fostering behaviour change.

Constructivist approaches to teaching sustainability have been found to be effective at achieving the action taking aims of EfS. Whole School Sustainability supports this, and engages learners’ with long-term actions in the outdoor
environment and potentially supports the delivery of interdisciplinary sustainability education. Eilam and Trop’s (2010) EfS framework requires further assessment and application, however the pedagogical elements align closely with the principles of EfS and the Sustainability Curriculum Framework. Significant life experiences in nature are often associated with adult environmental empathy and sustainability actions, and this literature will be examined in Section 2.1.3.

2.1.3 SIGNIFICANT LIFE EXPERIENCES IN NATURE

Adults who display conservation behaviours and attitudes overwhelmingly report that childhood experiences are the primary cause of their affinity with or empathy for nature, and an overview of this research is in Last Child in the Woods (Louv, 2005). In a large U.K. survey of 332 outdoor educators, Waite (2010) found an overwhelming majority of participants reported positive childhood memories of nature, with forty neutral experiences and only six negative experiences with nature. Positive childhood memories included: “social aspects, specific outdoor contexts, adventure risk and challenge and active investigation … creativity, sensory experiences, and space and freedom” (Waite, 2010, p. 213).

Jorgenson (2013) investigated teachers reasons for using school gardens and concluded that recall-based research involves nostalgia, with childhood memories becoming idealised. Blatt and Patrick (2014) investigated the outdoor experiences of 148 American pre-service teachers, and found overwhelmingly that teachers’ had significant childhood experiences in nature and over 66% intended to include outdoor learning activities in their future teaching. These findings concur with previous studies regarding teachers’ positive beliefs about learning in nature (Kennelly, et al., 2012b). The “significant life experiences” literature relies on the recall of adults regarding their own childhood, and this has led to methodological concerns due to its’ inherent subjectivity. However, in the absence of longitudinal studies, evaluating adult environmental action by examining adults’ meanings and beliefs about what prompted their environmental empathy has merit. The rarity of evidence to the contrary further supports this notion.

Lohr and Pearson-Mims (2005) conducted a nation-wide survey of American adults’ environmental attitudes and activities, and their associated childhood memories of nature. They found that those who grew up near natural elements such as gardens and parks, or who experienced environmental classes and childhood
gardening, demonstrated stronger adult environmental attitudes and actions. Although passive nature experiences were positive, the strongest influence on adult behavior was from active participation in childhood gardening. The authors propose that given increasing urbanization, childhood gardening in schools has a potentially critical role to play in fostering lifelong environmental attitudes and activities. There has been little research of younger participants who demonstrate environmental behaviours, and this is common across the EfS field (Nagel, 2004). Stevenson and others (2014) surveyed a random group of American middle-school students’ and found limited positive evidence that the presence of role models and time outdoors fostered pro-environmental behavior. Environmental knowledge was statistically associated with lower student/teacher ratios and county income, however the research findings fail to indicate how these factors may influence the delivery of EfS. Stevenson’s (2014) findings strongly reinforced the need for real experiences in nature, with a negative association found between watching nature television and environmental knowledge. This is extremely significant for current teaching practice, as the increasing ease of technology use in the classroom means that videos and online simulations are increasingly substituted for real life outdoor learning activities. The benefit of real experience-based learning over simulated inquiry was also reported by Lieberman and Hoody (1998), and will be discussed further in Section 2.3.3.

There is wide evidence of the importance of outdoor nature experiences in supporting the goals of EfS (Rickinson, 2001; Skamp, 2009a). Different nature experiences are associated with different outcomes for EfS, reinforcing the need for school grounds to offer natural environments for children to enjoy and explore in leisure time, as well as formal teaching in the natural environment (Malone & Tranter, 2003a, 2003b). Gill (2011) reviewed 61 international studies of significant life experiences in nature and found that formal outdoor learning experiences, such as gardening, were associated with improved academic and ecological knowledge. Informal, exploratory nature experiences offered health and affective benefits, including the development of positive environmental attitudes.

Unfortunately, there is growing concern about the recent decline in children’s nature experiences (Waite, 2010), and the gap between human beings and the natural world has been termed “nature-deficit disorder” by Louv (2009, p. 26). Schools are
being called upon to provide children with formal and informal engagement with the natural environment (Dyment, 2005a; Louv, 2009; Malone & Tranter, 2003b). Schools offer the opportunity for frequent nature experiences, and several educational programmes have been developed to support the greening of school grounds (Education Development Center and the Boston Schoolyard Funders Collaborative, 2000; Murphy, 2003). Considerable barriers remain to schools facilitating regular engagement with nature, including safety, school educational priorities and teachers’ time demands (Blatt & Patrick, 2014; Carrier, Thomson, Tugurian, & Stevenson, 2014; Dyment, 2005b). Section 2.2 will now examine outdoor learning in school grounds, and Section 2.3 will review the limited research on the process of teaching outdoors.

### 2.2 OUTDOOR LEARNING IN SCHOOLS

Skamp (2009a) asserted in his critical review of EfS that in addition to experience-based learning strategies, outdoor learning is essential: “there is strong evidence that students should learn in outside environments on a regular basis” (p. 10). Priest (1986) defined outdoor learning as a strategy that takes place primarily outdoors and is experiential; requires all of the senses; involves interdisciplinary content; and concerns the relationship between natural resources and people. This definition of outdoor learning aligns with the constructivist EfS teaching principles and strategies outlined in Section 2.1, and support the implementation of WSS. Unfortunately, the EfS theory-practice gap means that outdoor teaching remains an underutilised strategy, decades after this was established and accepted in the academic field.

Rickinson’s (2001) critical review of environmental learning reinforced the outdoor environment as essential to successfully delivering EfS. Programmes that achieved their objectives included:

- Role modelling and direct experience on outdoor courses; (and collaborative group work discussion in classroom lessons); opinions of others, indicating key relationships within the environment; and students enjoying the recreational aspects of being in the environment (2001, p. 275).

In 2004, Rickinson and others conducted a more specific review of outdoor learning research, and categorised outdoor learning in schools into three spheres: outdoor adventure education; fieldwork and outdoor visits; and school ground projects. Given
that off-campus activities occur rarely in the school year, a brief review of the EfS literature on outdoor adventure education and fieldwork is attached (see Appendix A). The literature on outdoor learning in school grounds will be reviewed in the context of school gardening (Section 2.2.1), and learnscapes (Section 2.2.2). Section 2.3 will examine the recent fieldwork teaching literature (Section 2.3.1), the limited research on the process of outdoor teaching and learning in school grounds (Section 2.3.2) and the use of the Environment as an Integrating Context (Section 2.3.3). The implications from the literature for this research will be examined in Section 2.4.

2.2.1 SCHOOL GARDENING

The majority of the peer-reviewed research on school gardens has been conducted from a nutritional or horticultural perspective (L. Gibbs et al., 2013; Morgan et al., 2010; Somerset & Markwell, 2008; Viola, 2006). The factors commonly found to facilitate the success of a school garden include the school principal’s support, specific curriculum materials and the availability of experienced adult volunteers or paid coordinators (Blair, 2009; Graham, Lane Beall, Lussier, McLaughlin, & Zidenberg-Cherr, 2005; Ozer, 2007). Enthusiastic teacher-gardeners often establish school gardens, but without wider school support other teaching demands take over and gardens may become neglected (Somerset & Bossard, 2009). Many of the school gardening studies have been conducted to evaluate the success of particular programmes and have potential for positive bias from researcher involvement in the programmes.

Aguilar, Waliczek and Zajicek (2008) examined the effect of the Junior Master Gardener programme on students’ environmental attitudes, however for the experimental groups the frequency and type of outdoor teaching was not controlled or described. The findings indicated that children with hands-on gardening experiences had more positive environmental attitudes, however due to the lax experimental design the authors could not conclude whether that was due to prior hands-on gardening experience or the outdoor learning activities engaged in at school. Most schools have gardening lessons only once per week, thus the impact of gardening alone on students’ environmental learning is potentially over-stated.

There is a significant body of qualitative evidence concerning the positive academic, cognitive, affective, social and physical benefits for learners from weekly gardening sessions (Blair, 2009; Dyment & Bell, 2007; Graham, et al., 2005; Malone
The qualitative gardening studies often have methodological concerns; either from small participant samples or from positive bias due to the researcher delivering the gardening programme that was being evaluated. The quantitative evidence is less positive, often demonstrating no significant difference in maths and science test results between children who garden and those who do not (Pigg, Waliczek, & Zajicek, 2006). This is unsurprising, given the potential for enthusiastic participants to report a myriad of benefits from gardening, while explicit teaching in the garden, for example applying abstract mathematical concepts, may or may not be occurring. There has been little Australian research on the academic benefits of school gardening, although there is considerable mention of the prevalence and benefits of school gardening in professional education journals (Widdop Quinton & Cutter-Mackenzie, 2008). In order to address the need for more rigorous research and verify the claims of benefits from school gardens, Block and others (2012) conducted a study of six school gardens, using both quantitative and qualitative methods.

In agreement with the international school garden literature, Block and others (2012) found that although the qualitative data from the kitchen garden programme schools reported many positive social and student behaviours, the quantitative results, such as school attendance records, showed no significant difference with either longitudinally or between programme and control schools. This may demonstrate the difference between weekly kitchen garden programmes and the classrooms using the environment as an integrating context (EIC) in America, where significant improvement in both attendance and academic data was demonstrated (Lieberman & Hoody, 1998). Weekly kitchen garden classes do not necessarily result in classroom educators incorporating outdoor learning into their regular teaching practice. However, all kitchen garden stakeholders, including staff, children and volunteers, reported common positive outcomes beyond the original health objectives: “Opportunities for experiential and integrated learning, teamwork, building social skills, social connections, and links between schools and their communities were seen as critically important” (Block, et al., 2012, p. 430). Non-academic, or diverse learners gained the most benefit from engagement with the programme, which may explain the lack of consistent significant differences in academic measures overall, given that the majority of students make more moderate academic gains. These findings support the use of outdoor learning as a strategy to engage and support
diverse learners. They also reinforce the need for the inclusion of qualitative research methods when evaluating EfS programme success, in agreement with Lieberman and Hoody (1998) and the more recent EfS research tends to use qualitative or mixed-method methodologies.

School gardens have been used to promote EfS for decades. In a survey of Florida teachers who used school gardens, 97% of teachers reported teaching in gardens for environmental learning (Skelly & Zajicek, 1998). Waliczek, Lineberger, Zajicek and Bradley (2000) conducted a web-based survey of adults involved with children’s gardening, and every respondent believed that gardening taught children about nature and the environment, while almost half believed it reduced stress and enhancing self-esteem in children. More recently in Australia, Somerset and Bossard (2009) found a diverse range of gardens were developed in response to a variety of aims, including health, environmental, finance and behaviour management reasons.

There is considerable potential for delivering WSS and integrating cross-curricular sustainability in gardens. In a review of the effect of school gardens on students, Ozer concluded EfS was often an important objective: “the over-arching goals of many school gardens extend beyond individual health and behavior to environmental sustainability” (2007, p. 848). Gardening may influence future environmental dispositions through children’s increased opportunities for engagement with nature (Aguilar, et al., 2008; Gill, 2011). Blair (2009), reviewed the benefits of school gardening, and concluded that ecological knowledge and social behaviour were widely reported in the qualitative gardening studies but not consistently demonstrated in quantitative studies. Despite the methodological concerns, there appears to be widespread support for positive EfS outcomes from gardening from across the literature.

The garden research reports teachers using school gardens for curriculum delivery in a wide range of subjects. Subjects taught in the school garden include literacy, mathematics, science, environmental education, health, art, Languages Other Than English (LOTE), drama and social studies (Blair, 2009; Graham, et al., 2005; Winters, Ring, & Burriss, 2010). In Australia, Somerset and Bossard (2009) examined the use of school gardens in Queensland and found that almost 30% of surveyed schools had gardens that were used to teach social and environmental skills, nutrition and plant-study in science. The variety of subjects taught outdoors supports the considerable potential for school gardening to enhance interdisciplinary learning

It is often reported that school gardens offer potential for curriculum integration and sustainability education, however few studies explain how this process occurs. Block et al. (2012) found “kitchen and garden classes functioned as a natural site for curriculum integration” (p. 424) allaying the fears of educators who were initially reluctant to add to their workload through joining the programme because core numeracy and literacy skills would suffer. Unfortunately, their research findings failed to detail for educators how this curriculum integration occurred in practice. Viola (2006), a community nutrition officer, examined two case studies of school gardens in different remote indigenous communities from a nutrition and health perspective. The educational benefits from gardening, primarily through increased student motivation, led to the garden being integrated across the curriculum with mathematics, science and technology, literacy, art, health and PE and life skills. One teacher reported “every lesson was tied into the school garden and nutrition, we found the process was part of our usual school day” (Viola, 2006, p. 236). Viola is one of few researchers to also include the learning activities used in the garden in their research findings, and these clearly illustrate how the garden provided an integrating context for curriculums and supported EfS delivery. Literacy activity examples include reading recipes, reading nutrition-themed books such as James and the Giant Peach and writing a weekly diary of what was happening in the garden. The use of the Environment as an Integrating Context (EIC) to integrate outdoor learning with interdisciplinary curriculum delivery has academic and social benefits for learners (Lieberman & Hoody, 1998) and clearly supports the implementation of cross-curricular EfS.

Qualitative school gardening studies show positive findings regarding the wider definition of sustainability, such as participation and building community (Mansuroglu & Sabanci, 2010; Skelly & Bradley, 2007). Somerset and Bossard (2009) reported the factors that influence school garden development include: school size and whether the garden was a class-based activity or whole-school activity; whether gardens were established in schools specifically because of a particular educational project; and the level of local community involvement (school-based community gardens established in conjunction with the broader non-school community with long-term community intentions, beyond curriculum demands).
School gardens across the world promote community building through broader adult interactions and community links, teamwork and student bonding, supporting the participatory learning goals of EfS (Ozer, 2007). In Ozer’s (2007) analysis of the benefits of school gardening, building community was an important feature:

School garden programs and curricula build on models of hands-on, problem-based environmental and science education. They also are a form of community garden, providing a new setting for interactions among members of the school community and potentially promoting the social networks, sense of connectedness, and skills of the community (pp. 847-848).

School garden programmes also support EfS through establishing connections to the local community and allowing learning in new ways, in addition to the inclusion of sustainability skills and actions within gardening contexts. Although the fundraising and maintenance for programme resources is an ongoing challenge, this may potentially lead to increased community connections with family and local businesses. Block et al. (2012) found the learning community was broadened through parental and community volunteer involvement in the programme, and teachers learned new skills while children learned from each other and a variety of mentors. These ways of learning align with several of the principles of EfS. Student engagement was also higher when trained experts led the kitchen garden programme, rather than schoolteachers. This further supports the earlier findings that experts were important for sustaining school gardening projects long-term (Graham, et al., 2005).

Ozer (2007) formulated a conceptual framework that outlines the potential effects of school gardening on students, families and communities (see Figure 2). The effects on students’ mental health and wellbeing are significant, given the flow-on effect on ownership, participation and motivation. Blair (2009) found that student gardening supported emotional and social wellbeing, and students were:

… delighted and highly motivated by the pleasures of gardening and the opportunity to get dirty outside and were excited by exploratory learning framed in a garden context … showed improved student attitude and pride in the garden and its produce … involved their parents, who became more involved in the school (Blair, 2009, p. 21).

Block et al. (2012) emphasised the particular importance of the affective and community benefits of gardening for at-risk students, to foster belongingness and empowerment.
Figure 2. Conceptual model of potential effects of school garden programs. (Ozer, 2007, p.852).
There are considerable benefits for learners and the school community from school gardening, but there are also common barriers to the long-term success of gardens. Ozer (2007) summarised the barriers to successful school garden programmes as:

(a) time on the part of teachers or maintenance staff “overloaded” with other duties, (b) funding, (c) support on the part of parents or volunteers, (d) gardening experience, and (e) space (e.g., space previously available for the garden lost because of an increase in portable classrooms). Other factors contributing to program closure were ineffective integration into the curriculum, vandalism, challenges in maintaining the garden during school vacations, illness or death of the teacher leading the program, and the garden program not being valued as a teaching tool in a time of increased accountability for student achievement (p. 849).

These factors are echoed in the Queensland research findings of Somerset and Bossard (2009). Enablers for sustainable garden programmes include: the Principal’s support; a paid coordinator; gardening or environmental experience, and curriculum integration. Interestingly, these enablers mirror the barriers to EfS delivery in schools. Evans, Whitehouse and Gooch (2012) found four factors that affected the successful inclusion of sustainability in Far North Queensland schools: time; money; staff resistance; and limits to educators’ conceptual understanding. This agreed with Summers and Kruger’s (2003) findings that educators’ conceptual understanding of sustainability was a considerable barrier to implementing EfS practices in schools, and professional development is therefore essential to school gardening, EfS and outdoor teaching. The barriers to adopting EfS practices in schools may be overcome by proactive principals using enabling leadership skill to develop trust between staff. By fostering open discussion and allowing negotiation and development of educators’ understandings of sustainability, Principals can support EfS implementation (Evans, et al., 2012).

Although there may be issues with the validity and reliability of the school gardening literature due to methodological concerns, the reported positive benefits from learners and teachers engaged in school gardening are widespread and support the need for more rigorous investigation into the educational process. The absence in the literature of any dissent against or potential harm from school gardening provides
further support for the practice. In 1995, Moore concluded that school gardens were the key to teaching sustainability: “the fact that it is easy to define and justify educationally, gives gardening extra potential as an interdisciplinary pedagogical strategy for leading children along a sustainable development path” (p. 231). This statement may remain true today.

School gardening provides opportunities for children to engage with nature, improving mental, physical and social wellbeing, broadening learning opportunities, and potentially developing positive environmental attitudes, skills and knowledge. School gardens may support the principles and delivery of EfS through incorporating sustainable behaviours and actions, such as permaculture principles, within gardening practices. School gardens support the integration of interdisciplinary learning and curriculum delivery. When environmental learning outcomes are the primary objective of school gardens, they may support the implementation of authentic WSS and may be termed learnscapes (Skamp, 2001). Thus school gardens are a valid topic of inquiry regarding EfS delivery.

2.2.2 SCHOOLGROUND PROJECTS OR LEARNSCAPES

School ground projects differ from school gardening in that they are specifically designed to alter or structure school grounds for environmental education purposes. These projects may be termed learnscapes: “places where a learning program has been designed to permit users to interact with the environment … planned and designed to support syllabus outcomes and to develop environmental education objectives” (Skamp, 2001, p. 8). The difference between a landscape feature and a learnscape is the learners’ engagement and collaboration in the ongoing process of design, maintenance and learning of a learnscape (Skamp & Bergmann, 2001, p. 334).

Learnscape projects are highly effective for EfS because they include three essential dimensions:

- Authenticity: students undertake ‘real life’ projects
- Skills and mastery: genuine environmental actions are undertaken
- Student participation: generating ideas, decision-making about how to proceed and the implementation of environmental actions (Rickinson, et al., 2004).
Learnscapes support students to apply knowledge from the classroom and engage with their local environment in sustainable ways, to “bridge the gap between environmental knowledge and action” (Israel & Meyer, 2002, p.16). This learning as sustainability allows learners to implement the sustainability action process, building capacity for future application of their analysis and decision-making skills to any environmental sustainability issue they may encounter (Scott & Vale, 2008). Learnscapes located within or near school grounds allow for more frequent nature engagement and long-term involvement in real sustainability projects.

School gardens that incorporate student-led environmental action may be termed learnscapes, as can nearby watercourses, forest or farm areas where environmental learning takes place. School sustainability projects, such as composting and worm farming and recycling systems, may be termed learnscapes if students are active participants in the ongoing process, design and maintenance of the project. In New South Wales, the implementation of AuSSI included professional and financial support for the implementation of school ground learnscapes (Skamp & Bergmann, 2001). Teachers reported students who learned outdoors in learnscapes were:

- enjoying their learning more being more ‘open’ [motivated] to learn;
- understanding content and skills better; remembering better;
- owning their learning more [e.g. when they were making rice paddies];
- following up their outdoor work with learning in other area, library searches;
- appreciating their environment better as well as value it more (Skamp, 2001, p. 10).

These findings align with the learner benefits from school community projects, which included: “improved health, science process skills, design and technology understandings, as well as greater confidence, renewed pride in community, stronger motivation toward learning, and greater sense of belonging and responsibility” (Rickinson, et al., 2004, p. 6). Despite these positive findings and teachers’ positive beliefs about teaching and learning outdoors, considerable barriers are reported to teaching outdoors regularly.

The barriers reported to regularly using learnscapes are similar to the barriers to school gardening and other types of outdoor learning. Dyment (2005b) examined outdoor teaching in school grounds in Canada, and found that although teachers regularly taught science and physical education outdoors, they rarely taught language
arts, mathematics and geography outside the classroom. Teachers cited reasons such as a lack of time, outdoor class management concerns, and lack of experience teaching outdoors, and Dyment concluded that teachers “found it difficult … to justify teaching outdoors” (2005b). Common barriers to outdoor learning include a lack of wider school support, insufficient teacher expertise and confidence, resource limitations and discipline or behavioural concerns. Barriers to the use of learnscapes are also focused on issues regarding the delivery and location of EfS in schools. Those educators who failed to use learnscapes regularly, cited similar issues:

- some subjects or topics (including science, computer studies, history and maths) not being suitable for learnscapes; management of students being too difficult; teacher uncertainty about how to incorporate or use learnscapes;
- difficulty with changing practice and planning outdoor classes; too little time;
- a lack of a priority for EE [Environmental Education], and little appreciation of outdoor teaching and the relationship between EE outcomes and learnscapes (Skamp & Bergmann, 2001, pp. 17-18).

In a later study of learnscape use in the same schools, Skamp (2009b) analysed teacher practice in terms of the adoption of learnscapes as a new teaching strategy. Teachers’ use of learnscapes was categorised from “Drop-outs”, who did not continue the strategy after the first attempt, to “Innovators”, who understood learnscapes and varied the approach to combine it with their other teaching (see Table 1). This framework will be used to categorise the use of outdoor teaching by educators in this research. Only two of the eight teachers in Skamp’s (Skamp, 2009b) study were considered Innovators, with the majority of teachers struggling to regularly teach outdoors even with policy, professional and financial support to incorporate learnscapes into their teaching practice. Thus the barriers to regularly teaching outdoors in primary schools appear to be considerable.

The benefits of school ground learning for students, the school and local community appear overwhelmingly positive and support the action-taking objectives of EfS. The successful integration of school ground community projects with the curriculum is heavily reliant on teachers’ expertise and support from the principal.
Table 1 Typology of Utilisation adapted from Skamp (2009b)

<table>
<thead>
<tr>
<th>Typology of Utilisation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drop-out</td>
<td>Teacher who does not continue to use the strategies after the first attempt</td>
</tr>
<tr>
<td>Struggler</td>
<td>Teacher continues to use the innovation but at a very mechanical level, making few changes and with a low level of understanding</td>
</tr>
<tr>
<td>Domesticator</td>
<td>Teacher who has taught successful lessons using the materials but has adapted the strategies to their normal teaching approach</td>
</tr>
<tr>
<td>Succeeder</td>
<td>Teacher has successfully used the approach with understanding but not enough to be independent of the curriculum materials</td>
</tr>
<tr>
<td>Innovator</td>
<td>Teacher who understands the approach and is able to vary and generalise it to their other teaching</td>
</tr>
</tbody>
</table>

In a multiple case study of outdoor learning in United Kingdom schools, Waite found a school-wide focus on the environment supported outdoor learning practices:

This appears to be a function of dynamics between values and perceived requirements and further emphasizes the need for the support of the head teacher if an investment in outdoor learning is to be made (Waite, 2010, p. 116).

Sustainability philosophies and practices need to be resourced, promoted and prioritised across the whole school community to support teachers with regularly taking learning outdoors. Having a supportive principal and a whole-school focus on sustainability are necessary but not adequate alone to support teachers’ use of outdoor teaching. Local community volunteers and mentors support the maintenance and use of school learnscapes, as do partnerships with local businesses for resources and materials. Community engagement also incorporates the broader principles of EfS.

Learning outdoors in school grounds has considerable potential to support the objectives of EfS and aligns with the constructivist principles of effective teaching.
for sustainability. Rickinson (2004) found that community projects support the implementation of cross-curriculum sustainability and WSS more closely than outdoor adventure education and fieldtrips beyond the local school environment. Learnscapes can support the implementation of interdisciplinary EfS and the integration of WSS with curriculums (Dyment & Bell, 2007; Lieberman & Hoody, 1998; Louv, 2005; Skamp, 2009b). Section 2.3 will examine the limited literature on the pedagogical practices used when teaching outdoors.

2.3 HOW DO EDUCATORS TEACH OUTSIDE CLASSROOMS?

Teaching outdoors is currently promoted as ‘good pedagogy’ across the world (Beames & Ross, 2010; Blair, 2009; Bowker & Tearle, 2007; Ozer, 2007). Despite this widely reported belief, there has been little examination of the process of teaching outdoors in schools (Bentsen & Sondergaard Jensen, 2012; Skamp, 2009a). Outdoor experience-based learning appears crucial to support both affective learning and EfS capabilities within WSS approaches: “to overcome the gap between pupils' knowledge and their actions in terms of environmental education we suggest that teachers should integrate outdoor learning into their teaching practice” (Golob, 2011, p. 221). As mentioned in Sections 2.1 and 2.2, whilst there are widely held beliefs and qualitative evidence that learning outdoors has considerable benefits for learners, there is little detail in the literature regarding what actually occurs educationally when classes are taken outside. School gardens and learnscape projects appear to support environmental and sustainability learning outcomes that impact the family and local community (Ozer, 2007), yet there has been little examination of the process of teaching and learning outdoors in schools (Skamp, 2009a).

2.3.1 FIELDWORK TEACHING

Outdoor adventure education and off-campus field trips are beyond the scope of this review, however a brief review of the literature is attached (see Appendix A). The use of school grounds may facilitate more frequent outdoor teaching and learning experiences by addressing the barriers to field trips and off-campus visits. There is a small body of recent research into the teaching strategies and pedagogies employed in fieldwork (Ballantyne, Anderson, & Packer, 2010; Ballantyne & Packer, 2009; Morag & Tal, 2012; Tal, Lavie Alon, & Morag, 2014; Tooth & Renshaw, 2009), which will now be examined.
Morag and Tal (2012) reviewed 22 Israeli field trip studies and found that the teaching methods used outdoors were usually didactic, “walk and talk” with a guide or teacher providing some demonstrations. After expanding their research to 62 studies, five high quality studies were selected for deeper analysis of best practice:

… students were active and highly engaged learners. They substantially interacted with the environment, the teachers were taking leading roles having clear goals, pedagogical means and they acted as mediators. The guides, too, used a variety of pedagogies. Finally, in all these field trips, students also reported on their meaningful experiences and provided much evidence for learning and for affective and social outcomes (Tal, et al., 2014, p. 431).

The exemplary field trips included good preparation in school prior to the excursion, collaboration between teachers and guides, active learning through activity and action, proper and frequent use of environmental objects, social activity for students, and making connection to the school curriculum and students’ own life experiences. These observations concur with the earlier findings on the characteristics of effective EfS programmes (Rickinson, 2001; Skamp, 2009a) and recent Queensland fieldwork research (Ballantyne, et al., 2010; Ballantyne & Packer, 2009; Tooth & Renshaw, 2009).

Ballantyne and Packer (2008) researched the pedagogies used in Australian fieldwork settings by evaluating the learning activities found to be effective in Outdoor & Environmental Education Centres (O&EECs). The researchers analysed the teaching strategies and modes of delivery used in twelve programmes, and surveyed both students and teachers regarding the environmental learning outcomes acquired during their visits. This methodology provided a deep understanding of the specific activities and strategies that resulted in EfS learning in a range of outdoor learning environments and habitats. The survey was repeated three months afterwards, allowing analysis of the teaching strategies that resulted in longer-term environmental outcomes. Despite the wide variation in teaching environments across the state, similar activities were reported to be effective by both teachers and students. Ballantyne and Packer (2009) categorised these strategies as a new pedagogical dimension, Experience-based Learning:

1. Learning by Doing - students are actively involved in exploration and investigation;

2. Being in the Environment - students experience and appreciate the
environment;
3. Real life Learning - activities are based on real places, issues and authentic tasks;
4. Sensory Engagement - students explore the environment using all five senses;
5. Local Context - students investigate issues and problems in “their own backyard (p. 260).

This pedagogy aligns closely with the constructivist principles of teaching EfS discussed in Section 2.1.1, and could potentially be used to support educators to select learning activities to use within school grounds.

Integration of indoor and outdoor learning is considered vital to make sense of outdoor fieldwork experiences. Tooth and Renshaw (2009) found that sandwiching outdoor learning, by orientating students to fieldwork before going outdoors and completing reflective activities afterwards, was necessary to support the goals of EfS. By consolidating environmental knowledge, attitudes and skills before, during and after an outdoor experience, the environmental benefits of the engagement with nature was maximised (Tooth & Renshaw, 2009). Ballantyne, Anderson and Packer (2010) combined experience-based fieldwork with reflective and metacognitive activities upon returning to the classroom. Students’ creative reflections were videoed and peer-reviewed and the findings reinforced the need for indoor-outdoor integration: “the most effective environmental learning experiences are likely to be those that integrate learning in the natural environment with classroom learning strategies” (Ballantyne, et al., 2010, p. 47). Reflection upon nature experiences afterwards enhances both ecological systems understanding and fosters the affective or emotional learning that appears to be fundamental to environmental action taking (Eilam & Trop, 2010).

Eilam and Trop (2010) examined successful EfS programmes and concluded that traditional teacher-directed learning is one of the four essential pedagogical elements required to produce action-competence in learners. Integration of indoor learning with outdoor experiences supports deeper understanding of the topic or issue, and allows deeper investigation and consideration of the issues affecting real sustainability actions or behaviours. Reflective activities allow consideration of the perspectives of others and facilitate emotional learning, another of the essential pedagogies required to foster environmental action-taking behaviour (Eilam & Trop,
Futures thinking, or multidimensional learning over time, is what distinguishes EfS from environmental education (Eilam & Trop, 2010; Tilbury & Cooke, 2005). Futures thinking may be facilitated by creative activities after outdoor learning to investigate the potential consequences of political and economic actions that affect environmental sustainability (Tooth & Renshaw, 2009). Futures thinking is also required when designing and selecting actions for sustainability, and considering the consequences of such actions when using the Sustainability Action Process (Australian Government, 2010).

The fieldwork pedagogy research contributes significantly to the body of knowledge regarding successful outdoor teaching strategies and EfS pedagogies. Comparative studies between groups who remain in the classroom and groups taught using field trips, consistently report higher ecology knowledge test results for the groups who experienced fieldwork (Fägerstam, 2014). These findings may be applied to school ground teaching, given the dearth of published research on outdoor teaching within schools. They support the potential to offer fieldwork experiences within school grounds.

2.3.2 TEACHING OUTDOORS IN SCHOOL GROUNDS

The focus within both the EfS and school gardening literature has often been on learner outcomes or the product, rather than how effective EfS is practically delivered (Gough, 2012). Few studies have detailed the pedagogies and strategies that are used when evaluating the benefits of teaching outdoors in school grounds. In the review of the benefits of school gardening, Blair (2009) concluded that it was not simply due to experiential learning outdoors:

The difference between a structured discrete experiential learning experience and a long-term involvement in a gardening process resides in the multitude of unstructured learning opportunities that are not in the lesson plan, happen spontaneously and non-hierarchically, and involve students and their adult mentors in multidirectional learning (Blair, 2009, p. 20).

Somerville and Green (2011) describe place-based learning as using the pedagogy of responsible uncertainty, and it could potentially apply to school gardens too. This will be further discussed in Section 2.2.3.
As mentioned in Section 1.1.3, repeated exposure to natural outdoor environment supports environmental competence and green school grounds offer the potential for regular nature experiences. Various studies have used outdoor learning experiences as a “treatment” and compared EfS learning in groups that learn outdoors and indoors. One study investigated the effect of outdoor learning experiences on primary students’ ecological knowledge and empathy with nature (Cronin-Jones, 2000) and concluded students learnt more outdoors than indoors, although their environmental attitudes were not significantly different to the indoor class. These equivocal findings are typical, and the results remain difficult to understand when few details are given of how the outdoor learning was conducted.

Carrier Martin (2003) examined the use of outdoor learning in a case study, and also found that while the environmental knowledge and environmental comfort levels of the Year 5 outdoor learning group increased significantly, there was no difference in the environmental attitudes or behaviours between indoor and outdoor learners. Carrier Martin’s methodology was quite rigorous and involved controlling the amount of outdoor teaching and prescribing a range of outdoor activity materials for teachers to choose from. The Year 4 students showed no differences at all, perhaps due to student immaturity and a lack of understanding of sustainability issues. Carrier Martin suggested the potential factor of teacher effect, as the Year 5 teacher took on the role of joint learner, rather than that of expert, meaning that the class actively investigated their environment and the teaching strategies were participatory. This further reinforces the need for the research to describe the pedagogies and strategies used by educators when teaching outdoors, so that more reliable conclusions may be drawn. Quantitative research concerning short-term ecological knowledge gains from learning outdoors is of little consequence to EfS as it fails to evaluate the attitudes, skills or actions for sustainability.

Few longitudinal studies into learning outdoors have been conducted. Fagerstam and Blom (2013) evaluated student’s ecological learning of science and maths in a long-term study of the effect of indoor and outdoor learning on high school students. The biology class had “several lessons outdoors … and mathematics lessons outdoors once per week” (Fägerstam & Blom, 2013, p. 56). The outdoor learning activities were described generally, including typical outdoor science investigations of plants, animals and abiotic parameters such as soil pH and light.
The findings indicated that the outdoor group gave richer descriptions of their experiences, enjoyed learning outdoors and had better retention of knowledge five months later. Outdoor learners reported positive attitudes and emotions regarding learning outdoors, having experienced more authentic practical learning experiences and more opportunities for student social interaction and engagement, especially in maths (Fagerstam & Blom, 2013). A preference for the outdoor learning environment has been reported in both teachers and students of all ages (Norddahl & Einarsduttir, 2014), despite concerns that modern children may fear nature (Louv, 2009). There are difficulties comparing school ground teaching to the fieldwork pedagogy literature due to the lack of detail in the school ground studies.

### 2.3.3 Environment as an Integrating Context (EIC)

There is a large theoretical body of literature on place-based learning, where students engage in the local, cultural, environmental and broader context of a place (Somerville & Green, 2011). Unfortunately, as with other outdoor learning, there has been little examination of what pedagogies are used and how place-based learning is delivered. The use of the environment as an integrating context (EIC) may create a more meaningful, interdisciplinary framework for constructivist education. The Californian State Education and Environment Roundtable (SEER) conducted a study of over 60 schools to evaluate whether positive academic and social outcomes occurred in learners taught this way (Lieberman & Hoody, 1998). This study has been widely cited as evidence of the academic benefits of gardening and outdoor learning, however there are several important factors required for outdoor activities to be classified as EIC.

EIC programmes in the SEER study exhibited six pedagogies: “the local environment, as a context for learning; integrated, interdisciplinary instruction; problem-, issue- based instruction; collaborative instruction; learner-centred, constructivist methods; and independent and cooperative learning” (California Department of Education, 2000, p. 2). The EIC approach clearly employs the teaching principles and strategies promoted in the EfS literature, government policies and Australian curriculum (ACARA, 2013; Australian Government, 2009; Skamp, 2009a). Lieberman and Hoody (1998) reported substantial evidence of positive academic and social learner outcomes from EIC, consistently demonstrating improved test results, attention and motivation for learning, while reducing
classroom behaviour issues when EIC classes were compared to traditional classes. The researchers found no statistically significant differences in quantitative measures of academic achievement or attendance, however the consistently positive qualitative data, across school leaders, educators, parents and students in all EIC classes, again highlights the difficulty of quantifying data when evaluating the educational and social benefits of an activity. Teachers’ written narratives were used as evidence of the pedagogies employed within each class, and data analysis showed that similar pedagogies and planning strategies were used by the EIC class teachers in various schools and were not found in the control classes.

EIC units of work were collaboratively planned and interdisciplinary, and included experience-based learning strategies instead of non-authentic, simulated problem-based learning: “The integrated, project-based programs are centered on a theme or essential question, which provides the foundation for interdisciplinary exploration” (California Department of Education, 2000, p. 4). The students’ projects were sited within the local community, developing real work skills, performing community service or internships. EIC classes regularly used school or local environmental learning centres and visited local community sites (place-based learning), as compared to the control classes that rarely ventured out of the classroom or on field trips. Significantly, the control classes occasionally taught using interdisciplinary units, however these were not taught collaboratively and tended to involve simulated tasks rather than real local issues or topics.

The overwhelmingly positive findings and research rigour in the SEER study, have resulted in the study being often cited as evidence of the academic benefits of learning outdoors. The observed benefits from integrated outdoor learning included: “better academic achievement in reading, math, science and social studies; reduced discipline and classroom management problems; increased engagement and enthusiasm for learning; and greater pride and ownership in accomplishments” (California Department of Education, 2000, p. 5). Overall, EIC classes had more positive standardised test results (77%), better discipline (100%) and better attendance (77%) than the control classes (California Department of Education, 2000, p. 21). Blair’s (2009) school garden research concurred, with nine of twelve schools that used school gardens for EIC showing improved science achievement and social outcomes, occasionally without the wider use of school grounds or the local
environment. This further supports Moore’s (1995) contention that the most important feature of school grounds to support EfS delivery is a vegetable garden. Professional development for teachers to enhance their gardening knowledge and financial resources for school gardens could potentially promote the pedagogical use of EIC and support interdisciplinary EfS implementation. Explicit integration of school ground learning with class curriculums could maximise both environmental and academic learning outcomes, and potentially support future environmental behaviour taking through nature engagement and EIC.

Place-based, EIC learning aligns with the Danish concept of “udeskole” (outdoor school), where curriculum-based outdoor learning is regularly planned and organised, although it is usually beyond the school grounds. Students learn in a constructivist way in an authentic context: learning about nature and the local environment while in the local environment (Bentsen & Sondergaard Jensen, 2012). Despite outdoor learning being commonly reported in Scandinavian schools, Bentsen and Sodergaard Jensen found this was largely ad hoc, with only a quarter of udeskole teachers delivering outdoor classes more than once a fortnight (Bentsen & Sondergaard Jensen, 2012). Interdisciplinary activities were conducted outdoors by 44% of these teachers, indicating that use of EIC was not as universal as expected. A wide range of subjects were taught outdoors, in agreement with the school garden literature: almost all educators taught “pupils’ all-round development” and science; and maths, literacy and Physical Education were taught by over half of respondents (Bentsen & Sondergaard Jensen, 2012).

A recent case study investigated the interdisciplinary use of outdoor learning in schools. Eick (2012) conducted a single case study of a primary teacher’s use of integrated outdoor learning in school grounds to support science and literacy curriculum delivery. Literacy was a school priority and the teacher closely linked nature study with literacy tasks, selecting texts to illustrate the required literacy genres, such as poems about trees, instead of unrelated poetry. This approach, using concept-based reading on an ecological theme, has been found to produce higher reading comprehension, strategies and engagement scores in a wider study of 315 fourth-grade children (Wigfield et al., 2008). The students in Eick’s (2012) study showed increased motivation in reading and writing, especially the lower achievers, who the teacher believed built their self-esteem outdoors: “This is an area where they
Examples of outdoor learning activities that met curriculum objectives are provided in the findings, and include a water quality survey and leaf and plant identification tasks (Eick, 2012). Academic indicators were not found to be statistically significant compared to other classes or school averages, although all but one student achieved state achievement standards. The research is significant because of its’ deep description of the process of using the natural environment as an integrating context (EIC) for learning in school grounds, and further confirmation of the benefits of outdoor learning for at-risk learners.

2.4 IMPLICATIONS FROM THE LITERATURE

This research will reduce the theory–practice gap in teaching outdoors through conducting a single case study to deeply examine how outdoor teaching is used in a primary school. The literature findings on learning outdoors (Rickinson, et al., 2004), EfS pedagogies (Eilam & Trop, 2010) and teaching outdoors (Ballantyne & Packer, 2008; Lieberman & Hoody, 1998; Skamp, 2009b) provide a theoretical framework through which the process of teaching in school grounds will be examined. EfS is most effectively taught through constructivist pedagogies that include outdoor experience-based learning and interdisciplinary topics.

The EfS literature reports that both teachers and learners believe environmental learning requires outdoor learning activities (Ballantyne, et al., 2010; Bogner, 1998; Gambino, Davis, & Rowntree, 2009; Simmons, 1998). Outdoor learning activities may allow learners to understand the complex links between their education, home life, the natural environment and their future; both human and ecological systems. Outdoor teaching and learning in school grounds increases children’s opportunities for hands-on nature contact and supports the various aspects of effective EfS pedagogy: interdisciplinary learning; multidimensional learning; emotional learning; and when integrated with classroom curriculums, teacher-directed learning (Eilam & Trop, 2010). Using the local environment as an integrating context for learning about real issues and topics promotes academic and social outcomes more than simulated tasks (California Department of Education, 2000; K. T. Stevenson, et al., 2014).

Experience-based Learning (local context, real life learning, being in the environment, hands on, sensory engagement) supports the development of
environmental knowledge, attitudes and behaviours (Ballantyne & Packer, 2009). Childhood nature experiences are often cited as the reason for adult environmental empathy. The current generation of children may have fewer opportunities for direct contact with nature and often depend on secondary sources such as television to learn about ecology. The research indicates that teaching and learning in school grounds may overcome several of the reported barriers to outdoor learning experiences, yet educators continue to report difficulty with regularly taking their classes outside (Dyment, 2005b; Skamp, 2009b). Chapter 3 will describe and explain the research design adopted to investigate teaching outdoors in school grounds.
3. Research design

Chapter 3 describes the research design adopted by this study to achieve the research objectives. Section 3.1 discusses the methodology to be used in the study and how this methodology was implemented. Section 3.2 describes the research site and the participants in the study. Section 3.3 details the data collection instruments used in the study and justifies their selection. The conduct of the study is described in Section 3.4. Section 3.5 explains the process of data analysis and Section 3.6 discusses the research rigour and limitations of the research.

3.1 METHODOLOGY

This chapter will explain why a qualitative case study method was selected to answer the research question: “how is outdoor teaching used in a primary school?” Educational researchers adopt different approaches to research depending on their ontology, or definition of the nature of reality or knowledge, and the theoretical perspective through which the researcher views knowledge and meaning (Punch, 2009). The formulation of the research question determines the type of data required to answer it, and consequently the methodology chosen to investigate the research topic (Shulman, 1988).

The nature of the research question “how is outdoor teaching used in a primary school?” resulted from the researcher’s constructivist ontology: “realities are local, specific and constructed; they are socially and experientially based, and depend on the individuals or groups holding them” (Guba & Lincoln, 1994, pp. 109-110). A positivist approach to quantify the frequency and type of outdoor teaching activities used in schools would make little contribution to knowledge about the process of teaching outdoors. Constructivist ontology recognises the active participation of the educators in producing and verifying meaning about teaching outdoors. An interpretivist theoretical approach to research followed, as the researcher sought to understand how and why teachers planned and organised outdoor learning activities to support curriculum delivery.

Interpretivism is the research paradigm adopted in this study. It is the researcher’s way of knowing or “the relationship between the researcher and that
Interpretivist research aims to establish the subjective meaning of participants and uncover what participants believe to be true and their understandings of their world (O'Donoghue, 2007). Behaviour is viewed through the participants’ perspective and requires deep investigations into what their individual meanings are, why participants believe them to be true and act as they do. Interpretivists seek in-depth understandings of a situation, they are “concerned with the quality and texture of the experience … to describe and possibly explain events and experiences, but never to predict” (Willig, 2013, pp. 51-52). Interpretivist researchers allow for multiple interpretations of the situation, making interpretivism an ideal framework for this research question.

The interpretivist approach to EfS research focuses on education in, through and with the environment, with the emphasis on the holistic interactions of people and the environment (Lee & Williams, 2001). In this case study, the results and analysis will firstly describe the setting, the physical and social environment of Apple State School, and secondly the practice, beliefs and behaviour of educators in response to this particular context. The educator is viewed as the facilitator and organiser of outdoor learning experiences, with students as active learners and interpreters of knowledge and behaviour though their experiences. Only the educator’s perspective is sought because the research question is focused on their professional practice and the process of teaching outdoors, which has not been previously studied in detail. A variety of responses to the research question was expected from participants due to their subjective meanings and personal experiences of outdoor teaching.

In qualitative research, the researcher may be seen as an instrument or part of the study due to their influence over what data is collected or attended to during analysis. The participant’s responses to this research were interpreted by the researcher, who made sense of the data through following a process of manual qualitative data analysis to code the themes that emerged. For this reason, it is important to acknowledge the researcher’s reflexivity (subjective perspectives and understandings) that define any potential biases towards the research design and analysis.

The adoption of interpretivism by the researcher determined that qualitative research methods were used in this study. Although all primary school settings share certain conditions and ways of operating, there is a wide variation between the
settings and practice of schools depending on resources, management, personnel, the built and natural environment and other factors. Even within one school setting, it is expected that a variety of approaches to teaching practice occur, depending on individual or subjective differences in educators’ perceptions and experience. Explaining how and why the educators behave as they do is essential to understanding the process and practices they employ when they teach outdoors. Therefore, an in-depth analysis of educators at one school was chosen in order to describe the range of understandings, strategies and use of outdoor teaching activities.

Case studies are an appropriate tool for research in education because they focus on understanding relationships between contexts and practices. This research examined one case or set of circumstances bounded by time and place: educators’ use of outdoor teaching in school grounds at a primary school. The use of case studies in educational research has been well established and case studies are often used for professional development and action research in outdoor learning (Allison, et al., 2012). Despite limitations to generalisability, the case study is a preferred strategy when “how or why” questions are posed and the focus is on contemporary phenomena within a real-life context (Yin, 2003). The researcher sought to develop individual understandings of outdoor learning activities to provide detailed information regarding the process of teaching outdoors, rather than grouping results across the case by summarising individual responses (Creswell, 2009). The aim of the study was not to generalise the results to other contexts, but to deeply examine and explain outdoor teaching in this one case.

Single case studies in particular may not be generalisable due to the small number of participants, however this is no longer considered to be a weakness in the methodology: “A more reasonable expectation might be that readers learn vicariously from cases in such as way as to motivate them to engage in a project of their own” (Kyburz-Graber, 2004, p. 272). Individual case studies have been used to examine EfS activities when teachers have struggled to integrate environmental aspects into their teaching practices (Hart, 2007) or to examine a case of best-practice (Eick, 2012). Thus the case study was selected as an appropriate method for this qualitative research into teaching outdoors.

The case study methodology enabled detailed investigation by allowing multiple data collection strategies over time, generating more data than with a single
data collection tool. The researcher collected data using a survey questionnaire and an interview. The interview greatly enhanced the depth of the data collected and allowed the researcher to clarify and extend the initial written responses. The repeated contact with participants and the school environment increased the validity of the data, providing “prolonged engagement and the development of rapport and trust within a clearly defined and highly relevant context” (O’Leary, 2010, p. 174).

There is little published research on the process of teaching outdoors and there have been calls for such research to be conducted (Lee & Williams, 2001; Skamp, 2009a). Several aspects of this research study are adapted from Ballantyne and Packer’s (2008) study of excursion-based outdoor education programmes and Skamp’s (2009b) evaluation of teachers’ use of learnscapes, as a way to evaluate adoption of the educational strategy of teaching outdoors. In order to gain a deep understanding, the researcher decided to examine in detail one case of outdoor teaching in a school, and the research methodology employed in this research may be applied to multiple case studies in the future. The fundamental component of this case study was selecting a suitable research site and participants.

### 3.2 RESEARCH SETTING

The first step in a case study approach is to identify a site and the key informants (Cohen, Manion, & Morrison, 2000). It was decided to restrict the study to one case where outdoor teaching was known to occur regularly as an example of best-practice. The researcher had visited eight schools in the region in previous years, and selected Apple State School because outdoor teaching was scheduled weekly as part of the kitchen garden programme. Other schools in the region occasionally taught outdoors on an ad hoc basis. It is considered to be valid to select a best-practice site for the examination of teaching outdoors when it is commonly reported as a problematic teaching strategy.

#### 3.2.1 RESEARCH SITE

Apple State School is set in a semi-rural area, with neighbouring farms and a rainforest and creek beyond the school grounds. The school grounds have well-established trees and vegetation, with two open grassed areas between buildings that are regularly used for outdoor learning activities, in addition to a large oval and several treed playground areas. The school has an above-average Index of
Community Socio-Educational Advantage (ICSEA) score and attracts families from all parts of the local region. Apple State School has had a vegetable garden for over ten years, and for the last four years the upper primary students (Year 4, 5, 6 and 7) have been involved in weekly gardening and cooking classes. The school received a local community award for sustainability in 2009.

Due to the researcher’s knowledge of the school’s kitchen garden programme, it was known that learning outdoors regularly occurred at Apple. The researcher assumed that links were made between the curriculum and the kitchen garden activities conducted at the school, however this was not known at the commencement of the study. The kitchen garden is focused on nutrition and health, with children growing and cooking produce from the garden. At the commencement of the research, it was not known if EfS was a priority of the school or whether class teachers used outdoor teaching activities beyond the scheduled weekly kitchen garden classes.

3.2.2 PARTICIPANTS
The researcher invited all educators at the school to participate in the study, in order to get an overall picture of teaching outdoors at the school from a variety of educators’ perspectives. It was considered essential for the researcher to include a full representation of perspectives in order to establish what actually occurs at this school, how it is planned and the reasons why this occurs. Triangulation of the data through multiple participants allows different sources to verify what others report. This assisted the researcher to assess the validity of what is reported and “confirm the authenticity of each source” (O’Leary, 2010, p. 115). Triangulation does not preclude individual interpretations from being reported, and rare responses or noted silences were presented in the findings and made significant contributions to understandings of the case. The study was restricted to teaching staff and excluded community volunteers because the research questions focus on the pedagogies and teaching strategies used outdoors.

Exact participant numbers were dependent on the voluntary nature of the research. The researcher expected that through her presentation of the research at a staff meeting, participation numbers in the research would be maximised, as educators were given time to complete the survey during their meeting. It was considered important to include the views of those educators who rarely teach
outdoors, as well as those who more frequently employ outdoor teaching activities, to reduce positive bias. However, due to the voluntary nature of the research it remains possible that educators who rarely venture outdoors may not have participated in the study. 15 of the 24 educators at the school took part in at least one item of data collection, although no Preparatory or Year 1 educators participated. The researcher expected a range of educators’ perceptions and behaviours in this case, given the potential for subjective interpretations and experiences of outdoor teaching.

### 3.2.3 APPROVAL TO CONDUCT RESEARCH

The research commenced after the University of the Sunshine Coast (USC) Ethics Department granted approval (HREC:S/12/436) and the school principal approved the Education Queensland Research Request and signed the Consent to Research - Site. Details of the Research Project Information Statement (Appendix B) and Site Consent Form (Appendix C) are attached. The data collection instruments will be further explained in Section 3.3.

### 3.3 DATA COLLECTION INSTRUMENTS

This research employed a case study approach to answer the research question, as outlined in Section 3.1. Case studies require multiple methods of data collection (Creswell, 2009), and in this research a written survey and follow-up interview were conducted. The written mixed-method survey was given to all educators to complete voluntarily, and all participants were subsequently invited to participate in a semi-structured interview.

#### 3.3.1 MIXED SURVEY

Surveying is commonly used in case studies. This study sought to understand educators’ use of outdoor teaching in school grounds using a written survey instrument that included both closed and open-ended questions (Appendix D). The researcher adapted the survey instrument for teaching in school grounds from Ballantyne and Packer’s (2008) survey of outdoor learning. This simplified the data collection by applying the terms and definitions of strategies used on field excursions to a school context, allowing for comparison of the data and simplification in analysis. In the original study, research assistants analysed and categorised the teaching strategies used in the outdoor education programmes prior to the interview.
stage of the research. In this study, educators completed this programme analysis due to difficulties regarding parental consent for the researcher’s observation of students. Professional colleagues provided the researcher with feedback on the survey and small corrections were made prior to the start of data collection. The survey included questions regarding educators’ educational experience and time at this school, as this may have influenced the participant’s responses to teaching outdoors. Questions were designed to evaluate “levels of use” of outdoor teaching, to allow for comparison to the categories of teachers utilisation of learnscapes reported in Skamp’s (2009b) NSW study. The researcher included the teaching delivery modes and experience-based learning strategies reported by Ballantyne and Packer (2008) to assist educators to explain and define the learning activities and strategies they use outdoors. This was designed to stimulate educators’ reflections and reduced any confusion about answers, while simultaneously categorising outdoor learning activities in the same pedagogical terms. For example: “Question 6. Please circle the delivery modes you have used while teaching outdoors: Field Investigation; Presentation: Interpreted Walk; Discussion or Debate; Physical Activity; Other” (Appendix D). Ticking or circling responses maximised the reliability of data collection through reducing the chance of accidental omission. “Other” options were provided for responses that varied from those provided and allow for alternative responses. The survey instrument also included open-ended questions that allowed participants to fully explain their answers, increasing the depth of the inquiry.

3.3.2 SEMI-STRUCTURED INTERVIEWS
Interviewing is asking questions and listening to responses. In this study, interviews were conducted in an informal, semi-structured manner in order to generate unexpected data. Semi-structured interviews start with a defined questioning plan, but may change to follow the natural conversation and interesting tangents (O’Leary, 2010). Interviews were designed to extend and clarify participants’ survey responses, elaborate on examples of specific outdoor learning activities and the relationship between outdoor learning activities and classroom curriculums, while clarifying educators’ beliefs about teaching outdoors. The Interview Sample Sheet is attached (Appendix E). The interviews provided further validation of the initial data collection through discussion of the researcher’s interpretations and this approach
significantly improved the researcher’s understandings of the data. All survey participants were invited to participate in a 40-minute semi-structured interview and the Interview Consent Form (Appendix F) was first completed. Interviewing all participants generated more data and reduced the chance of participant identification, preserving anonymity in the findings of the case study.

3.4 CONDUCT OF THE STUDY

There was a single stage for data collection in this study, involving the administration of survey questionnaires and follow-up semi-structured interviews within one teaching year. Data collection was completed in Semester One, 2013.

3.4.1 DATA COLLECTION

The survey was administered ‘face-to-face’ during a staff meeting in order to maximise participation. The hard copy format supported self-correction or extension of responses as the participant moved through the questionnaire, which online surveys may limit. The written questionnaire also allowed participants to use mind-maps or other graphic representations to respond to questions, an option not available with online surveys.

Following initial data transcription, all research participants were invited to participate further in the research study during a staff meeting and were given the Interview Sample Sheet (Appendix E). Additional Research Project Information Sheets (Appendix B) and Surveys (Appendix D) were made available for any new participants to join the research at this stage, however there were no additional participants. Interviews were arranged at educators’ convenience and took place over four days in Term Four, 2012 and Term Two, 2013.

3.4.2 RESEARCH PROCESS

Fifteen educators participated in the study, including eleven classroom teachers, three teacher aides (trained kitchen or garden specialists) and the Principal. Thirteen participants completed the survey questionnaire and the transcribed data was collated. The nine interviewees member-checked their survey questionnaire (and interview sheet if applicable), increasing the validity of the case study (O’Leary, 2010). Some participants also completed the written Interview Sample Sheets, which were distributed for participants’ prior preparation.
Interviews were conducted outdoors in the school grounds whenever possible. Outdoor interviews increased the “ecological validity” of the data (Beames & Ross, 2010) and further stimulated educators’ responses by being in the exact environment under investigation. Interviews generally began with a question regarding an example of an outdoor teaching activity that was used to support curriculum delivery. In addition to gathering data on outdoor teaching examples, the researcher also sought to clarify understandings from educators about the teaching of sustainability at the school.

All interviews were conducted within the 30-minute period allocated by participants, with most interviews lasting approximately 20 minutes. The researcher interviewed the principal last, as suggested by Cohen, Manion, and Morrison (2000), in order to have a good understanding of the case beforehand and allow for further clarification of the school’s use of outdoor teaching. In order to preserve anonymity, the Principal’s data was not separately identified in the findings but rather included with the educators’ comments to triangulate and add depth to various aspects of the case.

3.5 DATA ANALYSIS

Data analysis in qualitative research is extensive. Due to the small number of participants and the methodology of the research, it was not appropriate to conduct quantitative data analysis, however tabulation of some responses facilitated discussion and comparison of the data. For example, the number of educators who used a teaching delivery mode outdoors gave an indication of its prevalence in this case. There were two stages to the data analysis: the ‘office work’ process of organising the qualitative data by sorting and indexing data into manageable parts, originally outlined by Miles and Huberman (1994); and the researcher’s analysis, interpretation and retelling of the data. This analysis process was conducted in a logical sequence, as suggested by Gibbs: “starting with the use of the ‘office’ procedures, then moving to the reduction of data into summaries or displays, before finishing with interpretive analysis and drawing conclusions” (2007, p. 2).

Thematic coding is the process of analysing data used in this study, and involves attending to “commonalities, relationships and differences across a data set” (Gibson & Brown, 2009, p. 127). The word ‘thematic’ relates to the aim of searching for themes within the data collected, and this approach aligns closely with the
interpretivist methodology. Thematic analysis focuses on the qualitative aspects of the material collected, as opposed to content analysis that results in numerical data regarding the frequency of responses.

Data transcription was the initial stage of data analysis. Closed survey data responses were compiled into an Excel document to allow for comparison of the use of outdoor teaching in the study (for example, see Appendix G). Open survey responses were tabled to facilitate comparison of responses and themes across participants (see Appendix H). The survey and written interview data were combined because the interview questions specifically followed up survey questions, and an example is attached (see Appendix I).

In the second stage of data analysis, codes and categories were used to group similar data responses, rather than to further abstract or theorise the findings. Data was initially categorised using an approach adapted from Gibbs (2007) to code responses into their type. For example, Gibbs (2007) defined the code strategy as a method that participants employ to achieve an objective. During data analysis, the strategy of using outdoor teaching for “experiencing something that is in the curriculum for science and SOSE” was further coded into the theme of “indoor-outdoor integration”. While acknowledging the researcher’s reflexivity and knowledge of the field, this theme emerged from the thematic coding of the data set, rather than being imposed as an a priori category to group the data.

This process aligned with the interpretivist methodology described in Section 3.1.2 and was in response to the data collected, which the researcher represented as a mind map (see Appendix J). Categories described by Gibbs were grouped into two areas by the researcher, firstly into the site for the research: state, setting, participants, constraints or conditions; and secondly, the practice and understandings of educators in response to that context: activities or events; strategies; adaptations; consequences; and meanings (2007, pp. 12-13). The process of analysis was interpretive; bringing findings together, examining them and combining the essential features into a transformed whole that described the case.

The aim of this study is to identify meanings that are valid across multiple participants and any inter-connections between them, rather than deeply analyse the interconnections between the meanings of each participant. This did not preclude unusual data from being reported and the research findings include participants’ responses in order to provide evidence for the researcher’s conclusions. Reduction of
the data into higher codes or categories would have little meaning and fail to answer the research question. The thematic analysis of the data enabled comparison of the emerging themes to those present in the literature. However, given that the specific context of this case study may be quite different to other schools, the researcher makes no claim as to the generalisability of the findings.

The separation of the data into the categories of site and practice clarified the findings and gave a rich description of the unique site for the research and the response of educators to teaching outdoors in this case. The findings and analysis will be presented in two chapters: Chapter 4 concerns the analysis and discussion of the setting; and Chapter 5 discusses the participants’ practice in this setting.

3.6 RESEARCH RIGOUR AND LIMITATIONS

Rigour of research involves ensuring the research is ethical, the procedures can be applied or repeated in the future, and the contribution to knowledge aligns with published research. Researcher reflexivity is important to acknowledge in interpretivist qualitative research, and there are limitations to generalisability from employing a single case study method.

The researcher’s professional and personal life experiences are central to the research design. This study was in response to the large body of EfS research that underlies educational policy and curriculums but is neither widely known by school educators or closely aligned with teacher practice (Henderson & Tilbury, 2004; Kennelly, et al., 2012a; Prabawa-Sear & Baudains, 2012; Skamp, 2009a; Summers & Kruger, 2003; Waite, 2010). The researcher focused on the process of teaching outdoors, rather than teaching sustainability, in order to be open to other understandings about the use of outdoor learning activities. The research supervisor, Associate Professor Deborah Heck, is a leader in the field, with significant experience in teaching, writing curriculum documents, conducting and publishing education research (Heck, 2003). This expert advice and support assisted the researcher’s first education research effort.

The researcher sought to conduct a study of just one school because there are few detailed case studies of the process of outdoor teaching in school grounds in Australia (Dyment, 2005b; Skamp, 2009a). The research question required descriptive data, rather than a quantitative report and case studies are considered highly relevant when they investigate an example of best-practice (Barth & Thomas,
The researcher adapted existing data collection instruments from excursion-based outdoor teaching to the school ground setting. The application of EfS pedagogical principles to frame the data analysis supports the researcher’s interpretation and presentation of the findings.

The ethical risk of this study was considered to be low, with a minimal chance of low harm to participants. There was no implied consent in this research, with consent given through completion of the written survey (and interview sample sheet), and additional written consent completed prior to participation in the interview. Participants had the right to withdraw or clarify comments or withdraw from any aspect of the study at any time without penalty. Interviews were arranged at the participant’s preferred time, with refreshments provided by the researcher to reduce the inconvenience to participants.

Interviews were conducted privately throughout the teaching week, and colleagues were not publicly made aware of who chose to participate in the study. Involvement in the research may lead to positive outcomes for participants and enhance teaching for sustainability at the school through professional reflection on outdoor teaching in school grounds. This research design aligns with the Professional Teaching Standards, where reflection on teaching practice is a normal part of staff meetings (Australian Institute for Teaching and School Leadership, 2012; Kennelly, et al., 2012a).

The researcher shared her preliminary survey findings with participants during the interviews, allowing member checking of the data collected and her interpretations of the data to increase validity. Recording of interviews allowed the researcher to verify data and minimise researcher error or misunderstandings (O'Leary, 2010). The research design preserved the confidentiality and anonymity of participants, which was essential as the school is potentially identifiable due to its unique physical characteristics and kitchen garden programme.

3.7 CONCLUSION

EfS research is often framed within an interpretivist perspective, as the primary focus is the relationship between the environment and the behaviour or response of the participants. The researcher chose a single case study design to generate the deeply descriptive data required to answer the question and contribute knowledge regarding the process of teaching in school grounds. Data collection was planned via a written
survey and a follow-up interview, to allow the researcher to confirm initial understandings from the written survey and probe further to clarify details and examples of educators’ responses. This aligns with the theoretical framework of interpretative research.

This research design provided the qualitative data needed to answer the research question, and significantly contributes to knowledge regarding the process of teaching outdoors in school grounds in Australia. It aligns the theory behind teaching EfS outdoors with details of teaching practice in this particular school context. While generalisation to other school contexts may be limited, the research design has the potential to be applied to multiple sites in the future and allow further examination of the process of teaching outdoors.
4. Results and Discussion - Setting

The next two chapters of the dissertation will report the findings and discussion of this research into outdoor teaching practice at Apple State School. During data analysis, the data was separated into two mind maps, and an example of the case setting mind map is attached (see Appendix J). Chapter 4 describes the case study site: the Apple State School setting in Section 4.1, in Section 4.2 the educational philosophy; the school’s culture in Section 4.3, and concluding in Section 4.4 with educators’ beliefs regarding Apple State School’s students. This data explains the specific context for the case study. Chapter 5 describes the educators’ practice in response to this context, with Section 5.1 outlining the educators’ use of outdoor teaching. Section 5.2 examines how educators plan for outdoor learning and integrate it with the class curriculum, and Section 5.3 examines educators’ beliefs about teaching outdoors in this case and the perceived benefits for learners. Throughout these two chapters the findings from this case will be compared to the published literature regarding teaching outdoors. Chapter 6 will summarise the overall findings of the study and the implications for future research.

4.1 THE APPLE STATE SCHOOL SETTING

As mentioned in Chapter 3, Apple State School is set in a semi-rural area, bordered by farms and a forest. All school buildings have established garden beds adjoining them, including six classroom gardens initiated by classroom teachers and parent volunteers and maintained by class groups. The green setting and attractive school grounds were mentioned by several educators as the reason they teach outdoors:

*We have a beautiful and diverse environment* (Carolyn, Survey, 2-3).

Almost all educators reported using at least three different outdoor areas for teaching in the school grounds, including non-natural spaces, such as covered areas outside classrooms and the undercover area near the canteen. Some educators broadened their survey responses during the interview, as they described outdoor teaching activities for various subjects that involved different locations. All educators mentioned using the kitchen garden for outdoor learning except Megan, who only included the oval, amphitheatre and climbing gym as sites for outdoor teaching.
The areas used by educators for teaching outdoors are presented in Table 2:

<table>
<thead>
<tr>
<th>Areas used for Teaching Outdoors</th>
<th>Classroom Educators</th>
<th>Teacher Aides &amp; Principal</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Garden</td>
<td>10</td>
<td>4</td>
<td>14</td>
</tr>
<tr>
<td>Oval</td>
<td>9</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>Forest/bush</td>
<td>6</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>Amphitheatre</td>
<td>7</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>Undercover area</td>
<td>5</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Tennis courts</td>
<td>4</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Other – class gardens, bamboo, planting, water tank/bore, local farms, climbing gym</td>
<td>15</td>
<td>3</td>
<td>18</td>
</tr>
<tr>
<td>N = 15</td>
<td>11</td>
<td>4</td>
<td>15</td>
</tr>
</tbody>
</table>

This data also demonstrates the range of outdoor teaching activities beyond kitchen garden lessons. The exceptional natural environment of the school and wide range of outdoor learning spaces were important reasons participants regularly venture outdoors to teach.

Just a few participants mentioned the contribution of staff, parent volunteers and local community members in maintaining and expanding the grounds over the past decade. The allocation of financial resources is obviously vital to improve and maintain the school grounds, however only Andrea referred to this:

_Everything in our facilities supports the outdoors, from the amount of money that is put aside in relation to things like maintenance and development_ (Andrea, Interview, 2).

Funds for maintaining the kitchen garden and buying resources are generated through harvest and bake sales, and this builds wider community networks, as Block et al. (2012) reported. This will be discussed further in Section 5.4.3.
One new teacher to the school reported using outdoor teaching activities in a different school setting, with considerable barriers that included climate issues, limited resources, minimal staff support and facilities. She contrasted the two settings:

*We could do like the maths stuff and some art things outside and there was some other things like cultural things that we did outside.... So that's a bit different because it was really easy to get on to the right people in the community, but there wasn’t much outside. The grounds weren’t kept as nice as here and that sort of thing* (Suzanne, Interview, 1).

Despite the barriers to outdoor teaching in Suzanne’s previous school setting, she conducted an interdisciplinary garden unit, with students and community volunteers cooking and sharing healthy food that included links to literacy, maths and science curricula. Suzanne’s reflections are valuable for educators in other less-than-ideal settings, as outdoor teaching can still be incorporated into practice through the use of local community links and establishing less ambitious kitchen garden projects to enhance learner engagement across the curriculum.

The green school grounds at Apple State School are a product of the school’s environmental philosophy and support both formal and informal engagement with nature (Malone & Tranter, 2003a). The priority given to improving outdoor spaces is indicative of the wider culture at Apple State School, and supports the use of the environment as an integrating context at the school.

### 4.2 EDUCATIONAL PHILOSOPHY

Apple State School’s pedagogical approach includes an interdisciplinary approach to learning with an emphasis on participatory relationships between students, staff and the community. The holistic philosophy emphasises providing a broad community of learners with strong connections to the local community, which in turn results in a pedagogy of “responsible uncertainty” as educators hand control of learning over to volunteers and let students lead learning (Somerville & Green, 2011). The school philosophical statement explicitly supports EfS and Apple has received awards for its’ inclusive community environmental programmes.

There was little mention by classroom educators of an overall plan for the implementation of cross-curriculum sustainability at Apple, but educators are aware
of EfS and incorporate EfS principles within their teaching and unit plans. These will be further discussed in Section 5.4. Several educators mentioned Apple being a “sustainable school”, however only one direct reference was made to the School Environmental Management Plan (SEMP), which is supposed to guide the implementation of EfS (Australian Government, 2011). One educator mentioned whole school sustainability (WSS), in response to the survey question regarding how outdoor activities are integrated across curriculums:

*Through whole school approach* (Russell, Survey, 1).

This was not elaborated further as Russell gave incomplete responses and chose not to participate in an interview. When queried regarding teaching sustainability, most educators mentioned the lunchtime waste management practices:

*That attitude and philosophy that you don’t bring litter to school… Then once you get outside, what do you do with the food that we are bringing? The compost organic compost, worm farms, those sorts of things, which the whole school contributes to…* (Andrea, Interview, 1).

Fiona mentioned the school being “green”, but this was in respect to the use of participatory and inquiry-based teaching strategies such as mind-maps, rather than because of WSS. Only Andrea mentioned sustainability as a cross-curriculum priority and that teachers incorporate this to varying degrees within their units:

*With the Australian Curriculum now, one of the cross-curricular priorities is sustainability. So when teachers plan units, we do have that aspect of sustainability and some units are stronger and other may just touch on it, but it is always part of the unit process* (Andrea, Interview, 3).

Despite not explicitly including sustainability in their responses, many of the outdoor teaching activities described by educators employ EfS pedagogies and content (see Table 6 Interdisciplinary Unit Examples). The educational philosophy and collaborative teaching practices at Apple State School’s incorporate the principles of EfS and resulted in a culture that supports Apple teachers to regularly teach outdoors.

### 4.3 SCHOOL CULTURE

Educators acknowledged Apple State School is different to other educational settings:
Sometimes you have new teachers come in and you talk about being ‘Apple-ised’ and how we all work as a team and everyone’s supportive of everyone else and we use that same type of language. So when you are new to the school it takes a little while to take all of that on board (Carolyn, Interview, 4).

This collaborative, cooperative approach to teaching, or school culture, supports the educational philosophy of the school and demonstrates the principles of EfS. Going outdoors for lessons is considered normal practice at Apple State School, although it is not explicitly mandated:

*Not from [the principal’s] expectations … It is not written down anywhere it is just what we do* (Suzanne, Interview, 3-4).

Real life learning activities are central to unit planning and often shape the unit or topic, with investigations conducted outdoors.

The culture of teaching outdoors is apparently well embedded in the educators who participated in this study. The newer educators at the school seem to have adapted to the, with no clear differences between their responses and those of educators who had been at the school for over ten years. Because of the normalcy of outdoor teaching and learning, educators found it difficult to separate indoor and outdoor classroom modes of delivery and management strategies:

*It’s not a special trip, it’s an extension of your room* (Carolyn, Interview, 5).

Carolyn offered insights into the outdoor teaching culture of Apple State School, feeling pity for teachers elsewhere who are not supported by their school culture to go outside to learn. Her husband teaches in a nearby school:

*He’s in a really big school and not so much encouraged to get out there. They don’t find it as easy because it’s just not as familiar to them* (Carolyn, Interview, 5).

When questioned regarding the other school’s physical setting, Carolyn concluded that despite there being similar areas for teaching outdoors at the other school, including a forest and a vegetable garden, it was the culture that was different:

*I just don’t think it’s quite to where we are at here* (Carolyn, Interview, 5).

Apple State School staff display the culture of trust that facilitates the open
discussion and negotiation required for the implementation of EfS in schools. Educators have overcome the barriers of time and money, staff resistance and limits to conceptual understanding reported in the Far North Queensland case study (Evans, et al., 2012). No Apple educators reported being perceived as a “greenie” or a lack of peer support. Carolyn felt strongly that a green natural environment was insufficient alone to encourage outdoor teaching, and it was the social aspects of the Apple school culture that supported regular outdoor activities.

The entire school community has worked hard over many years to create and maintain the attractive school grounds and facilities. The school vegetable garden was initially established by parent volunteers more than 10 years ago as a lunch-time garden club, and its’ long-term sustainability is due to the dedicated volunteers and wider community support for labour and supplies. One educator outlined how two parents worked tirelessly to build the first garden, which was then relocated due to the construction of school buildings. The school community built a larger garden in another area of the school and continues to extend garden areas across the school grounds. During the research, a working bee was conducted during school-time with community volunteers, educators and students working together to re-landscape an area of banana trees between classrooms. Conducting this event during a school day demonstrates the priority that Apple State School places upon outdoor projects as a formal part of the curriculum, rather than an extracurricular activity.

The principal’s role is fundamental to the outdoor learning culture and facilities at Apple State School, however only Kate acknowledged this. She reflected on the change in school culture once the principal became aware of the educational potential of outdoor learning:

*The attitude of the whole school changed after the principal attended the kitchen garden presentation and kitchen garden activities were timetabled and experts paid to deliver programme* (Kate, Interview, 1).

The school received a grant to build and equip a teaching kitchen, and committed ongoing school funding for a kitchen specialist and a garden specialist to conduct regular kitchen garden classes. School community members with professional gardening and cooking experience filled these roles, in a teacher aide capacity. The enabling Principal and trust between staff regarding this new innovation, allowed the kitchen garden project to be established. The school’s provision of lesson time and
resources is fundamental to the project’s on-going sustainability. Year Four to Seven students attend fortnightly kitchen and garden classes, and the paid specialists coordinate and deliver the programme. Surprisingly, few educators mentioned the kitchen garden programme as a reason they regularly teach outdoors, despite the obvious importance of the project in promoting outdoor teaching and learning.

The kitchen garden has become an integral part of the curriculum, rather than a nice feature in the school grounds. Classroom educators do not lead kitchen garden lessons, instead supporting specialist teacher aides and volunteers to deliver the project. This role delineation is evident in educators’ responses regarding planning for outdoor learning activities and is discussed in Section 5.2.1. It appears that since the beginning of the kitchen garden project, classroom teachers now venture outdoors more often and regularly integrate indoor and outdoor learning into their teaching practice. The culture of teaching outdoors at Apple is clearly supported by the kitchen garden programme, which has provided educators with rich outdoor teaching and learning experiences that incorporate the strategies of effective EfS.

4.4 APPLE STATE SCHOOL STUDENTS

Several educators mentioned that Apple State School students are a little bit different to the norm, for a variety of reasons:

*It’s just the clientele that come here. A lot of parents, who want something different, select to come here* (Anna, Interview, 3).

Educators reported that Apple students generally love to go outside for learning and therefore tend to behave well outdoors. Enjoyment by students was mentioned repeatedly, with educators believing that students learn better outside because they are happy and more engaged in outdoor learning tasks:

*Basically they don’t realise its schoolwork when they’re outside* (Anna, Interview, 2).

This enjoyment was reflected in students’ motivation to learn and application to academic tasks on returning to the classroom:

*They really get engaged when it is real life ... a lot of kids who wonder what it is or what bug, they come in and we Google it and follow up* (Fiona, Interview, 2).
Thus learning outdoors motivated learners and the quality of their class work improved when students were engaged in real life tasks. These findings are in agreement with the school gardening and teaching outdoor literature (Blair, 2009; Fägerstam & Blom, 2013).

There is no reported evidence of Apple students struggling to cope with outdoor learning activities; on the contrary, educators reported that outdoor activities were essential to meeting their students’ needs. Educators at Apple State School reported the outdoor setting engages and motivates at-risk students, such as those who dislike school:

Some of them come with a negative idea of school, if you can get them outside of the four walls they enjoy themselves more which means we can do more teaching and learning and get more out of it (Anna, Interview, 2).

A preference for the outdoor learning environment clearly promotes learner engagement and motivation (Norddahl & Einarsduttir, 2014). Perhaps unsurprisingly, some learners who excel indoors with traditional teacher-directed learning can initially find the more open style of learning outdoors a challenge:

Your intrapersonal, sometimes they struggle a little bit in the outdoors because it is more self-managed, creative within the way it is structured, there is more opportunity to think outside the square (Bronwyn, Interview, 3).

Educators believed it was important to take these students out of their comfort zone to extend their learning experiences. Two educators reported that some children found it challenging to go outside because their very sedentary lifestyles meant that they have little experience with the natural environment and physical activity:

[they] probably have never been pushed from home to be very active, to be outside often, so I think probably one of the only opportunities they get is here at school (Geoff, Interview, 3).

This echoes the literature regarding children being unfamiliar and potentially fearful of the natural environment and the important role of schools in providing outdoor experiences for children (Dyment, 2005b). Apple educators believe schools should offer outdoor learning opportunities for such students and reported success in addressing some children’s lack of nature experience:
[Going outdoors] takes them out of their comfort zone and you start to see significant changes where they start to come a little bit more outside of the square, thinking more laterally (Bronwyn, Interview, 3).

The majority of educators did not comment on this type of student and their prevalence may be higher in urban contexts. Catering for learner diversity was a common reason educators gave for taking learning outside.

Several educators mentioned that there are a lot of students with learning difficulties at Apple State School, and that outdoor teaching is essential to address their learning needs:

*We’ve also got here a lot of ASD kids* (Geoff, Interview, 3).

*You look at the diverse needs ... especially in Apple’s diversity of needs within any given class, some students really don’t work as well within the classroom scenario as soon we step out into the outside areas or into the kitchen, you can straight away notice that they can work a lot more productively* (Bronwyn, Interview, 2).

The diverse learners, who are often challenging in the classroom, are more engaged when learning outdoors. This leads to social benefits for the class as a whole, as students see different children excel when learning outdoors:

*Different children perform differently in variety of contexts or environments* (Jane, Survey, 1).

These beliefs are an important reason educators use outdoor learning activities regularly:

*... catering for diversity and inclusivity of all students [means] that we take groups out and step outside of the classroom. It enriches their learning* (Bronwyn, Interview, 2).

*And it means too when you come back in and those kids are having to sit and listen and focus for a long period of time, because of that physical activity outside [it] has settled them, more times than not* (Geoff, Interview, 3).

These findings that less-academic or at-risk students may gain significantly more from outdoor learning correlate strongly with the literature (Block, et al., 2012; Dyment, 2005b; Louv, 2005). Educators at Apple are very aware of the benefits from
outdoor teaching for all of their learners and this motivates them to take learning outside more often.

4.5 CONCLUSION

The physical and socio-cultural setting of Apple State School includes many of the enablers for a successful outdoor teaching programme: a green semi-rural school grounds, a pro-environmental school philosophy, resources for an ongoing kitchen garden programme, enthusiastic and experienced educators, Principal support, strong community links and an explicit school philosophy to include real-life learning experiences and environmental practices. Combined with the school culture of teaching outdoors, these factors support many educators at this school to regularly plan outdoor learning experiences. The educators’ practices in response to the physical and social setting of Apple State School provide insight into the process of outdoor learning, and will be examined in Chapter 5.
5. Results and Discussion - Practice

This chapter outlines how Apple State School educators respond to the setting described in Chapter 4 and compares the findings to the literature reviewed in Chapter 2. This chapter will begin in Section 5.1 by examining how outdoor teaching is used. Section 5.2 will examine how educators plan for outdoor learning and integrate it with the class curriculum. Section 5.3 examines educators’ beliefs about teaching outdoors, why it is used and the benefits for learners. Section 5.4 evaluates whether outdoor teaching may support the delivery of EfS at Apple.

5.1 HOW IS OUTDOOR TEACHING USED AT APPLE STATE SCHOOL?

This section will outline how the educators in this study use outdoor teaching. Section 5.1.1 will describe the frequency of outdoor teaching. Section 5.1.2 explains the learning areas taught outside and examples of lesson activities. Section 5.1.2 discusses outdoor teaching strategies and delivery modes, and finally in Section 5.1.3 the experience-based learning activities used at Apple will be described.

5.1.1 FREQUENCY OF OUTDOOR TEACHING

Table 3 refers to the frequency of outdoor teaching at Apple State School. It became clear during the research that the frequency of outdoor teaching was not over-reported. In the interviews, educators described integrating outdoor activities at the initial stage of unit planning because real life practical activities were valuable to engage diverse learners and improve learning outcomes. This integration and planning for outdoor learning will be further discussed in Section 5.2.1. All educators at Apple State School teach outdoors at least two

<table>
<thead>
<tr>
<th>Frequency teach outdoors</th>
<th>Classroom Educators</th>
<th>Teacher Aides</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 / week</td>
<td>8</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>2-3 / week</td>
<td>2</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>N = 13*</td>
<td>10</td>
<td>3</td>
<td>13</td>
</tr>
</tbody>
</table>

*No data from the Principal or Russell
days per week, thus there is regular outdoor teaching beyond the fortnightly garden lessons. The daily outdoor teaching of eight classroom educators, out of a sample of 11, is in contrast with the literature findings regarding infrequent outdoor learning in schools (Waite, 2010). The frequency of outdoor teaching at Apple also exceeds the weekly lessons often reported to promote health and academic benefits, as well as improved school attendance and pride (Block, et al., 2012). The two educators who “only” taught outdoors two or three times per week included Megan. An experienced educator, Megan was a newcomer to the school and the only participant to report a reason for not teaching outdoors:

*Don’t teach outdoors sometimes because we have too much to finish and I’m not a PE teacher* (Megan, Survey, 1).

This echoes the common barriers to teaching outdoors of time and curriculum constraints, as well as teacher experience and perceived competency (Dyment, 2005b; Ozer, 2007; Skamp, 2009b). Despite this reticence, Megan also included positive responses regarding the benefits of teaching and learning outdoors, as the breadth of the topic became more apparent during the survey:

*Good for poetry and creative writing, experiencing something that is in the curriculum for science and SOSE, sensory therapy* (Megan, Survey, 1).

The regular outdoor teaching at Apple State School indicates that most educators in the study are comfortable with using the strategy. Their daily outdoor teaching practice demonstrates understandings of the strategy and the ability to vary and generalise it to their teaching and curriculum needs (Skamp, 2009b). Educator’s use of outdoor teaching was classified using the categories used by Skamp (2009b) and this will be discussed in the next section.

### 5.1.2 LEARNING AREAS TAUGHT OUTDOORS

The learning areas or subjects taught outdoors at Apple State School are summarised in order of frequency in *Figure 4*. Maths and Science were taught outdoors by almost all educators, with 11 educators also teaching HPE and Literacy outdoors. The survey listed various subject options and space for “Other” responses, with 10 participants added “Gardening” as a learning area.
The inclusion of gardening as a subject emphasises the importance of the kitchen garden programme within the school and its close link to educators’ understandings of outdoor teaching. The status of gardening at Apple State School is further enhanced by its inclusion in the report card:

*We deliberately put that into the report card for Year 4’s to 7’s, around about attitudes and participation ... skilling and knowledge.* (Andrea, Interview, 4).

Two educators reported teaching just one or two learning areas outdoors in the survey data, but extended the number of subjects when responding to interview questions. Table 4 summarises the outdoor learning activities reported by educators, classified by learning area. The majority of respondents described teaching science outside, when first asked for an example of an outdoor teaching activity:

*We are never inside for science* (Carolyn, Interview, 2).

*Figure 3.* Learning areas taught outdoors

* Russell did not respond to this item.
Table 4 *Outdoor Learning Activities*

<table>
<thead>
<tr>
<th>Learning Area</th>
<th>Activities</th>
</tr>
</thead>
</table>
| Mathematics   | • Mapping school grounds  
                • Designing and planning class gardens  
                • Trundle wheel measuring distances  
                • Estimating first, then measuring outside  
                • Calculating area and perimeter of garden  
                • Calculating volume of raised garden beds  
                • Finding symmetry in nature |
| Science       | • Case study – problem and solution  
                • Life cycle of plants  
                • Erosion and soil pH experiments  
                • Water sources – bore, rain tanks and creek  
                • Scientific diagrams and labelling  
                • Shadows and light investigations  
                • Friction tug of war  
                • Investigation into types of soils and rocks  
                • Classification of living things |
| Literacy (English) | • Raps about the garden  
                   • Writing prompts using senses outside  
                   • Poetry and creative writing  
                   • Compost as part of procedural genre  
                   • Letter-writing to future self for time-capsule |
| Other - Gardening | • Working in the garden  
                    • Growing food  
                    • Using triangular numbers when planting |
| Art           | • Bush collage using natural materials  
                • Sketching |
| SOSE (Studies of Society and the Environment) | • Endangered local animals  
                    • Understanding the local area |
| Health & PE   | • Digging using big muscles in the garden |
| History       | • Getting the feel of the olden days |
We’ve gone into the garden up there and looked for mini-beasts and stuff like that with the whole class. Because of the Grade 4’s [kitchen garden program]… they looked at compost and what bugs they found in there and so on. We actually got the class to go up after that lesson and [got the Year 4’s to] teach the other kids because they were all empowered (Fiona, Interview, 4).

The second response demonstrates the participatory nature of outdoor teaching at Apple State School. Peer teaching is a strategy that supports effective EfS delivery. Opportunities for interdisciplinary learning opportunities, such as linking science with sustainability and literacy, are often mentioned by educators and will be discussed further in Section 5.2.3.

All educators reported teaching maths concepts outside and this was primarily due to two main factors: the motivation of a “real-life” context for learner motivation, and enhanced theoretical understandings through practical hands-on activities.

*Kids have to see a purpose for it if they don’t see it they will just switch off. And lots of maths is abstract and its easy for us to go straight through the abstract and don’t explore the practical side of maths and where you see it in real life* (Geoff, Interview, 2).

Mathematics principles and formulas are reinforced through outdoor learning activities, especially the application of maths concepts such as area or perimeter. An early primary educator built a class garden as part of a maths unit:

*The garden to the front here, we actually started it as a maths activity and we did all the measuring of area and integrated it right in through the whole maths curriculum* (Carolyn, Interview, 1).

Geoff described three phases to maths lessons that include a game component to engage and energise students before the teaching and learning focus, followed by an independent or investigation stage:

*I often use that game period to go outside and play a game to get the kids interested in what we’re doing ... they’re having to think but they’re engaging their body and being active as well...[rather than] just sitting and doing that same type of activity* (Geoff, Interview, 2).

Geoff’s unusual pedagogical approach, engaging students by using outdoor physical activity while performing arithmetic skills, has not been reported elsewhere.
Outdoor settings are used as a stimulus for literacy at Apple State School, as a topic for creative writing and for student reflections on science understandings:

*We use outside for writing prompts and things like that as well...They’ve done writing reflections on it using science literacies and science, and their own thoughts and feelings about it as well* (Carolyn, Interview, 1).

These written activities support the delivery of EfS through the inclusion of emotional responses to outdoor experiences (Eilam & Trop, 2010; Tooth & Renshaw, 2009). Outdoor projects, such as class gardens or the time capsule project (see Table 6), often incorporate literacy skills with letter-writing and procedural texts linked to the outdoor activity or theme.

As shown in Table 4, maths and science teaching examples were most commonly reported during the research, while educators rarely mentioned teaching the creative arts outdoors. Outdoor SOSE examples were also rare, and although sustainability practices are embedded in permaculture gardening and waste management at this school, no educators mentioned a link between the SOSE curriculum and sustainability. Eleven educators taught Health and Physical Education (HPE) outdoors and all educators selected Physical Activity as a teaching strategy used outdoors (see Figure 5). There is no specialist HPE teacher at Apple State School, thus classroom educators lead the “Smart Moves” daily activity programme

![Figure 4. Teaching strategies used outdoors.](image)

(Department of Education and Training, 2012). Despite this strong emphasis on HPE and physical activity in the written survey, during the interviews only Geoff mentioned the HPE curriculum, while Kate referred to HPE in reference to gardening and digging (see Table 4).
5.1.3  **TEACHING STRATEGIES USED OUTDOORS**

The research sought to compare the process of teaching outdoors in a school with the process of fieldwork teaching. In Ballantyne and Packer’s (2008) outdoor education centre study, research assistants classified the teaching delivery modes and pedagogies used in outdoor teaching programmes. In this research, the survey used the same terms as the fieldwork study and required educators to make their own judgements on the strategies they use outdoors.

Apple educators commonly reported using six strategies outdoors, including: Field Investigation; Physical Activity; Games or Play; Creative/Reflective Responses; Discussion or Debate, and Worksheets (see Figure 5). These findings indicate that similar teaching activities are undertaken in this school context and the outdoor environmental education programmes (Ballantyne & Packer, 2008). The regular use of Worksheets indicates that educators use both teacher-directed and inquiry-based learning strategies outdoors, in line with the research on effective EfS pedagogies (Eilam & Trop, 2010; Skamp, 2009a). The common use of Games or Play and Physical Activity aligns with the regular HPE, and Field Investigations closely correlate with outdoor science and maths activities. The Creative/Reflective responses were often used to link indoor and outdoor learning. It is interesting that Drama and Story was reported so rarely, perhaps due to Apple’s educational focus on real-life learning or an oversight from participants.

The variety in delivery modes meant educators use a range of individual, small and whole class groupings for outdoor learning activities, as they do in the classroom. Close integration of indoor and outdoor learning strategies is apparent from educators’ responses regarding behaviour management, which will be discussed in Section 5.3.3. The Experience-based Learning modes identified by Ballantyne and Packer (2009) were widely used in this school, providing further evidence for the notion that outdoor teaching in school grounds may facilitate the goals of EfS through the use of similar teaching strategies and learning experiences.

5.1.4  **EXPERIENCE-BASED LEARNING**

Table 5 outlines the Experience-based Learning modes (Ballantyne & Packer, 2009) used when teaching outdoors at Apple State School. All educators reported using Learning by Doing, Being in the Environment and Real Life Learning, and these modes closely align with the school’s educational philosophy and focus on learning for life.
### Table 5 Experience-based Learning Modes Used Outdoors

<table>
<thead>
<tr>
<th>Experience-based Learning mode</th>
<th>Classroom educators</th>
<th>Teacher aides</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning by Doing</td>
<td>11</td>
<td>3</td>
<td>14</td>
</tr>
<tr>
<td>Being in the Environment</td>
<td>11</td>
<td>3</td>
<td>14</td>
</tr>
<tr>
<td>Real Life Learning</td>
<td>11</td>
<td>3</td>
<td>14</td>
</tr>
<tr>
<td>Sensory Engagement</td>
<td>10</td>
<td>2</td>
<td>12</td>
</tr>
<tr>
<td>Local Context</td>
<td>10</td>
<td>2</td>
<td>12</td>
</tr>
<tr>
<td><strong>N = 14</strong>*</td>
<td>11</td>
<td>3</td>
<td>14</td>
</tr>
</tbody>
</table>

*No data from the Principal, Russell responded to this item.

Diana described teaching about forces using Real Life Learning in a science unit:

*We looked at ... how we could reduce friction, so one team had their hands and one team had gloves and we put soapy water on their gloves. They both pulled at the rope and one team won easily, which we expected, and then we changed the rules for them and it was interesting learning about forces and unbalanced forces. They got it because we had lived it.* (Diana, Interview, 1).

Geoff explained the enhanced student motivation of Real Life Learning, when teaching the concept of volume in maths using examples within the school grounds:

*I could see the kids’ level of interest change as soon as I started talking about the garden* (Geoff, Interview, 2).

The increased motivation and engagement of students with Real Life Learning aligns with Skamp’s (2001) findings about learnscapes, and clearly encourages Apple educators to use the environment as an integrating context and use outdoor experience-based learning activities when planning their units. Planning for outdoor learning is further discussed in Section 5.2.1.

**Learning by Doing** is fundamental to education at Apple State School, with children exploring and using hands-on activities to apply abstract concepts both indoors and outdoors. Learning by Doing in kitchen garden classes provides children with skills for a healthy life, with students selecting and harvesting produce, preparing and cooking the entire meal, and cleaning up and disposing of waste back to the garden compost at the end of the session.
Although not literally “outdoors”, kitchen classes are out of the classroom, and students identify and collect produce and dispose of scraps in the garden in each lesson. Educators reported that incorporating sustainable actions regularly supports students’ capacity for future sustainability behaviours, allowing them to “walk the talk” about EfS:

*The experiences and learning from garden activities leads to sharing and teaching among children and practicing environmental behaviours (Kate, Survey, 1).*

Apple educators believe that time spent learning and being outdoors is an essential part of fostering environmental attitudes and empathy.

Being in the Environment, and gardening activities specifically, was considered to support future environmental action taking:

*Children become more aware of their environment, the more time they spend outside. This can lead to greater concern and care for the environment (Geoff, Survey, 1).*

These beliefs will be discussed further in Section 5.3.2. The educators’ responses align with Chawla and Flanders-Cushing’s (2007) research describing childhood nature experiences as pre-cursors to environmental empathy and supporting future action taking. Educators consider it essential for schools to give children opportunities to engage with nature at school, especially those students who have little outdoor experience:

*[Some children] probably have never been pushed from home to be very active, to be outside often, so I think probably one of the only opportunities they get is here at school. (Geoff, Interview, 3).*

*Interacting with the environment helps students feel safe in nature and then they are better able to appreciate the environment (Suzanne, Survey, 1).*

This is in agreement with Louv’s (2009) concern regarding children’s limited nature experiences and supports Dyment’s (2005b) call for schools to provide such opportunities.

The pedagogies of Sensory Engagement and Local Context were used outdoors by 12 educators. Bronwyn richly described Sensory Engagement outdoors:

*We sit them sometimes out in the amphitheatre and put them in different places out in the garden, ... and ... harness the environment’s natural sounds, natural feel and then put that into their creative writing (Bronwyn, Interview, 1).*

The use of Local Context included activities both within and beyond the school grounds:
Looking at adaptations of plants in the school grounds and their environment (Suzanne, Survey, 2)

Understanding from strawberry farms in the area: [children ask] where summer fruit comes from, since farms have no plants (Kate, Survey, 3).

The interdisciplinary unit plan examples in Section 5.2.1 further demonstrate the range of outdoor teaching strategies and experience-based learning used at Apple State School.

5.1.5 CONCLUSION

The educators in this research incorporate outdoor teaching into their regular practice. A variety of learning areas are taught outdoors using a range of effective EfS strategies, including Experience-based Learning modes. These practices support positive learner outcomes and broad curriculum delivery and EfS through regular hands-on learning in the local natural environment. Section 5.2 will describe the implementation of outdoor teaching at Apple State School.

5.2 IMPLEMENTING REGULAR OUTDOOR TEACHING ACTIVITIES

As explained in Section 5.1, the majority of Apple State School teachers venture outdoors daily to teach a range of subjects and use Experience-based Learning strategies outdoors. Section 5.2 will examine the process of teaching outdoors, or how this regular outdoor teaching is delivered within the constraints of a state primary school setting. Section 5.2.1 will examine how outdoor teaching and learning is planned and Section 5.2.2 will discuss the integration of indoor and outdoor curriculums. Section 5.2.3 will discuss educators’ use of interdisciplinary outdoor learning or EIC. Section 5.3 examines the factors supporting regular outdoor teaching at Apple State School.

5.2.1 PLANNING FOR OUTDOOR LEARNING

Educators at Apple appear confident with planning outdoor learning activities and comfortable with linking their class’s units to learning opportunities observed in the kitchen garden classes. Garden and cooking specialists are kept informed of class units of work and potential links are explored collaboratively with classroom educators. Occasionally, specialist teacher aides may be requested to tailor lessons specifically to class topics, however this was not widely reported. There was no mention of any difficulties with planning for outdoor learning or safety concerns with teaching outdoors.
Outdoor teaching activities are central to collaborative unit planning at the school, as educators seek ways to engage learners with real life contexts within their green school grounds:

*Other areas of learning space are needed so outdoors is useful. Multi-age philosophy for planning and teaching* (Jane, Interview, 1)

*Integration happens regularly in all areas of my planning as the outdoor resources and environments are great and readily available.* (Anna, Survey, 2).

*Our units of work are always ‘real life’ based and outside activities ensure students see real examples of what we are talking about in class* (Fiona, Survey, 2).

Educators mentioned increased motivation and enjoyment when using real tasks instead of hypothetical simulations. When planning the unit Beneath Our Feet (see Table 6), originally a Curriculum to Curriculum (C2C) science unit on soil and landscapes, educators decided to change a hypothetical mapping task into a real time-capsule activity, with students involved in all aspects of burying a time capsule in the school grounds for the next 25 years:

*We think if we’re not excited about it, they’re not going to be* (Fiona, Interview, 3).

The focus on real life tasks often necessitates an interdisciplinary approach to curriculum; as such tasks are not restricted to traditional subject disciplines. Beneath Our Feet included a variety of learning areas, such as tabulating survey results, fund-raising, letter-writing for permission, design of the time capsule, presentation to the school and so on. Interdisciplinary learning will be further discussed in Section 5.2.3.

Educators occasionally collaborated with specialists to include curriculum content in garden lessons, but more commonly classroom educators either incorporated kitchen garden knowledge into their unit planning, as in the My Dream Backyard unit, or took learning outdoors to enhance conceptual understandings, as in the early primary unit, No Tree, No Me:  

*They looked at the growth stages of plants and when they went into the garden they were obviously tying or making links between what they were learning in the classroom and out there, and we really saw that ... science understanding, tying or making links between what they were learning in the classroom and out here* (Fiona, Interview, 3).
<table>
<thead>
<tr>
<th>Unit</th>
<th>Learning activities</th>
<th>Learning areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beneath Our Feet</td>
<td>• Rocks, soil and landscapes and how they change over time: sand pits and different soils</td>
<td>Science</td>
</tr>
<tr>
<td></td>
<td>• Change over time with time capsule</td>
<td>SOSE / Sustainability</td>
</tr>
<tr>
<td></td>
<td>• Mapping school grounds</td>
<td>Maths</td>
</tr>
<tr>
<td></td>
<td>• Time capsule sketching</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Selection of site for time capsule [Learnscape]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Cause and effect futures mind mapping</td>
<td>Art</td>
</tr>
<tr>
<td></td>
<td>• Timelines for future education, work, family etc</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Research time capsule costs and fundraiser</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Surveying and persuasive writing for permission</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Letter to future-self</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Sand pits and different soils</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Change over time with time capsule</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Mapping school grounds</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Time capsule sketching</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Selection of site for time capsule [Learnscape]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Cause and effect futures mind mapping</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Timelines for future education, work, family etc</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Research time capsule costs and fundraiser</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Surveying and persuasive writing for permission</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Letter to future-self</td>
<td></td>
</tr>
<tr>
<td>Erosion</td>
<td>• Case study on erosion</td>
<td>Science</td>
</tr>
<tr>
<td></td>
<td>• Looking for areas affected by erosion in school grounds</td>
<td>Sustainability</td>
</tr>
<tr>
<td></td>
<td>• Erosion experiments – water at different heights falling on different surfaces [Learnscape]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Making an action plan to reduce erosion [Sustainability Action Process]</td>
<td>Literacy</td>
</tr>
<tr>
<td></td>
<td>• Hypothesise what would happen over time</td>
<td>Maths</td>
</tr>
<tr>
<td></td>
<td>• Manage and control an erosion problem</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Evaluate whether that strategy was working</td>
<td></td>
</tr>
<tr>
<td>No Tree, No Me</td>
<td>• Tree habitat mind maps</td>
<td>Science</td>
</tr>
<tr>
<td></td>
<td>• Plant life-cycle diagram</td>
<td>Art</td>
</tr>
<tr>
<td></td>
<td>• Growing plants from seed</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Tree animal/bird/insect investigation</td>
<td>Literacy</td>
</tr>
<tr>
<td>Unit</td>
<td>Learning activities</td>
<td>Learning areas</td>
</tr>
<tr>
<td>-------------------------</td>
<td>--------------------------------------------------------------------------------------</td>
<td>-------------------------------------</td>
</tr>
<tr>
<td>My Dream Backyard</td>
<td>• Use permaculture design knowledge from Gardening in a real life (future) task</td>
<td>• Sustainability</td>
</tr>
<tr>
<td></td>
<td>(future) task [Learnscape]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Measure school garden features and elements</td>
<td>• Maths</td>
</tr>
<tr>
<td></td>
<td>• Plan a permaculture garden with sustainable water source</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Map own backyard as the future site</td>
<td>• Integrated Computer Technology</td>
</tr>
<tr>
<td></td>
<td>• Use ICT to map and research garden elements</td>
<td>(ICT)</td>
</tr>
<tr>
<td></td>
<td>• Map to scale a realistic dream backyard</td>
<td>• Art</td>
</tr>
<tr>
<td></td>
<td>• Build 3D model of dream backyard</td>
<td></td>
</tr>
<tr>
<td>Shadows and Solar Energy</td>
<td>• Observation of shadows in school grounds over the course of the day</td>
<td>• Science</td>
</tr>
<tr>
<td></td>
<td>• Light sources and movement of the sun</td>
<td>• Sustainability</td>
</tr>
<tr>
<td></td>
<td>• Solar energy</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Presentation on a renewable energy source [Sustainability Action Process]</td>
<td>• ICT</td>
</tr>
<tr>
<td></td>
<td>• ICT research on history and characteristics of a chosen renewable energy</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Evaluation of positives and negatives, costs, environmental impact, immediate and future benefits</td>
<td>• Maths</td>
</tr>
<tr>
<td></td>
<td>• Recommendations for future home energy choices</td>
<td>• Literacy</td>
</tr>
<tr>
<td>Class Garden</td>
<td>• Measurement and perimeter of garden bed [Learnscape]</td>
<td>• Maths</td>
</tr>
<tr>
<td></td>
<td>• Soil analysis and type [Sustainability Action Process]</td>
<td>• Science</td>
</tr>
<tr>
<td></td>
<td>• Compare plant habitats around school</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Parent volunteer expert advice and labour</td>
<td>• Sustainability</td>
</tr>
<tr>
<td></td>
<td>• Planning, planting and caring for garden</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Establishing compost, using class’s food scraps</td>
<td>• Literacy</td>
</tr>
<tr>
<td></td>
<td>• Compost procedural text</td>
<td></td>
</tr>
</tbody>
</table>
It was assumed that the specialists and classroom educators planned integrated outdoor lessons together, however there was little evidence of this being formally done. Andrew mentioned educators extending garden lessons further, and there was some evidence of this:

*Teachers cue from hands on learning experiences in the garden to support curriculum and connect with authentic or real life knowledge* (Andrew, Survey, 2).

Kate gave an example of integrated indoor/outdoor planning that had occurred several years earlier at the beginning of the kitchen garden project:

*The teacher approached the garden teacher for assistance with planning a procedural text that included science experimentation process, literacy, measurement, water cycle, drawing observations and graphing results etc.* (Kate, Survey, 4).

The classroom educator concerned did not mention this collaboration and now demonstrates confidence with planning outdoor teaching activities for a variety of learning areas on a daily basis.

The kitchen garden programme and class curriculums seem to co-exist independently rather than being explicitly linked at Apple State School. Kate referred to garden lessons being structured around the needs of the vegetable garden and the focus being deliberately off both learner outcomes and the curriculum:

*Changing focus from kids and curriculum to the garden as the major concern ... Care for garden first and it will provide for us and we can learn so much about [the] environment* (Kate, Interview, 1-2).

Kate found that after initially trialling the lesson plan materials provided by the project provider, better outcomes occurred when the garden and its needs led the curriculum. Diverse learning opportunities and teaching moments constantly arise during garden classes, as noted by Blair (2009), however following a prescribed lesson plan meant that the needs of the garden were not being met and these learning opportunities were not being taken. Although indoor and outdoor curriculum integration remain important, the kitchen garden project is not sustainable without a productive garden. The pedagogy that results from the garden leading outdoor learning is a pedagogy of responsible uncertainty (Somerville & Green, 2011), and Apple educators highly value the rich, unplanned learning that occurs outdoors, in agreement with Block et al.’s (2012) multiple case study research.
Most educators appear to teach outdoors regularly because outdoor teaching activities are included in the early planning stages of units. This is a “Production” level of understanding of an innovation, where the “teacher is able to synthesise and develop contextualised lessons incorporating the new strategies” (Skamp, 2009b, p. 96). The personalisation of the strategy indicates that most Apple educators may be classified as Innovators (see Table 7). Two educators, Anna and Megan, were classified as Succeeders moving towards Innovators. Anna and Megan reported barriers to outdoor teaching, and given the rarity of this response, it was decided they could not yet be classed as Innovators, although their understandings of outdoor teaching were independent of curriculum materials.

The findings in this case contrast greatly with those of Skamp’s (2009b) investigation into the use of learnscapes, where only two of eight educators were classified as Innovators. This was despite that school receiving support from the principal, government funding and professional development resources to include learnscapes in their regular teaching practice. Apple State School educators have clearly personalised the strategy of teaching outdoors and do not report relying on the specialist teacher aides or curriculum materials to lead or guide their use of it.

5.2.2 INDOOR-OUTDOOR INTEGRATION

At Apple State School, outdoor activities are used in sequence with indoor teaching:

*It’s good in linking following activities. So we usually do it as a lead-in to the experiments and stuff so it is linking into a concept and then linking it back. They always remember the hands-on stuff that we’ve done* (Suzanne, Interview, 3).

The integration of indoor and outdoor learning is a major reason Apple educators teach outdoors, to support learning across the curriculum:

*There is the integration of curriculum as well. You can then look at your maths, your sciences and language and those sorts of things, which are all related to using outside* (Andrea, Interview, 1).

Although not discussing EfS specifically, this integrated approach to deliver curriculum using indoor-outdoor teaching aligns with the findings that “sandwiching” outdoor learning activities between indoor learning experiences enhances EfS learner outcomes (Ballantyne, et al., 2010). It clearly demonstrates the constructivist, holistic approach to learning described by many educators in this research.

The literature reports that curriculum materials support the use of outdoor teaching (Dirks & Orvis, 2005), however this was not the case in this study. None of the participants mentioned
Table 7 Categorisation of "Levels of Use" of Outdoor Teaching

<table>
<thead>
<tr>
<th>Typology of Utilisation</th>
<th>Teaching Outdoors Participant</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drop-out</td>
<td>●</td>
<td>Teacher who does not continue to use the strategies after the first attempt</td>
</tr>
<tr>
<td>Struggler</td>
<td>● Russell*</td>
<td>Teacher continues to use the innovation but at a very mechanical level, making few changes and with a low level of understanding</td>
</tr>
<tr>
<td>Domesticator</td>
<td>●</td>
<td>Teacher who has taught successful lessons using the materials but has adapted the strategies to their normal teaching approach</td>
</tr>
<tr>
<td>Succeeder</td>
<td>● Anna, Megan</td>
<td>Teacher has successfully used the approach with understanding but not enough to be independent of the curriculum materials</td>
</tr>
<tr>
<td>Innovator</td>
<td>● Andrea, Andrew, Bronwyn, Carolyn, Diana, Fiona, Geoff, Helen, Jane, Kate, Katrina, Suzanne</td>
<td>Teacher who understands the approach and is able to vary and generalise it to their other teaching</td>
</tr>
</tbody>
</table>

*Russell completed few survey and interview questions, however his responses indicated regular use of the kitchen garden as a site and enabler for outdoor learning.

the comprehensive curriculum materials or professional development sessions conducted by the kitchen garden organisation, although these were on going. It appears that after three years, Apple educators’ confidence with teaching outdoors has increased to the point where most may be classed as Innovators who regularly include effective EfS strategies outdoors to support curriculum delivery, the school’s holistic educational philosophy and learner outcomes.
5.2.3 INTERDISCIPLINARY LEARNING OUTDOORS

Interdisciplinary learning is the norm at this school, with educators planning cross-curriculum links when preparing their units of work. Table 6 summarises several interdisciplinary units given as examples of outdoor teaching during this research. Kitchen lessons are also interdisciplinary, including maths, science, health and sustainability knowledge and skills as children learn to cook using produce grown and harvested from the garden. As mentioned earlier, every kitchen lesson involves outdoor learning activities, with groups identifying and harvesting the vegetables and herbs needed for the week’s recipe, and collecting meal scraps for the garden worm farm and compost. This authentically reinforces WSS, as children observe and participate in the full production cycle of the kitchen garden, from scraps to food.

The Class Garden unit (see Table 6) is an example of the integrating context of school gardens referred to in the literature (Graham, et al., 2005). Class gardens may be considered learnscape when they include environmental objectives and incorporate children’s on-going involvement in their maintenance and improvement (Skamp, 2009b). Although the project started as a maths task, the permaculture principles central to the garden’s management clearly support its use as a learnscape. The use of the school environment as an integrating context (EIC) for the curriculum allows children to conduct real life investigations and learn cooperatively, while enhancing EfS understandings, including sustainability concepts such as interdependence, future generations, diversity, uncertainty and precaution (Cutter-Mackenzie, 2009; Malone & Tranter, 2003b). Educators report that students are more motivated to extend their learning within the classroom when they are engaged with real life contexts:

_They are getting so excited about writing [letters to themselves to put in the time capsule] they are so quiet working on it_ (Fiona, Interview, p.5).

The increased student motivation and enjoyment from learning outdoors, in turn, encourages educators to use outdoor teaching activities more frequently.

5.2.4 CONCLUSION

Educators at Apple State School use the outdoor environment as an integrating context for learning and plan meaningful indoor and outdoor activities. They use real, topic-based tasks to bring learning to life and engage students in interdisciplinary learning. The hands-on activities cater for all learners through Experience-based Learning and cooperative learning with peers. Section 5.3 will examine why educators regularly teach outdoors at this school.
5.3 WHY DO EDUCATORS REGULARLY TEACH OUTDOORS AT APPLE STATE SCHOOL?

Section 5.2 has outlined how Apple State School educators integrate outdoor activities into their daily teaching practice. Section 5.3 will examine why Apple educators go outside so regularly. Section 5.3.1 will examine the reasons educators teach outdoors: the green school grounds, kitchen garden programme and school culture. Section 5.3.2 will discuss the reported benefits for learners from outdoor learning and compare this to the literature. Section 5.3.3 will examine behaviour management outdoors at Apple State School. Section 5.4 examines how outdoor teaching supports sustainability education at this school.

5.3.1 WHY GO OUTSIDE?
Educators at Apple State School go outside to teach regularly, supported by their school culture, green school grounds and kitchen garden project; teaching outdoors is seen as good pedagogy. Outdoor learning positively engages and motivates their students; clarifies abstract concepts; leads to deeper understandings about interconnections; and makes learning real life. It is also clearly pleasurable for both students and educators to teach and learn outdoors:

_Sitting out there and doing the experiments, look at our environment we are so lucky_ (Carolyn, Interview, 1).

Such responses concur with the many studies of students and teachers that have reported a preference for teaching and learning outdoors (Blatt & Patrick, 2014; Fägerstam, 2014; Nagel, 2004; Norddahl & Einarsduttir, 2014).

The school setting, described in Chapter 4, appears to be the biggest enabler to outdoor teaching at this school, with the majority of educators reporting that the school grounds and kitchen garden were the reasons for teaching outdoors. The kitchen garden programme ensures that the garden is sustainable and maintained, rather than relying on teaching staff to have the knowledge, skills and time to coordinate volunteers and resources:

_The garden/kitchen have a manager so its well organised/maintained_ (Jane, Survey, 1).

_Administration support for staffing, great environment, timetable for kitchen garden and staff_ (Andrew, Survey, 1).

The programme increases outdoor teaching activities even for students who do not attend scheduled classes:
Our [Year] 4’s go across to the vege patch every fortnight and often when they are across at the kitchen garden, we do gardening with the [Year] 2’s and 3’s ... outside the classroom as well (Carolyn, Interview, 1).

The kitchen garden project takes teachers outside regularly and prompts further outdoor learning. Fiona mentioned taking the whole class back to the kitchen garden so that Year 4 students could teach younger children what they had learnt about insects during garden classes. Educators also incorporate students’ gardening experiences with cross-curriculum classroom tasks, such as in the unit My Dream Backyard (see Table 6). Using the environment as an integrating context (EIC) is engaging and motivating for learners and therefore educators. The kitchen garden programme is a significant enabler for outdoor teaching and learning opportunities; through their gardening involvement, educators have gained confidence and experience with teaching outdoors and using EIC.

The Principal’s support is essential for the resourcing of the green school grounds and the kitchen garden programme. Some educators, such as Jane, emphasised the importance of the Principal’s role in supporting the kitchen garden. However, despite using a wide range of outdoor spaces, most educators failed to acknowledge the important role of school leadership in developing and maintaining the green school grounds, including the vegetable garden. Only one participant mentioned the significant resourcing of the school grounds and the wider impact of the kitchen garden philosophy on the school’s culture:

*Everything in our facilities supports the outdoors, from the amount of money that is put aside in relation to things like [grounds] maintenance and development, like the ... kitchen garden programme, but its more than that, it’s more the whole impact of permaculture* (Andrea, Interview, 2).

The school grounds have been well established for decades, however new learnscape features are constantly developed and participants failed to mention this. The resourcing of the school grounds directly supports outdoor teaching through the maintenance and improvement of outdoor sites for learning.

Interestingly, one educator explicitly denied the Principal was an enabler for outdoor teaching beyond facilitating the kitchen garden programme, instead stressing the importance of the teaching culture:

*the school grounds are kept so vibrant with vegetation and because it’s there you want to and the kids want to [go out, but] it’s not mandated to go outside … It’s*
encouraged from on top, obviously the kitchen garden project is from on top and you can see why those classes who have [Year] 2’s and 3’s [make gardens] when the 4’s go out every week. But it [teaching outdoors] is part of the culture of the school, it is not written down anywhere, it is just what we do (Suzanne, Interview, 4).

This echoes Carolyn’s responses that the green school grounds are attractive but the school culture is the most significant factor in Apple educators regularly taking learning outdoors.

Educators are certainly satisfied with the grounds, with only Jane and Katrina noting additional facilities or resources to support outdoor teaching:

*Adventure playgrounds. Sensory trail* (Jane, Survey, 2).

*It would be great to have a supply of mats for children to sit on* (Katrina, Survey, 1).

The green school grounds and kitchen garden programme clearly underlie outdoor teaching in this case, however without the supportive social culture, educators would probably be less likely to use the school grounds. Section 5.3.2 will discuss the perceived benefits for learners that encourage Apple educators to teach outdoors regularly.

### 5.3.2 Benefits from Learning Outdoors

Apple educators all agreed that learning outdoors contributes positively to learner outcomes (Chawla & Flanders Cushing, 2007; Lieberman & Hoody, 1998). They often referenced real life learning, engagement and motivation as benefits of teaching outdoors:

*Develop understanding of how what is being learnt links to the real world. Hooks student interest* (Fiona, Survey, 1).

*Engages children, helps to stimulate/settle them get them ready to learn* (Diana, Survey, 1).

*Basically they don’t realise its schoolwork when they’re outside* (Anna, Interview, 5).

In agreement with Block et al. (2012), this is especially true for at-risk and diverse learners:

*Some of them come with a negative idea of school. If you can get them outside of the four walls, they enjoy themselves more, which means we can do more teaching and learning and get more out of it* (Anna, Interview, 2).

Educators believe outdoor learning also supports educational outcomes by applying abstract concepts in practical and memorable ways:
Model/demonstrate the theory, puts it into practise and engages students with the environment ... makes learning clear, students remember these experiences and the learning that went with it (Suzanne, Survey, 1-2).

Providing stimulating and cross-syllabus opportunities for learning... Formulates a deeper understanding and scaffolds knowledge (Bronwyn, Survey, 1-2).

Just one comment was made regarding student ownership, often referred to in the literature as empowerment, which supports both academic outcomes and future sustainable behaviour (Skamp, 2009b).

The children are open to learning in an outdoor environment as they take possession of their garden (Helen, Survey, 1)

Educators’ responses align with the literature findings on the benefits of outdoor learning in Section 1.2 and a constructivist approach to teaching.

Apple educators reported that teaching and learning outdoors influences students’ environmental attitudes, beliefs and behaviours:

Growing seedlings from seed in homemade potting mix (using compost product). Taking care of plants and growing food enhances understandings of food miles, health and seasonal foods (Andrew, Interview, 1).

Respect for environment when students see and experience the need to protect and conserve (Katrina, Survey, 1).

“Walk the talk”: children actually experience the impact their behaviour has on their environment (Jane, Survey, 1).

Fiona and Andrea both mentioned children teaching peers about respecting trees and fruit:

When new children come to our school and all our trees are bearing fruit and they are picking plums off and throwing them, our kids come in and say “No, you don’t do that in our school. That’s there and we are caring for our environment” (Andrea, Interview, 2).

Although Apple students and families have tended to be from rural and environmentally friendly backgrounds (see Section 4.4), educators remarked upon the influence children have on the sustainability of their family through class cooking lessons and litter reduction:

You hear a lot “ we never used to have this kind of food but now we are” or a Mum said to me the other day “now I have to make my own pasta and buy a pasta
machine”. So we are seeing the filter out, what was naturally a culture, as the clientele has changed over the years, ... the healthy lifestyle is now because of the overt teaching and learning (Bronwyn, Interview, 4).

That attitude and philosophy that you don’t bring litter to school. It gets rather contentious with the parents but that's the first thing (Andrea, Interview, 3).

These are examples of the wider impact of school gardening on sustainability that Ozer (2007) described (see Figure 2). The impact of teaching outdoors on school sustainability will be further discussed in Section 5.4.

5.3.3 BEHAVIOUR MANAGEMENT OUTDOORS

Behaviour management concerns are often reported in the literature as a barrier to taking learning outdoors. Only Megan and Anna mentioned poor behaviour as an issue:

*Behaviour issues can inhibit* (Megan, Survey, 1).

*It can be difficult to manage a group ... some children have difficulty with self-management outdoors* (Anna, Survey, 1).

Anna was clearly less comfortable than other educators when teaching outdoors, including “Procedures” as a teaching strategy:

*If children understand procedures then lesson should be more successful* (Anna, Survey, 2).

*It’s a case of training them... Reminding them that you like coming out here then you have to behave. But we also set boundaries ... as to where you can go. So it’s basically setting up the situation first, so that they’re clear where they can go what’s expected of them. And that is done before; you don’t just send them off. Explain the rules and guidelines first* (Anna, Interview, 2).

Further examination of the interview data revealed that despite these concerns regarding student behaviour, Anna recognised the benefits of teaching outdoors and incorporated it into her regular practice. This led to her classification as a Succeeder, rather than an Innovator (see Table 7). Interestingly, when questioned during the interview regarding student difficulties outdoors, no educators recalled any students whose behaviour worsened outdoors. Suzanne reported that student behaviour was the same, inside and out:
There are some kids who will play up in here or outside, it is just being mindful of that but it doesn’t put me off taking them outside. It is something they are really interested in and eager to do, so usually they are pretty good if they want to do the activities and see what is going on. There are not really behaviour management problems but there is silly behaviour at times (Suzanne, Interview, 2).

She also mentioned that since learners prefer being outdoors, it is easy to curb poor behaviour, and Fiona agreed that she rarely even needed to warn her students:

They make that choice for themselves, they love it [outside] so they are always well behaved and if we threaten to take their carrot away ... you never find you have to (Fiona, Interview, 8).

The improvement in student behaviour when learning outdoors at Apple, concurs with Lieberman and Hoody’s (1998) findings that EIC classes report less misbehaviour than traditionally taught classes.

As mentioned in Section 4.4, Apple State School children are used to going outdoors, enjoy it and know how to behave. All educators responded that poor behaviour was not a concern at this school:

Not really, if you had major behaviour issues it might be more difficult, but our kids just love it (Fiona, Interview, 4).

I think it’s been such a routine and ...[outdoor learning is] so common that I don’t think management issues are a big part...It’s an extension of your room; it’s not a special trip (Carolyn, Interview, 3-5).

Like Anna, other educators stressed the importance of making behaviour management expectations clear before going outdoors and reminding students of these expectations:

I’m happy to sit them down and give them a little reminder if we need to do ... if you don’t do it then you are doing them an injustice and they go outside and they go crazy. Whereas, if you start at the beginning and it’s just something that you do... (Carolyn, Interview, 3).

Several educators mentioned that positive classroom behaviour was more likely to result from outdoor teaching, because teaching outdoors was motivating and engaging for diverse learners:
The kids who sort of muck up in here are more engaged out there as they tend to like the hands-on stuff more than sitting still... they’re not needing to write everything down, they’ve had the same experience, so they are just as much an expert as anyone so all of them feel free to share and express what they have learnt (Suzanne, Interview, 3).

Different behavioural/social skills needed at times. Different children perform differently in variety of contexts/environments (Jane, Survey, 1).

Engaging diverse learners was a common reason for teaching outdoors regularly, and behaviour issues were clearly reduced by the use of outdoor learning activities.

5.3.4 CONCLUSION

Apple State School educators teach outdoors because they believe it is good pedagogy and good for learners. Learners are motivated by being outdoors and enjoy it, real life learning supports understandings of abstract concepts, and it engages diverse learners and supports EfS delivery. Educators are motivated by the educational and behavioural rewards of outdoor teaching and find these clearly outweigh any challenges from leaving the classroom.

5.4 OUTDOOR TEACHING FOR SUSTAINABILITY

Although educators in the study rarely mentioned WSS, it is an unacknowledged underlying factor supporting outdoor teaching at the school. Apple’s holistic educational philosophy, green school grounds, and school culture of EIC using experience-based learning pedagogies support cross-curriculum EfS implementation. Interdisciplinary units and indoor/outdoor curriculum integration support environmental understandings and foster empathy with nature (Chawla & Flanders Cushing, 2007; Gill, 2011). Apple educators believe that teaching outdoors supports EfS outcomes (see Section 5.3.2), and the regular outdoor learning allows children to engage formally and informally with nature.

5.4.1 SUSTAINABILITY ACTIONS

Educators usually referred to sustainability actions when questioned regarding sustainability education. Lunch waste management was often reported, with student monitors coordinating the project:

We put kids as part of our leadership role, [Year] 5, 6, 7, upcoming leaders get to be on the recycling team... Ten [students] are responsible for getting around and making
sure that its being looked after properly...they put together a slide presentation and go to each class and present that (Geoff, Interview, 4).

This type of student-led project demonstrates use of the Sustainability Action Process (SAP) (Australian Government, 2010), and the student-led participation in ongoing sustainable behaviours indicate that the compost station could be considered a learnscape (Skamp & Bergmann, 2001). The SAP was also evident in the Soil Erosion unit (see Section 5.4.2), although no educators made the link to EfS. Long-term access to real project sites around the school contributes substantially to WSS and models the effective EfS practice outlined in the SCF (see Figure 1).

There was just one mention of the whole-school approach to sustainability and that Apple is a sustainable school. Several educators mentioned other school sustainability action taking, such as saving water and electricity within the classroom:

*Doing things like turning off computers when we’re finished to save electricity, all those sorts of things become a natural part of their belief structure* (Andrea, Interview, 2).

*We are on bore water and its really interesting because of our clientele, a lot of them, come from properties anyway and are very aware of tank water and not wasting water and things like that* (Carolyn, Interview, 3).

Sustainability appears to implicitly underlie the school culture. Although many aspects of WSS and effective EfS are apparent upon analysis of this case, the implementation of an explicit school environmental management plan was not evident.

### 5.4.2 SUSTAINABILITY IN THE CURRICULUM

Sustainability was apparent in many examples of units given to illustrate outdoor teaching activities (see Table 6). Analysis revealed that outdoor learning tasks were often integrated with futures thinking and planning action for sustainability, such as the Light and Shadows unit being extended to research the pros and cons of a renewable energy resource (see Table 6). The Soil Erosion unit incorporated the pedagogies of effective EfS by applying the SCF (see Figure 1) including direct learning, student-led participation, interdisciplinary and multidimensional learning (futures thinking), as well as emotional learning (Eilam & Trop, 2010) as students tried to reduce erosion in the school grounds. However, only Andrea referred to the cross-curriculum priority of sustainability:
The whole thing that supports it [outdoor learning], there are so many areas, but one of them is probably the sustainability aspect of curriculum and ... learning about the environment and the sustainability of the environmental aspect of our world and how can we use the outdoor space to do that (Andrea, Interview, 1).

Educators believe the kitchen garden programme supports environmental learning outcomes, but participants rarely mentioned sustainability without prompting and appeared unaware that Apple’s educational philosophy and culture demonstrates many of the principles of EfS. This silence regarding sustainability was particularly evident regarding the community’s involvement in the school.

5.4.3 COMMUNITY SUPPORT

Several educators mentioned the importance of the wider community with the kitchen garden. The kitchen garden has been a part of building community partnerships and relationships for over ten years. One of the original volunteers recently returned to work with gardening classes and supported an educator to build a classroom garden:

We had experts come in and show us how to incorporate that [compost] with our own class garden and we made that part of science and literacy as well, because we did it on procedural genre ... so we had that community involvement as well, which was brilliant (Carolyn, Interview, 1).

Ongoing parent community help for school ground projects ensures their continued success and sustainability, and is also a key principle of lifelong EfS. The community contribution to the improvement of the grounds is essential to their ongoing maintenance and directly supports regular outdoor teaching and sustaining the kitchen garden project. Apple’s philosophy of real life learning partners children with community members to develop new learnscapes, such as the banana key-hole gardens that were re-done during data collection for this research.

Community engagement provides educators with expert advice, resources and labour, and enables educators to focus on integrating outdoor learning activities with the class curriculum. In one example, a parent supported an educator to plan and build a class garden:

She donated so much time to me and she gave me the books and planned with me how it was going to happen, so it wasn’t just interdisciplinary it was community as well, which was really exciting (Carolyn, Interview, 1).
This expert involvement broadens the learning community, reducing the load on educators while developing their outdoor teaching expertise and experience. Educators value community volunteers, who directly teach students and act as mentors in the kitchen garden project. Local government and businesses also provide resources and materials for garden and sustainability projects, and farms donate produce for sale at the annual fundraising fair. The principles of EfS are clearly supported through this local community networking, again demonstrating the influence of the kitchen garden project on the wider Apple community (see Figure 2).

5.4.4 CONCLUSION

The neighbouring rural landscape, including farms, a forest, watercourse and pastures, allows educators easy access to a variety of environments for outdoor teaching and projects. Learnscape sites are evident within and beyond the school grounds, supporting EfS through ongoing engagement with nature and action for sustainability. Although not always explicit, WSS and EfS principles underlie Apple State School’s holistic educational philosophy and support the regular use of outdoor teaching. The extensive community network further supports educators to use the environment as an integrating context through resource provision and extension of the learning community.
6. Conclusions and implications

This study investigated how educators use outdoor teaching to deliver curriculum in a Queensland primary school. The interpretive inquiry sought to understand what outdoor teaching occurs in this case, how it is planned, and why it is selected as a strategy. Educators at Apple State School have experienced the educational possibilities of outdoor learning through several years of involvement in the kitchen garden programme and the majority of educators now incorporate outdoor teaching into their daily practice. The conclusions of the research inquiry will be explained in Section 6.1. Section 6.2 will present the subsequent recommendations for stakeholders.

6.1 CONCLUSIONS

The conclusions regarding this research are framed by answering the research questions. Section 6.1.1 summarises the conclusions regarding the overarching research question: how outdoor teaching is used at Apple State School. Section 6.1.2 describes how and why educators plan outdoor teaching, and Section 6.1.3 concludes whether outdoor teaching supports the delivery of cross-curriculum EfS. Given the regular use of outdoor teaching at Apple, Section 6.1.4 identifies the factors that support educators at this school to regularly take learning outdoors.

6.1.1 HOW IS OUTDOOR TEACHING USED AT APPLE STATE SCHOOL?

Apple educators teach outdoors on an almost daily basis, far beyond the weekly kitchen garden lessons that were identified at the commencement of the study. Science, maths, literacy and gardening were regularly taught outdoors by most classroom educators. Educators’ conceptions of teaching outdoors encompass a range of pedagogical intentions.

Educators used a range of areas for outdoor teaching, including both natural and human-made areas within and adjoining the school grounds. A variety of teacher delivery modes were used, depending on the lesson objectives. Outdoor activities used experience-based learning strategies to support learners to apply abstract classroom concepts and bring the curriculum to life. Teacher-directed learning was rarely used outdoors by classroom educators and outdoor learning activities were closely linked to indoor tasks. Educators consolidate and reflect upon concepts and understandings from outdoor investigations after returning indoors. The close integration of indoor-outdoor practice aligns with effective
fieldwork and EfS teaching practices and demonstrates the adoption of the strategy as a normal practice within this school.

The school grounds and learnscapes offer opportunities for hands-on application of abstract classroom concepts, real life learning opportunities and nature engagement. Real life learning is a core philosophy of the school and the kitchen garden programme supports this learning for life, as students engage in outdoor activities that are underpinned by sustainability practices, such as composting and gardening. Educators plan tasks that include the principles of EfS, using the school grounds or student’s home as a local setting for inquiry-based or future scenarios.

6.1.2 HOW AND WHY DO EDUCATORS PLAN OUTDOOR LEARNING?

Educators recognise the inherent motivation of authentic tasks, and that learner engagement is grounded in activities conducted in the students’ local environmental context (EIC). The green school grounds at Apple State School are the preferred learning and teaching environment for students and educators. Educators believe that students are more engaged, motivated and happy when learning outdoors. Engaging all learners is a major reason why many educators take classes outside, and they consider it their responsibility to increase children’s outdoor learning opportunities and nature experience. Diverse learners benefit from learning outdoors, especially those who struggle indoors with teacher-led passive learning. Challenging students seem more engaged in outdoor learning tasks, making outdoor teaching an important strategy to address classroom diversity. Behaviour management is not a barrier to teaching outdoors at this school, with educators providing clear expectations of student behaviour before going outside. Educators believe that regular time outdoors, formally and informally engaging with the natural environment, supports the development of future environmental attitudes and cross-curricular understandings.

The diverse, green environment of Apple State School’s grounds offers a great incentive for educators to take their class outdoors and enjoy the attractive natural environment and alternative learning spaces. The school grounds have been developed over many years and are constantly improved by the whole school community. Students use the school grounds as learnscapes, planning and implementing action for real issues such as erosion, and evaluating their success or failure. Resource provision for the maintenance and development of the grounds demonstrates the priority the school administration places on enhancing the outdoor environment for learning.
6.1.3 DOES OUTDOOR TEACHING SUPPORT THE DELIVERY OF EFS?

The process of outdoor teaching in at Apple State School aligns with the literature on effective fieldwork teaching and the principles of EfS. Educators use similar teaching modes to fieldwork educators and employ Experience-based Learning to engage students in activities that bring the curriculum to life pedagogies (Ballantyne & Packer, 2009). Indoor and outdoor learning activities are closely integrated and planned, with direct instruction complementing outdoor student-led inquiry-based learning. The pedagogy of responsible uncertainty is evident, with educators often extending activities to include interdisciplinary learning beyond the original lesson plan (Somerville & Green, 2011). Student interest in outdoor learning activities provides motivation for many learning areas including literacy and maths, thus teaching outdoors supports broad cross-curriculum learning (Skamp, 2001).

Outdoor learning activities support students’ environmental knowledge, skills and attitudes, and Apple educators feel it is the school’s responsibility to ensure children have regular outdoor experiences. Students who initially find it challenging to be outdoors benefit from regularly outdoor experiences. The ongoing engagement with learnscapes in the school allows students to observe changes over time, fostering multi-dimensional and emotional learning about the natural environment and supporting future environmental action-taking (Chawla & Flanders Cushing, 2007; Eilam & Trop, 2010; Rickinson, 2001). Educators are supported to use the environment as an integrating context (EIC) in interdisciplinary units through the school’s overall environmental focus and holistic educational philosophy of learning for life. EIC enhances academic, social and environmental learning outcomes through experience-based learning in the students’ own backyard (Lieberman & Hoody, 1998; K. T. Stevenson, et al., 2014).

6.1.4 WHAT SUPPORTS EDUCATORS TO TEACH OUTDOORS?

The green school grounds, school culture and Principal’s support are central to the regular outdoor teaching practice at Apple State School, but the most influential causal factor appears to have been the kitchen garden project. Although the school vegetable garden was sustainable for over 10 years as a community garden club, the timetabled kitchen garden lessons were the catalyst for educators taking classes outside to learn on a daily basis. The kitchen garden organisation’s presentation materials convinced the Principal of the value and importance of the project in enhancing learning for all students.

Educators rarely ventured into the school garden before the kitchen garden project began. Now, probably due to several years of attending fortnightly garden classes, Apple
educators throughout the school have adopted outdoor teaching as a regular strategy. The specialist teacher aides and other volunteers who deliver the kitchen garden project have extended the school’s learning community, allowing classroom educators to focus on integrating indoor and outdoor learning opportunities across curricula without the pressure of managing the project. The impact of learning in the school garden has clearly extended beyond students’ and teachers’ personal experiences to affect their classrooms, homes and broader community and achieved several objectives of EfS (see Figure 2).

The green school grounds and kitchen garden project combined with the school’s educational philosophy and teaching practice, have allowed educators to embrace “being green”. The physical and social structures of the setting have clearly affected the practices that occur in this case. Regular outdoor teaching by almost all participants is a considerable achievement, given that educators in other settings find it difficult to justify taking learning outside. The consensus of this research on learner engagement, motivation and improved behaviour provides considerable evidence that outdoor experience-based teaching using the environment as an integrating context supports cross-curriculum learning.

6.2 IMPLICATIONS AND RECOMMENDATIONS

The unique aspects of this school’s physical and social setting have been highlighted in Chapter 4. Whether the outdoor teaching practices adopted by these educators are adaptable to other school settings is unknown, and the limitations to generalisability from a single case study design have been acknowledged in Section 3.6. However, as an example of best practice, this research has provided significant detail about the practical process of teaching outdoors in school grounds and educators’ beliefs regarding the strategy. The research conclusions have implications for the implementation of cross-curriculum sustainability in Australian schools. These will be discussed in Section 6.2.1, and recommendations from the research findings will be made in Section 6.2.2.

6.2.1. IMPLICATIONS FOR EFS PRACTICE

There seems to be considerable potential for outdoor teaching to engage learners across the curriculum and deliver successful EfS. Apple State School’s kitchen garden project has had positive effects on outdoor teaching frequency and the delivery of EfS, confirming Moore’s (1995) assertion that a school garden is a most effective way to support EfS delivery. Although clearly supportive, the beautiful green school grounds and community vegetable
garden were not sufficient to encourage educators to teach outdoors regularly; the kitchen garden project was the primary driver for educators’ integration of outdoor teaching practice.

The pro-active Principal and collaborative staff culture supported the kitchen garden project to become the catalyst for Apple State School’s regular outdoor teaching. The four aspects of effective EfS pedagogy (Eilam & Trop, 2010), Sustainability Action Process (Australian Government, 2010) and Ballantyne and Packer’s (2009) experience-based learning strategies are all evident in the school’s adoption of regular outdoor teaching practice:

(a) Indoor-outdoor integration: including teacher-led and experience-based learning activities to support learning across the curriculum.

(b) EIC: using the Environment as an Integrating Context with interdisciplinary learning through learnscapes, local government and community networks.

(c) Multi-dimensional learning: allowing comparisons over time and place by using the Sustainable Action Process (see Figure 1).

(d) Emotional learning, through fostering on-going reflection and informal contact with nature.

These four aspects summarise the EfS pedagogical theory that outdoor teaching has demonstrated in this case study. Promotion of integrated outdoor teaching in schools is imperative, both to support the goals of EfS and because of the potential impact on student learning through effective content and process delivery and increased learner engagement. The onus now falls on the stakeholders to support the use of outdoor teaching in schools. Stakeholders include: government, professional teacher associations, curriculum developers, teacher education institutions, community environmental groups and businesses, school principals and educators themselves.

6.2.2 RECOMMENDATIONS FROM THE RESEARCH

This research supports the use of outdoor teaching as a strategy that aligns with EfS theory and supports the delivery of cross-curriculum learning in a primary school. Application of this research methodology to other primary and secondary school settings would provide further information on the process of outdoor teaching in schools. It is clear from this case study that integrated outdoor teaching is an important strategy to enhance curriculum delivery in a
motivating and enjoyable way for both learners and educators. The following recommendations support educators’ adoption of regular outdoor teaching:

- Australian Government: the *Review of the Australian Curriculum: Final Report* (Australian Government, 2014) concludes in Recommendation 17 that the cross-curriculum priorities need to be reconceptualised, with sustainability embedded explicitly in the mandatory content of the curriculum where educationally relevant. This recommendation should not be accepted, given the interdisciplinary nature of sustainability and multiple benefits for learners from EIC. Instead, financial resources need to be allocated for state education departments and other professional bodies to develop and distribute professional development materials that support the practical implementation of sustainability as a cross-curriculum priority.

- Curriculum Developers: ACARA needs to continue the process of tagging curriculum content to the Overarching Ideas of sustainability, and producing teacher professional development resources for EfS planning and teaching strategies.

- State Government Education Departments and other school organisations: need to provide resources for professional development that supports educators’ understandings of EfS and develops ongoing communities of sustainability practice that promote experience-based teaching and EIC in schools.

- Australian Institute of Teacher Standards: should include reference to sustainability within the professional teaching standards and promote EfS teaching practices.

- Australian Association of Environmental Education (AAEE): should ensure the educational grounds for EfS are promoted to government and the wider community. AAEE should develop and promote regional resources for educators to access local environmental educators, community groups and businesses.

- Tertiary Education Institutions: must provide pre-service teachers with opportunities for outdoor learning experiences, local community networking activities and professional development in EfS content and strategies. Opportunities are required for pre-service teachers to explore links to cross-curricular themes in curriculum courses and identify how teaching outdoors supports student engagement and learning.
• Environmental community groups and businesses: should promote of the positive learning outcomes of real sustainability action, within and beyond school grounds, and provision of human and material resources for school learnscape projects.

• Principals: can provide legitimacy for teaching outdoors through facilitating open discussion and negotiation with the school community, and delivering resources to promote EfS: vegetable gardens, greening/learnscaping school grounds, encourage staff links to local government and environmental community groups, professional development, timetabling and staffing.

• Educators: should participate in local environmental events and invite parents and local community environmental experts to broaden the school’s learning community through involvement in school environmental and sustainability events and projects.

Application of this research methodology to other primary and secondary school settings would provide further information on the process of outdoor teaching in schools. Further investigation of school students’ perspective on learning outdoors in school grounds and learning outcomes and benefits is also recommended.


Gough, A. (2012). The emergence of environmental education research: A "history" of the field. In R. Stevenson, A. E. J. Wals, J. Dillon & M. Brody (Eds.),
International handbook of research on environmental education (pp. 13-22): Routledge.


Appendices

Appendix A

EfS in Outdoor Education and Fieldwork

Commonly shortened to Outdoor Education, outdoor adventure education usually involves undertaking personal and group challenges in natural areas. It is primarily designed to foster personal and social growth, often in locations remote to the students’ own community. There is an assumption that outdoor nature experiences, such as hiking, will have an effect on students’ environmental learning, however there is little research evidence that this occurs and the characteristics of most outdoor education programmes make this quite unlikely (Polley & Pickett, 2003).

In Australia, these adventure-based challenges are often conducted with little reference to either the school curriculum or environmental sustainability. Achieving the potential of outdoor adventure education to support EfS requires the explicit integration of sustainability and curriculum, and this has been proposed as a way to support authentic EfS delivery in schools (Gough, 2007). Hill (2012) conducted a case study of six New Zealand outdoor educators’ incorporation of sustainability into their outdoor education programmes. The research findings provide a framework for educators to adopt EfS practices and themes in their programmes through addressing three aspects of sustainability education. The EfS change-model included three aspects of change: “first, in philosophy, values and understandings, second, in infrastructure, resources use and programming, and third, in teaching and learning strategies” (Hill, 2012, p. 15). Hill’s (2012) research clarifies the need for pedagogical change to be supported by effective professional development, developing an on-going professional community of practice, and aligning the three stages of the model with the principles of EfS. This framework could be adapted to support schools’ inclusion of EfS, as without professional development and an on-going community of practice educational change is unlikely to occur. The explicit adoption of EfS within outdoor education programmes would maximise learning for sustainability beyond the basic provision of a nature experience. Shorter duration field trips or day excursions also offer significant potential for integration with curriculum, and the field trip literature will be examined next.
Research into the effectiveness of field trips to local natural areas or environmental education centres for environmental learning has been widely conducted (Humberstone & Stan, 2011). Field trips provide the possibility to explore, discuss and link theory to practice, and offer sensory stimulation through participation in real-life experiences in nature. Excursion-based activities have been shown to support the development of pro-environmental beliefs and action taking for the environment (Ballantyne, et al., 2010; Golob, 2011; Palmberg & Kuru, 2000; Sandell & Ohman, 2010).

The field trip literature has emphasised learner outcomes rather than examining the unique educational practices field trips may offer students. Comparative studies that evaluate ecology knowledge test results between groups who remained in the classroom and groups taught using field trips, consistently report higher test results for the groups who experienced fieldwork (Fägerstam, 2014). These studies unfortunately fail to provide information regarding the teaching strategies and pedagogies used on field trips to deliver academic benefits, however consensus exists that field trips enhance student learning. Field trips provide classroom educators with the opportunity to incorporate effective EfS strategies and potentially enhance their professional knowledge of best-practice outdoor teaching through observing and networking with environmental education professionals.

Despite the evidence that good fieldwork is effective for EfS and curriculum delivery, it occurs infrequently in schools (Rickinson, et al., 2004). Field trips require transport resources; increased staffing for the group and often lesson cover for educators who leave the campus. The amount of off-site fieldwork is increasingly restricted due to safety, curriculum and resource constraints (Rickinson, et al., 2004). The Department for Education and Skills, in the United Kingdom (UK), published a Learning Outside the Classroom Manifesto (2006), however this has failed to encourage teachers to venture outdoors due to considerable concerns regarding the management of risk and liability.
Appendix B

Research Project Information Sheet

Teaching Outdoors in School Grounds (HREC:S/12/436)

Dear Educator,

This research study is part of my Masters of Education course at the University of the Sunshine Coast. The research focus is on teaching outdoors in school grounds, and how it is integrated with the curriculum. This school has been selected due to its physical environment, and the focus on outdoor teaching and learning activities evident on the school website. Teachers, teacher aides and the principal are included in the research.

You are invited to participate in a confidential 20-minute survey of all teaching staff. Surveys are coded to ensure confidentiality while allowing the researcher to locate participant’s data if clarification or withdrawal is required. You will be asked questions about your experience, the types of learning strategies used outdoors, how teaching outdoors contributes to student learning, and how outdoor lessons are integrated with the curriculum. The research findings will be shared in a future staff meeting to allow professional reflection on the findings.

Several educators will be invited to participate further by completing a 40-minute interview to further describe your experiences with teaching outdoors. These interviews will be combined into narratives of the various ways school ground teaching is conducted at the school.

The risk of the research is minimal and every care will be taken. If you do agree to take part, you have the right to withdraw consent at any time. You may elect to take part in certain parts of the study and withdraw from others without penalty or justification. You will have the chance to amend, clarify, or withdraw your responses or other recorded data from the study at any time.

Data, findings and conclusions from the study may be published in professional journals and presented at conferences. Names will not be disclosed and similar data combined to reduce the chance of identification. Copies of original data and recording equipment will be kept in a locked filing cabinet, and destroyed once digital transcripts are made. Digital material will be kept on a password protected computer.

Please direct any questions about the research to myself, Kylie Moses on my mobile 0411 238 753 or email kyulemos@usc.edu.au. Please complete the attached consent form if you agree to participate in the first stage of this research. The researcher and University of the Sunshine Coast thank you for your kind consideration.

Yours sincerely,

Kylie Yule Moses
BHMS(Ed) Postgrad. Dip Exr & Nutrition Science
Appendix C

Site Consent Form

Teaching Outdoors in School Grounds (HREC:S/12/436)

Research Team: Kylie Yule Moses
Faculty of Science, Health, Education and Engineering
University of the Sunshine Coast
Contact Phone 0411 238 753
Email kyulemos@usc.edu.au

Associate Professor Deborah Heck
Faculty of Science, Health, Education and Engineering
University of the Sunshine Coast
Contact Phone 5456 5113
Email dheck@usc.edu.au

By signing below, I confirm that I have read and understood the contents of the research project information sheet and in particular have noted that:

- I consent to the research being conducted at my school site
- I have had any questions answered to my satisfaction
- I understand the risks involved
- I understand there will be no direct benefit to the school from participation in the research
- I understand that participation in the research is voluntary
- I understand if I have any further questions that I can contact the research team
- I understand that the school is free to withdraw at any time, without comment or penalty
- I understand that if I have any complaints about the way this research project is being conducted I can raise the with the Principal Researcher or the Research Ethics Officer at the University of the Sunshine Coast on 5459 4574 or humanethics@usc.edu.au.
- I agree for my school to participate in the project Teaching Outdoors in School Grounds.

_______________________________________ __________________
Name / Signature       Date

______________________________________ ___________________
Researcher        Date
Appendix D

Outdoor Teaching Survey

1. (a) How long have you been an educator? ____________________________
   (b) How many years have you worked at this school? _____________________

2. Please circle how frequently you teach outdoors in the school grounds:
   Never / Rarely / Daily / ____ per week / weekly / monthly / ____ per term/ never
   (b) What are your main reasons for teaching or not teaching outdoors in the school grounds?_______________________________________________________

3. Please circle the curriculum areas you have taught outdoors:
   Art       Mathematics
   HPE       History
   Literacy  Languages Other Than English
   Science   Study of Society & Environment
   Other __________________________________________________________

4. How do outdoor learning experiences contribute to student learning outcomes? __________________________________________________________

5. How do outdoor learning experiences contribute to students’:
   Environmental attitudes? _________________________________________
   Environmental beliefs? ___________________________________________
   Environmental behaviours? __________________________________________

6. Please circle the delivery modes you have used while teaching outdoors:
   Field investigation       Presentation
   Interpreted Walk          Discussion or debate
   Drama or story            Games or play
   Creative/reflective responses Worksheets
   Physical activity         Other (please complete) ________________
7. Please circle any experience-based learning you use if teaching outdoors:

**Learning by doing:** students are actively involved in exploration & investigation

**Being in the environment:** students experience & appreciate the environment

**Real life learning:** activities are based on real places, issues and authentic tasks

**Sensory engagement:** students explore the environment using all five senses

**Local context:** students investigate issues and problems in “their own backyard”

**Other:** (please describe)____________________________________________

8. (a) What other teaching strategies do you use to support outdoor learning?

____________________________________________________________

(b) Why do you choose these strategies?

____________________________________________________________

9. Which areas in the school grounds have you used for outdoor learning?

____________________________________________________________

10. Do you build on outdoor student learning when you return to the classroom? Yes / No

How?____________________________________________________________

11. Are outdoor learning activities integrated across curriculums? Yes / No

How?____________________________________________________________

12. Will you use outdoor teaching activities in the future? Yes / No / Possibly

Why?____________________________________________________________

Any other comments

____________________________________________________________

Thank you for your participation.
Appendix E

Interview Sample Sheet

1. What supports / inhibits outdoor teaching in the school grounds at this school? _______________________________________________________

2. What types of outdoor learning experiences contribute to student learning outcomes? E.g. ___________________________________________________________

3. What kinds of outdoor learning experiences contribute to students’ Environmental attitudes? _____________________________________________
   Environmental beliefs? _____________________________________________
   Environmental behaviours? ____________________________________________

4. Please describe examples of how you use different delivery modes when teaching outdoors? ______________________________________________

5. Please describe outdoor activity examples or learning units where you use experience-based learning strategies:
   Learning by doing:
   Being in the environment:
   Real life learning:
   Sensory engagement:
   Local context:

6. Are there other areas or facilities that would support you with conducting outdoor learning activities? ________________________________

7. Please give an example of how you (could) build on outdoor learning when you return to the classroom? ________________________________

8. How do you plan for outdoor learning activities to be integrated across curriculums?______________________________________________

Any other comments______________________________________________

Thank you for your participation.
CONSENT TO PARTICIPATE IN RESEARCH - INTERVIEW

Teaching Outdoors in School Grounds (HREC:S/12/436)

Research Team: Kylie Yule Moses
Faculty of Science, Health, Education and Engineering
University of the Sunshine Coast
Contact Phone 0411 238 753
Email kyulemos@usc.edu.au

Associate Professor Deborah Heck
Faculty of Science, Health, Education and Engineering
University of the Sunshine Coast
Contact Phone 5456 5113
Email dheck@usc.edu.au

By signing below, I confirm that I have read and understood the contents of the research project information sheet and in particular have noted that:

- I understand that my further involvement in the research will include participation in a confidential interview. The original data will be destroyed once digital transcripts are made.
- I have had any questions answered to my satisfaction
- I understand the risks involved
- I understand there will be no direct benefit to me from my participation in the research
- I understand that I am free to withdraw at any time, without comment or penalty
- I have kept a Research Project Information Sheet
- I agree to participate in the interview part of the project Teaching Outdoors in School Grounds.
- I do / do not consent to audio recording during the research process for data collection.

____________________________________  __________________
Name / Signature       Date

_____________________________________  ___________________
Researcher        Date
Appendix G

Survey Data - Closed

<table>
<thead>
<tr>
<th>Participant</th>
<th>Art</th>
<th>HPE</th>
<th>Literacy</th>
<th>Science</th>
<th>Maths</th>
<th>History</th>
<th>LOTE</th>
<th>SOSE</th>
<th>Other - Gardening</th>
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Appendix H

Survey Data: Open

<table>
<thead>
<tr>
<th>What are your main reasons for teaching/outdoor learning in school grounds?</th>
<th>How do outdoor learning experiences contribute to student learning outcomes?</th>
<th>How outdoor learning experiences contribute to environmental attitudes?</th>
<th>How outdoor learning experiences contribute to environmental beliefs?</th>
<th>How do you build on outdoor student learning when you return to the classroom?</th>
<th>How are outdoor learning activities integrated across curriculums?</th>
<th>Why will you use/not use teaching outdoors in future?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weather, access</td>
<td>Teaching students outdoors often increases enjoyment and motivation. This contributes to better student learning outcomes.</td>
<td>Children become more aware of their environment, the more time they spend outside. This can lead to greater concern and care for the environment.</td>
<td>Through reflecting on the task undertaken outdoors. Often using Habits of Mind.</td>
<td>Through our Smart Moves PE program. Used across other Key Learning Areas as required.</td>
<td>Student enjoyment. Differentiation. Environment is an important tool/place for learning.</td>
<td></td>
</tr>
<tr>
<td>Smart Moves, PE, circle time, Art, science</td>
<td>Interest: Using natural materials. Understanding local area.</td>
<td>Real world understanding about recycling and its importance, how they can have an impact on their immediate area.</td>
<td>Responsibility is on us to preserve our natural resources.</td>
<td>Recycling so we are reusing natural resources more effectively, less waste, e.g. compost, litter free lunches.</td>
<td>Reflections and discussions, scientific diagrams, mapping.</td>
<td>Interesting for students and teachers, we have a beautiful and diverse environment for quiet reflective activities / art / science etc.</td>
</tr>
<tr>
<td>Help students become fit and healthy and develop motor skills</td>
<td>Helps model/demonstrate the theory, puts it into practise and engages students.</td>
<td>Develop a concern and start thinking about their actions and beliefs</td>
<td>Clears up misconceptions</td>
<td>Learn to take better care of the environment and think about their</td>
<td>Discussion, questioning, action plan etc.</td>
<td>We have examples in various Key Learning Areas.</td>
</tr>
</tbody>
</table>
## Appendix I

### Survey and Written Interview Transcript

<table>
<thead>
<tr>
<th>Question (denotes interview sheet)</th>
<th>Questionnaire survey</th>
<th>Interview sheet (self-completed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Please circle how frequently you teach outdoors in the school grounds:</td>
<td>Daily</td>
<td></td>
</tr>
<tr>
<td>2(b) What are the reasons for teaching or not teaching outdoors?</td>
<td>Help students become fit and healthy and develop motor skills</td>
<td></td>
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<tr>
<td>i1. What supports / inhibits outdoor teaching in the school grounds at this school?</td>
<td>Structures – garden, shaded areas, amphitheatre, lots of vegetables</td>
<td></td>
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<tr>
<td>3. Please circle the curriculum areas you have taught outdoors:</td>
<td>HPE, Science, Mathematics, History, SOSE, Garden</td>
<td>Calculating perimeter, measuring distances, mud map of school. Bush collage, rubbings Experiments, field studies, observations, hands on activities, erosion, plant and animal adaptations, Human impacts on water quality/pollution Kitchen Garden</td>
</tr>
<tr>
<td>4. How do outdoor learning experiences contribute to student learning outcomes?</td>
<td>Helps model/demonstrate the theory, puts it into practise and engages students with the environment.</td>
<td>Kitchen garden program to engage in healthy eating / attitudes, hands on science/maths activities</td>
</tr>
<tr>
<td>i2. What kinds of outdoor learning experiences contribute to student learning outcomes? E.g.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. How do outdoor learning experiences contribute to students’:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5(a) Environmental attitudes</td>
<td>Develop a concern and start thinking about their actions and beliefs</td>
<td>Science eg unit on erosion and student contribution to erosion at the school</td>
</tr>
<tr>
<td>5(b) Environmental beliefs</td>
<td>Clears up misconceptions</td>
<td>Interacting with the environment helps students feel safe in nature and then they are better able to appreciate the environment</td>
</tr>
<tr>
<td>5I Environmental behaviours</td>
<td>Learn to take better care of the environment and think about their actions</td>
<td>Making an action plan to reduce erosion. School/class composting bins and recycling bins.</td>
</tr>
</tbody>
</table>
Appendix J

Case Setting Mind Map

Apple State School (Site / Setting)

- Diverse learners
- Healing
- Students (Participation)

- sprawling philosophy (Condition)
- Principal (Participation)

- Kitchen Garden (Condition)

- Resources: - materials - labor

- "Green"
- Outdoor learning
- School culture (state)

- Healthy
- Volunteers
- Permaculture experts
- Understorey areas
- Planting areas
- Amphitheatre
- Oval

- Kitchen garden
- Splash pool

- Community (Participation)

- Rural farm owners
- Local business owners
- Indigenous elder

- Local government

- Supportive

- Multicultural

- Real life learning

- Parental involvement (Participation / Condition)

- Permaculture experts

- Rural farm owners

- Local business owners

- Indigenous elder

- Supportive

- Multicultural

- Real life learning

- Parental involvement (Participation / Condition)