

Outdoor Learning Spaces; *The use of outdoor learning spaces in  
shaping student learning experiences in Australian secondary schools*

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## **Declaration**

This dissertation contains no material that has been accepted for the award of any other degree or diploma in any educational institution and, to the best of my knowledge and belief, it contains no material previously published or written by another person, except where due reference is made in the text of the thesis.

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## **Abstract**

Insight into the current use of outdoor learning spaces to engage secondary school students and shape their learning experiences in Australian educational contexts is provided through a narrative literature methodology. The benefits of the use of outdoor learning spaces for teaching adolescent students are shared along with limitations and challenges. Connections between The Australian Curriculum, other curriculum documents and effective pedagogies and the use of outdoor learning spaces are outlined to highlight the importance of the use of these spaces and to frame suggestions for their improved use across learning areas. The lack of literature that describes the current use of outdoor learning spaces in Australian secondary schools provides the rationale for this dissertation and underpins the exploration of ways to improve the use of outdoor learning spaces.

Findings from this research provide insight into the many benefits that outdoor learning spaces offer students. This includes building positive human-nature relationships, freedom from the constraints of traditional teaching pedagogies and increased health and wellbeing benefits for students, stimulation and engagement in learning and skills and knowledge acquisition. Challenges and constraints in utilising outdoor learning spaces are also revealed through the systematic review of literature and include a fear of nature exhibited by students and teachers, teachers' lack of confidence and capability in using outdoor spaces for learning across learning areas, and a shortage of resources, leadership, administration support and professional learning for teachers that would support the effective use of outdoor learning spaces. The Discussion and conclusion draw together themes in the findings and highlight the positive relationship between the use of outdoor learning spaces and the effective shaping of adolescent student learning experiences.

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## Introduction

This dissertation explores the use of outdoor learning spaces in shaping student learning experiences in Australian secondary schools. Specifically, the current use of outdoor learning spaces in educational settings and their impact on student engagement and learning is investigated through a systematic review of international and local literature. Connections between these findings and research that describes best practices for engaging adolescents in meaningful learning are used as a lens for gathering and analysing data and presenting and discussing findings.

A definition of outdoor learning spaces used in this dissertation is provided in the Background section. This definition provides clarity about the literature used, the focus of the exploration and the lens for analysis and discussion. The rationale and purpose of the study are then described along with the research questions. This is followed by a literature review where literature is systematically searched to shed light on the use of outdoor learning spaces in secondary contexts in Australia. Findings are then drawn from the review of literature and the thesis is completed with a detailed discussion and conclusion.

## Background

*What are outdoor learning spaces?*

There are a variety of differing views presented in literature about what is meant by *outdoor learning spaces*. One straightforward definition describes outdoor learning spaces as informal spaces extending beyond traditionally designated rooms for learning (Oblinger, 2006; Rafferty, 2012) while Rafferty (2012) also provides an uncomplicated definition of outdoor learning spaces as learning environments without walls or ceilings.

A more reflective definition is provided by Tanner (2000) in relation to research on school design. This description of outdoor learning spaces states that outdoor rooms/ outdoor learning environments are like a classroom, but with the added beauty of nature. A detailed definition using a primary context, is provided by Nuttall and Millington (2008). They state:

*“The outdoor classroom is a design concept for developing school grounds. It is a developmental tool to enhance and value the use of school grounds for learning. It addresses issues associated with teaching and learning practises, play, environmental and structural design and sensitive landscaping for ecological awareness. It is a plan that dismantles the traditional view that the grounds are for sport and play and the classroom is a place for learning. It is a plan for new functions and new forms for school grounds ”(Nuttall & Millington, 2008, p. 81)*



Nuttall and Millington (2008) continue to add even more detail to describe the variance in different designs of outdoor classrooms. They describe some outdoor learning spaces as being natural sites containing plants and landscaping elements such as rocks and water, while other spaces are built sites using permanent structures as the main feature. Nuttall and Millington (2008) also provide a view that most outdoor learning spaces include both natural and built elements. Examples of outdoor learning spaces are provided below in Figure 1, Figure 2, Figure 3 and Figure 4.



Figure 1: (ArbNet, 2018)



Figure 2: (Oak Park School District, 2016)



Figure 3: (BHS Creek, 2014)



Figure 4: (Loughborough University, 2019)

A deeper investigation of literature reveals that some research provides definitions of outdoor learning spaces that include insight into how outdoor learning environments influence students' experiences of learning. This research (Cleveland & Fisher, 2014; Eick, 2012; Galizio et al., 2009; Harris, 2017; Keppell et al., 2012; Preston, 2014; Thomas, 2010; Wirth & Rosenow, 2012) defines outdoor learning spaces as multi-purpose areas for collaborative and independent learning that supports collaborative inquiry, student-centred learning and provides a sense of excitement and release from the confinement of traditional learning spaces.

Similarly, Eick (2012) and Harris (2017) define outdoor learning spaces in relation to their impact solely on primary student interaction and learning engagement. They do not define the physical features of these spaces but describe them as promoting limitless thinking, interaction and connectedness.

Drawing on definitions presented by Oblinger (2006); Rafferty (2012); Tanner (2000), outdoor learning spaces are defined for the purpose of this dissertation, as the limitless spaces beyond the walls of a building provided by and within the natural environment. These spaces include constructed outdoor classrooms such as small amphitheatres, tree stump circles, picnic tables, and free spaces (such as sitting under a tree, on an oval, or in a courtyard). This definition and dissertation do not include, or reference outdoor learning associated with physical education and sport related areas.

An interest in adolescent education and how outdoor learning spaces are seen to shape learning experiences, particularly for students in secondary contexts, gave rise to this study. The variance in definitions and research described in current literature and the absence of references to outdoor learning spaces for secondary students, added impetus to the study and generated guiding questions for investigation.

### *Pedagogical framework*

Student-centred and inquiry-based learning are pedagogical approaches positively acknowledged for their focus on creating capable, independent learners. Outdoor learning spaces provide the informal, collaborative and relational settings that best align with the principles and characteristics of student-centred and inquiry-based frameworks for learning.

These characteristics, in relation to effective practices for adolescent students (Pendergast & Main, 2017), also include a focus on students making meaning through active engagement, internal motivation and positive student and student/teacher interaction (Barrett et al., 2015; Christie et al., 2016; Eick, 2012; Fagerstam & Grotherus, 2018; Jamieson et al., 2000; Oblinger, 2006; Rafferty, 2012; Ruiz-Gallardo et al., 2013) .

Fagerstam and Grotherus (2018) provide support for the use of student-centred pedagogy by describing the positive impact this approach to learning has on promoting student responsibility, authentic problem-solving and student choice. Oblinger (2006) describes the social and interactive environment provided by outdoor learning spaces as being a highly appropriate context for implementation of this student-centred learning approach.

Jamieson et al. (2000) explain inquiry-based learning as being a combination of practical, followed by theoretical learning, with a focus on relationship and making connections. Barrett et al. (2015) supports this definition by highlighting the opportunity for natural inquiry enabled through the use of outdoor learning spaces. Eick (2012) and Rafferty (2012) further support this argument by stating that outdoor learning spaces enhance and promote natural inquiry and promote instinctive decision-making.

The systematic review of literature in this study will be used to investigate the use of outdoor learning spaces as environments for shaping adolescent students' learning through inquiry-based and student-centred pedagogies.

### *Curriculum connections: Outdoor learning within the Australian Curriculum.*

The Australian Curriculum describes the use of outdoor learning as a

*“connection providing framework for students to experience guided, integrated learning across the curriculum in natural environments. Students have the opportunity to gain unique and specific benefits from outdoor learning. They develop skills and understandings while valuing a positive relationship with natural environments and promoting the sustainable use of these environments” (ACARA).*

At first glance, the Australian Curriculum seems to support outdoor learning. The curriculum acknowledges the specific benefits of utilising outdoor learning environments and aligns its use to being supportive of active and hands-on pedagogies. Cross-curricula implementation approaches are suggested for its use along with strategies for designing a safe environment for learning. The acknowledgement in this national document in relation to the importance of utilising outdoor learning spaces for active learning, provides a relevant educational context for this research.

*The development of positive relationships with others and with the environment through interaction with the natural world can be facilitated through outdoor learning. These relationships are essential for the wellbeing and sustainability of individuals, society and our environment. Outdoor learning engages students in practical and active learning experiences in natural environments and settings, and this typically takes place beyond the school classroom. In these environments, students develop the skills and understandings to move safely and competently while valuing a positive relationship with natural environments and promoting the sustainable use of these environments (ACARA).*

However, further analysis of the Australian Curriculum reveals that the recommended use of outdoor learning spaces is only mentioned for primary schooling, (foundation years – year six). In the secondary school curriculum, outdoor education is mentioned but only in relation to outdoor adventure, camps and physical education. As mentioned in the search strategy, outdoor education was excluded, due to its lack of connection with the use of outdoor learning spaces for shaping learning across curriculum areas.

A further investigation of outdoor learning spaces in secondary schools, involved an analysis of curriculum from each state and territory. Findings from this analysis indicate that there are significant differences between year levels, schools and between the different states and territories. Findings that reveal these differences are described below.

Between years 7-10 outdoor education across the states and territories is not offered as its own subject. Conversely it is offered as a minor part of the Health and Physical Education unit and is highly integrated with physical education (ACTBSSS, 2018; Department of Education, 2019; Government of Western Australia, 2014; NSW Government, 2019; NT GOV, 2019; QCAA, 2019; SACE, 2019; VCAA, 2018). The Australian curriculum also includes outdoor learning in geography and science, and mentions the importance of using the natural environment in relation to these subjects (ACARA)

#### *South Australia and Northern Territory*

The Northern Territory Certificate of Education and Training is based on, and administered by the South Australian Certificate of Education (SACE) and offers the same courses as South Australia (NT GOV, 2019). The Outdoor Education course offered by SACE is for stage one and stage two (years eleven and twelve). SACE (2019) identifies that the purpose of the course is for students to create human nature relationships through outdoor activities.

In stage one there are three units, the first being Environment and Conservation followed by Planning and then Outdoor Activities (SACE, 2019). The design of the first unit engages students in learning about Environment and Conservation before completing activities. However, there is no mention or suggestion of this part of the course being taught using an outdoor learning space.

Stage 2 is similar, the initial part of the unit is Environmental Studies and focuses on ecosystems and classifications (SACE, 2019) and similarly makes no mention of using outdoor learning spaces to observe ecosystems in the natural environment. Likewise, other subjects, including Geography and Earth and Environmental Science, do not recommend the use of outdoor learning spaces. There is mention of field work, but only in connection with camps and excursions.

### *Queensland*

Analysis of subjects aligned to the Queensland Certificate of Education (QCE) show that no mention is made in relation to the use of outdoor learning spaces. Nor do they have an Outdoor Education subject. In contrast, the outline for Earth and Environmental Science states that for one experiment, soil from the local environment should be brought into the classroom before the class completes a practical exercise (QCAA, 2019).

### *Victoria*

The Victorian Certificate of Education has a subject called Outdoor and Environmental Education (VCAA, 2018). There is mention of the use of passive outdoor areas for learning in this document, but further analysis reveals that this refers to excursions to farms, and national parks, in addition to outdoor adventure classes.

### *New South Wales*

Like the QCE, the Higher School Certificate (HSC) in New South Wales does not have a separate Outdoor Education course. Rather, it is incorporated in Personal Development, Health and Physical Education (NSW Government, 2019). The outdoor education unit within this subject is also optional and is chosen as an elective by the students. There is no mention of outdoor learning in cross curriculum subjects.

### *Western Australia*

The Outdoor Education course offered in years eleven and twelve in Western Australia focuses on outdoor activities rather than learning in the outdoor environment and is located in the Health and Physical Education learning area (Government of Western Australia, 2014). The course outline highlights activities including bushwalking, sailing, climbing and orienteering. The Government of Western Australia (2014) states that the aim of these experiences is for students to develop relationship with the environment, and foster practical life skills. However, suggested supporting learning experiences do not refer to the use of outdoor learning spaces, and links to cross curricula uses for outdoor education are not apparent.

### *Tasmania*

The senior secondary curriculum in Tasmania offers outdoor education courses: Outdoor Experiences, Outdoor Education and Outdoor Leadership (Department of Education, 2019). These subjects follow on from one another. Outdoor Experiences, and Outdoor Education, appear to be based around outdoor activities. Students learn the skills to perform activities such as aquatic, biking and hiking, and also learn safety and mapping skills. In contrast, the Outdoor

Leadership unit suggests learning experiences beyond physical activities. In this unit students learn about environmental management and human nature relationships and unlike other state and territory curriculums, the Department of Education (2019) outlines that students should expect to be working outside in the field.

### *Australian Capital Territory*

The Outdoor and Environmental Education unit in the senior secondary curriculum in the Australian Capital Territory again focuses on outdoor adventure activities (ACTBSSS, 2018). An interesting aspect of this unit is the focus on students' feelings. A unit goal is for students to learn about mental health through nature.

## **Rationale**

Current research focusses on informal and formal learning spaces, including hubs and communal learning spaces, and their use in kindergarten and primary school settings. However, less research can be found on the specific use of outdoor spaces for learning. The majority of current research relates to outdoor education as physical education, sport, camps and adventure programs.

Moreover, there is a significant absence of research (including national and state-based curriculum documentation) in relation to secondary schools in Australia. A limited number of secondary sources were found, but these originated from studies in Scandinavia, the United Kingdom and the United States. Only one significant Australian secondary school source was identified. This research by Fisher (2005) presented findings from a study focussed on the evaluation of physical spaces designed for learning and included outdoor learning features. As a result, literature sourced and referenced in the literature review of this study was predominantly based on primary and early years research.

This lack of current literature and research on the use of outdoor learning spaces within an Australian secondary school context identified a gap in research and led to this current study.

### *Purpose*

The purpose of this study is to explore how outdoor learning spaces are utilised in secondary schools in Australia and to better understand the influence of these learning spaces on student learning experiences. Important to note is that research in this study will not focus on resulting academic achievement but will be used to shed light on the student's experience of learning and specifically, student engagement, participation, wellbeing, and emotional responses to learning in an outdoor space.

In exploring the use of outdoor learning spaces in secondary schools in Australia, the study seeks to show the potential of outdoor learning spaces in shaping adolescent student learning experiences in secondary schools in Australia. The initial framing of this study embodies the position that the outdoor environment has a positive impact on the physical, emotional,

intellectual and moral wellbeing of individuals (Kellert, 2005; White, 2001; Wilson, 1984) and that an understanding of, and connectedness with the natural environment promote sustainable beliefs for the future (ACARA). The following literature review aims to identify the benefits and limitations of outdoor learning spaces, then through methodological evaluation and disussion, will attempt to answer the following research questions:

- How are outdoor learning spaces currently being used in secondary schools in Australia?
- How can the use of outdoor learning spaces be improved?
- What is the potential for further utilisation of outdoor learning spaces?

A systematic exploration of literature will be used to enlighten *the use of outdoor learning spaces in shaping student learning experiences in Australian secondary schools*.

## **Literature Review**

The following systematic review of literature provides an in-depth review of existing literature in relation to the use outdoor learning spaces. It also provides a basis for understanding the importance of utilising outdoor learning spaces in secondary school environments. Contrastingly the constraints and concerns related to using these spaces for learning will also be discussed.

All literature reviewed was sourced from books and peer-reviewed journal articles. A report commissioned by the UK government by Malone (2004), frequently referenced in other pieces of literature, was also reviewed but considered to be less credible as it could not be identified as peer-reviewed. Due to a lack of Australian literature focussed on secondary education, literature sourced in this review was predominantly international. The UK, Sweden and Denmark are main origin sources with Denmark having the most available research and experience in utilising outdoor learning spaces. In Denmark this is called *Udeskole*, which translates to ‘outdoor school’, and describes the regular practice of implementing learning in an outdoor setting beyond individual or specific lessons (Bentsen et al., 2013). International literature provides significant insight into current practices, identifies challenges and successes of outdoor learning spaces and provides a basis for application to an Australian context.

Also, important to note is the variance in the education level referenced in the literature sources. Due to a limited range of secondary level sources available, alternate education level sources, specifically upper primary and tertiary, have been used. Including sources other than secondary level enabled a comprehensive and thorough review of literature and provided a basis for the application of findings to a secondary context.

More than thirty sources of literature, including journal articles and books were identified as most relevant and were explored, analysed, compared and evaluated. By entering the literature into a table, the most common themes were identified and constructed along with many sub-themes. From this thorough review of literature five themes were identified and used to report

upon the intrinsic value of outdoor learning spaces for shaping student learning. This research method will be discussed further in the methodology section of this dissertation. The following five main themes and their subthemes have been used to present the review of literature.

1. Human–nature relationships
  - Environmental understanding
  - Action based/placed pedagogy
2. Freedom from constraints
  - Independence/ Student centred learning
  - Teacher student relations
3. Health and wellbeing
  - Emotional wellbeing
  - Physical wellbeing
  - Wellbeing for people with learning disabilities
4. Stimulation and engagement
  - Motivation
  - Participation
  - Disengaged students/ students with behavioural issues
5. Skills and knowledge
  - Academic skills and knowledge
  - Critical thinking and inquiry
  - Social skills
  - Practical skills

Research that highlights the constraints and concerns related to teacher and school hesitancy to implement outdoor learning spaces has been described under three themes. The third constraint is separated into three subsections.

1. Fear of nature
2. Teachers' lack of confidence and capability
3. Lack of resources
  - Lack of natural spaces
  - Lack of school administration support
  - Lack of pedagogical freedom

#### *Human–nature relationships*

*When learners interact with the local environment, they develop a closer relationship with nature* (Malone, 2004, p. 64)

#### *Environmental understanding*

Research by Kellert (2005), Wilson (1984) and White (2001) identifies the decline of Biophilia which is the human disposition to feel connected to, and empathetic with, the natural environment. The decline of Biophilia is attributed to an increase in Biophobia, the fear of nature. Research indicates that this is especially evident amongst young people. Kellert (2005),



Wilson (1984) and White (2001), argue that the increased use of outdoor learning experiences would help to restore Biophilia and also build knowledge and respect for sustainability practices (Kellert, 2005). This research underpinning Biophilia with its basis in human-nature relationships has significant implications for positively shaping the experiences of secondary students.

Christie et al.'s (2016) research involving human-nature relationship, involved the application of a primary school outdoor learning program called 'Outdoor Journeys' to a secondary context. Their research specifically focussed on the response of three secondary schools, their students and teachers. This observation-based research project from Scotland involved a three-step process of questioning, researching and sharing. Findings of this research revealed that 89 percent of pupils preferred the Outdoor Journeys program to traditional classroom teaching. Teachers from two out of the three schools supported the program and indicated that they would implement it beyond the study. However, the remaining school teachers would not continue the program due to the feeling of unfamiliarity. Christie et al. (2016) describe the findings of the project as reflecting positive and negative relationships between people and environment, with outdoor learning spaces evoking the feelings of connectedness students and teachers have towards the natural world.

In her comprehensive review of literature focussed on learning outside the classroom Malone (2008) reports similar findings in relation to attitudes and relationship between humans and nature, to those of Christie et al. (2016). Within this report Malone (2008) describes significant positive findings for the success of outdoor learning spaces and draws attention to the predominance of positive attitudes of individuals towards environmental responsibility. Cumming and Nash (2015) reiterate these positive attitudes and share findings that describe the feeling of belonging expressed by individuals after working in an outdoor learning space.

The notion of relationship between human and nature is also explored in the Forest School project created in the UK. This project promotes the use of natural environments in learning and has been implemented by Harris (2017) and Cumming and Nash (2015). The latter researchers applied the Forest School concept within an Australian context. This case study was undertaken in an upper primary setting in a school in Western Australia (students aged twelve years). The school was surrounded by bushland and coastline, placing it in a prime location for the utilisation of outdoor learning spaces. Findings from this case study by Cumming and Nash (2015), indicate that students involved experienced a sense of belonging in response to the Forest School approach. They state that this was specifically the case with students struggling both academically and behaviourally. According to Cumming and Nash (2015) success of outdoor learning spaces for this cohort of students can be explained by the outdoor learning environment providing these students with an alternative context for learning. For these students the traditional classroom is alienating and disconnected. They state that the connection to land can also be strengthened by continuous visits to outdoor learning areas and by the continuous use of the Forest School approach.

Malone (2008) also focusses on the relationship between humans and nature in relation to connectedness. Connectedness is described as the influence of learning outdoors on increasing students' understanding of the environment and the content (Malone, 2008). Connectedness is often recognised in relation to learning areas such as science and geography, however, according to Christie et al. (2016) and Harris (2017) connectedness can exist effectively across all subjects of the curriculum.

A study by Palmberg and Kuru (2000) using qualitative methods, observed and recorded the progression in the environmental attitude of twelve and thirteen year old students during an outdoor learning program. They argued that the depth of students' understanding of the environment can increase their awareness of problems that the environment may be facing. This increased empathy for the environment and connectedness is a positive outcome of engagement in outdoor learning education (Palmberg & Kuru, 2000).

#### *Action based/placed pedagogy*

A report constructed by Bloom et al. (2010) reflecting on the differences in the implementation of outdoor learning spaces in the United States and the United Kingdom, found that a change in curriculum guidelines was required. Also identified was the need for professional development for teachers to improve their design and implementation of learning in outdoor spaces. Implemented effectively, outdoor learning results in deepened understanding, personal connectedness, sense of belonging, and a feeling of environmental value and responsibility. It can also evoke and promote students' environmental and sustainability activism (Christie et al., 2016; Cumming & Nash, 2015; Malone, 2008). This is highly relevant for secondary students who are well aware of the environmental issues Earth is facing.

Gislason (2009) provides qualitative research on the design of buildings with an Environmental Studies focused outlook and their impact on human - nature relationship. Effectiveness of the design of buildings that supports active and student-centred pedagogies also supports engagement by students, increased learning potential and intensified pro-environmental beliefs and activism ((Bloom et al., 2010; Gislason, 2009; Malone, 2004).

Pro-environmental beliefs and activism as positive outcomes of outdoor learning programs are supported by an action-based pedagogy (Barthel et al., 2018; Ponder & Cox-Peterson, 2010). Barthel et al. (2018) provide rich and interesting qualitative data on how "*direct sensory contact and significant experiences*" (p. 1) of interacting with threatened species (physically saving them from entrapment), resulted in the development of relationship, deep understanding and responsibility. In a qualitative study, Ponder and Cox-Peterson (2010) analyse the way the curriculum can be adapted and taught to have greater connection with environmental significance. This adaptation involves a pedagogy that encourages critical discussions and higher order thinking. Ponder and Cox-Peterson (2010) argue that this pedagogy gives rise to activism. Malone (2004) contributes to this argument by asserting that students have "*the right to engage, connect and respond to nature*" (p. 53) through the use of outdoor learning spaces.

She also acknowledges students' sense of responsibility for the environment, their biophilia and their right to "*participate in and contribute to global sustainability*" (Malone, 2004, p. 53).

Eco strategy is another approach for developing human – nature relationship. This term is used by Bentsen et al. (2013) and describes the way teachers are using outdoor spaces. The researchers describe how teachers develop an understanding of conservation by taking students to visit a natural area with heavy human impact, such as a park or beach, and an area with minimal human influence. Students are encouraged to compare the environments and consider the impact of humans.

*Global warming, environmental stewardship, energy awareness, recycling, the aftermath of natural disasters, and, yes, concern for threatened and endangered organisms are just a few connections between science (and other subjects taught outside) and action projects... Classroom lessons can be taught and soon forgotten, but the passion, commitment, and emotional expense of an action project ensures its cognitive value and longevity, as well as the preparation of civic-minded individuals who gain problem-solving and decision-making skills for the future. (Ponder & Cox-Peterson, 2010, p. 137)*

Literature reviewed in this section has revealed the positive impact of outdoor learning spaces and related pedagogies on consolidating and expanding the human – nature relationship. The importance of enhancing this relationship is demonstrated through literature that describes how an increased understanding of environment raises awareness of environmental issues, sparks an interest in environmental activism and supports the future of environmental sustainability.

### *Freedom of constraints*

#### *Independence/ Student-centred learning*

An in-depth qualitative case study by Rafferty (2012) describes and analyses how recreational spaces at Charles Sturt University in Australia are used as learning spaces and how the campus at Albury-Wodonga is an efficient green design with many outdoor learning spaces. Rafferty's (2012) observations focussed on one subject to determine the way students and teachers regularly used outdoor learning spaces, across all classes and at all times of the year. In his findings, Rafferty describes the highly relational approach to learning where students were given the choice to decide the space for their learning to take place. The choice of outdoor learning space provided freedom from constraints normally imposed by formal learning spaces and increased motivation and stimulation for learning (Rafferty, 2012).

A narrative case study by Eick (2012) focuses on the teaching practices of a year three teacher in America. Similar to findings from Rafferty's (2012) study, Eick (2012) reiterates the ideas of freedom from constraints provided by outdoor learning spaces. The teacher in this study is passionate about the outdoors, has a high profile within her school and community and is influential in encouraging other teachers to use outdoor learning spaces (Eick, 2012).

*When I run into students that I've had a long time ago, that's the one thing that they tell me. I remember when you took us to the woods. I remember when you did science with us. — Susan (Eick, 2012, p. 789)*

The study follows her class and gives exemplary examples of how she has positively affected her students learning experiences through her passion for the outdoors. With the help of this teacher, the school has created a number of new outdoor learning spaces, including an amphitheatre. In the study, Eick (2012) used observation and surveys to gain evidence of how the teacher in the study shaped the students' learning. Test scores were also viewed. They indicated that only one student had difficulty passing, while all the other passed easily. Through survey and observation, it was evident that students were excelling in the outdoor classroom. This was evidenced by the students' better use of communication and expression, critical and creative thinking due to the lack of restraint from traditional indoor classrooms.

Montgomery and Millenbah (2011) further support Rafferty's research by affirming that freedom of expression and active kinaesthetic learning shaped by the context of outdoor learning spaces, despite challenges presented by the outdoor environment, achieves a high success rate in relation to student motivation and the progression of learning.

*The stellar performance of students in the outdoor group following the initial tutorial is very interesting, given that environmental conditions proved challenging ... we attribute this success to the power of the students connection with the learning space (Montgomery & Millenbah, 2011)*

Feelings of freedom from the restrictions of a traditional classroom lead to a sense of independence and student-centred learning. The "*feeling of independence*" (p. 426) created by outdoor learning spaces is an important and desirable consideration for secondary schooling (Christie et al., 2016). In this study the students interviewed also suggested that the pedagogy used in outdoor learning spaces supported student agency, independence and a student-centred approach. The implementation of student-centred learning encourages deeper knowledge and understanding and promotes higher-order thinking where the students can build upon each other's knowledge to discuss and evaluate their ideas (Gore & Ladwig, 2003).

Fagerstam and Grotherus (2018) build upon the notion of independence in relation to outdoor learning spaces through a qualitative case study located in Sweden. With a specific focus on the academic and emotional impact on secondary students, they intentionally applied a student-centred pedagogy to an outdoor learning context to create a sense of freedom and independence. They found that the students in their study learned together and from each other, they made their own decisions, chose effective learning pathways and took responsibility for their own learning and success. This research is interesting as Fagerstam and Grotherus (2018) acknowledge that although this student-centred approach was successful, some negative outcomes in relation to keeping focussed on the actual learning content were apparent.

### *Teacher student relations*

An earlier case study from Fagerstam (2014) consisted of interviews from high school teachers sharing their views on the impact of outdoor learning spaces on student learning. Teachers indicated that their teaching was strengthened by the use of the outdoor spaces, and most importantly, they thought teacher and student relationships were also strengthened through the student-centred approach. Fagerstam (2014) further suggests that the teachers interviewed felt empowered to give students more appropriate time for individual help. Additionally, teachers indicated that an outdoor learning space provided more opportunity for students to ask for help without the scrutiny of their peers. This raised student confidence and reduced the possibility of embarrassment often experienced by secondary aged students when asking for help.

Research from Ruiz-Gallardo et al. (2013), similarly describes the positive teacher-student relationships which are formulated by outdoor learning spaces. Ruiz-Gallardo et al. (2013) describe the impact of outdoor learning spaces, specifically gardens, with students considered 'at risk' or 'disengaged'. Research findings provide evidence of positive teacher-student relationships forming from the program. The teachers interviewed stated that in general, relationships between students and teachers may be strained due to a common student view of the teacher as the enemy and "*the teacher is against us*" (p. 254). They stated that this view was most commonly shared by students "at risk" and when students felt they were being forced to attend school (Ruiz-Gallardo et al., 2013). After running the outdoor learning program, the teachers indicated that this teacher-student relationship had been turned around. They recorded that the students' new understanding reflected an image of the teacher as someone to help them and work with them.

### *Health and well being*

To stay aligned to the research focus, the extensive area of health and well-being has been narrowed to focus on emotional and physical wellbeing. How these two areas have improved, will be the focus for the review of literature.

### *Emotional wellbeing*

Emotional wellbeing is key to a student's happiness, enjoyment and motivation in secondary school and is often reflected in students' participation in learning and school life. In many of the sources reviewed findings show that students' happiness and positive emotions are significantly enhanced while utilising outdoor environments. Fagerstam (2014) and Fagerstam and Grotherus (2018) identify positive emotions present in students when engaged in learning in outdoor environments. This positivity is apparent when working with other students, the teachers, and during their lessons. Findings also indicate that students are more alert when they are outside rather than in indoor settings. The extensive literature review from Malone (2004) provides an in-depth analysis of the cognitive and psychological benefits from outdoor settings. This is further supported by the retention research from Eick (2012) and Montgomery and Millenbah (2011).

The later study by Malone (2008) raises the issue that the benefits of outdoor learning on mental health, self-esteem and positive emotional development in adolescents, including: nurturing, tolerance, resilience, and empathy, can be over-looked by the convenience of implementing learning in traditional spaces. Palmberg and Kuru (2000) and Ruiz-Gallardo et al. (2013) provide support for the relationship between self-esteem building and outdoor learning spaces by stating that students are less intimidated and embarrassed to share their ideas when they are outside compared to being in the confinement of a classroom. This also aligns to the theme of freedom previously described.

An article by Dillon (2006) describes outcomes from recent research in relation to outdoor classrooms. In this article Dillon (2006) states that there is evidence of increased positive attitudes and beliefs, actions and behaviours, increased self-confidence, and belief in personal ability as a result of outdoor learning. Dillon (2006) states “*that students acknowledged unexpectedly that learning could be fun*” (p. 5). Similarly, these findings are well recognised throughout other research (Fagerstam, 2014; Fagerstam & Grotherus, 2018; Malone, 2004, 2008; Palmberg & Kuru, 2000; Ruiz-Gallardo et al., 2013).

### *Physical wellbeing*

Similarly, Harris’s (2017) study of Forest School in the UK, revealed that the students’ emotions were visibly and consistently positive and concluded that outdoor learning spaces support students’ personal and emotional development and wellbeing. Harris (2017) also noted that engaging in learning experiences in outdoor spaces impacted positively on the physical health of the students. This was supported by studies undertaken by The South Australian Department for Education (2018); Dillon (2006); Malone (2004, 2008), and Rafferty (2012) and was extended to include students with disabilities by Eick (2012). Malone (2008) also supports this argument and identifies specific evidence in relation to improved physical fitness. This included improved coordination, nutrition and motor skill development, - “*highly impacted by sensory and tactile experiments*” (p. 16)

Further research from, Galizio et al. (2009) found children engaged in outdoor learning spaces were having less time off due to illness and de-motivation. Galizio et al. (2009) wrote an article about their school, describing the endless possibilities of the outdoor classroom.

*I believe that to offer children this kind of [outdoor] environment, almost on a daily basis, helps all of us see that “school” can be anywhere. An open, quiet environment in the natural world promotes real listening. Outdoor spaces, like the Wetlands, are rich with possibilities for students and teachers alike. As each day changes and the seasons change, the students notice subtle differences in nature and also in each other. Their relationships grow and change, both with each other and with the earth around them – Carolyn Galizio (Galizio et al., 2009, p. 42)*

### *Wellbeing for people with learning disabilities*

The benefits of outdoor learning spaces are also significant for students with a learning disability. Research indicates that there has been substantial success, through engagement in outdoor learning spaces, for students with attention deficit disorders (Harris, 2017; Malone, 2008; Owens, 2012; Wirth & Rosenow, 2012). Harris (2017) adds to this research by describing the freedom and relaxed nature of the outdoor classroom, with reduced noise and distraction and the increased potential for student concentration and motivation.

*Children diagnosed with attention deficit disorder who have regular, appropriate connections with the natural world show an improvement in concentration. (Wirth & Rosenow, 2012, p. 43)*

A dissertation by Owens (2012) explored the knowledge, values, beliefs, and attitudes of students engaged in a middle-years outdoor learning program called ‘Natures Classroom’ in South Florida. Specifically, Owens (2012) focused on exploring the benefits to students with attention deficit disorders. One teacher who was interviewed as a part of the dissertation noted that a student with attention deficit disorder does not feel the same “*impending failure*” (p. 242) outside that they often do confined within a traditional classroom. In addition, she notes that outdoor education provides all students with “*an even playing field*”(p. 227), no student has an advantage or disadvantage.

Studies by Eick (2012), Galizio et al. (2009); Harris (2017) were all conducted in primary settings. However, it is evident that these kinds of programs can be implemented in different settings, and therefore the findings can be applied to secondary contexts.

### *Stimulation and engagement*

#### *Motivation*

Increased engagement and stimulation in learning as a result of engaging in outdoor learning spaces is described in a narrative case study by Eick (2012). In this study, a teacher describes how she utilises outdoor spaces in an inspirational way that promotes high levels of engagement and motivation for her students. Similarly, Harris (2017) describes increased engagement through cross-curriculum approaches to learning in an outdoor environment. Eick (2012) also acknowledges the positive impact outdoor learning spaces have on engaging students with learning difficulties. Further, freedom of expression and the more hands-on experiences through outdoor learning, increases excitement, engagement, motivation and success (Department of Education SA, 2018; Eick, 2012; Galizio et al., 2009; Harris, 2017; Montgomery & Millenbah, 2011)

Dyment (2008) also investigates engagement levels of both primary and secondary students in a green school in Canada. The findings from this research support those from Harris (2017), with engagement levels of students involved in outdoor learning spaces having a positive impact on motivation in all aspects of their schooling, not just those typically associated with the outdoors (Dyment, 2008). An alternative idea is presented by Fagerstam (2014) who

describes the use of outdoor learning in stages and as a way to support schools using cross-curriculum and inquiry approaches to learning. This approach involves one class operating in an outdoor learning environment at a time. This experience is designed to act as a stimulus and initiates student inquiry. The next stage of learning is indoors where the students continue to research and present their investigations (Fagerstam, 2014). This cycle is repeated continuously. This idea was similarly mentioned by Harris (2017), but in relation to a primary school context and provides an example of the transferability of research findings across stages of schooling.

An Australian literature source by Preston (2014) provides a report that investigates how students view outdoor and environmental education in Australia at a lower tertiary level. Preston (2014), although mostly focusing on activities such as field trips, presents the idea that outdoor learning spaces are seen to provide the practical aspect of learning, while indoor spaces enable theoretical learning. He states that students perceive “*practical as fun and theory as a chore*”, (p. 181), and are therefore more excited and motivated to engage in learning in outside spaces. This supports Harris (2017), and Dymont (2008) and their findings of increased engagement, motivation and participation as a result of learning in outdoor spaces.

### *Participation*

The finding of increased participation as an outcome of learning outside is also supported by Fagerstam (2014) who states: “*generally, all teachers agreed that participation from students escalated and they began to actively participate in discussions in an outdoor setting*” (p. 66). This also relates to the freedom theme, with findings from Fagerstam (2014) indicating that students exhibited a relaxed feeling, free from embarrassment or pressure. Also supporting this theme is the research by Ruiz-Gallardo et al. (2013). A review of this literature revealed that participation was significantly heightened for two reasons: deepening understanding of the content, and less embarrassment and anxiety related to speaking up in front of a class (Ruiz-Gallardo et al., 2013).

*Indoors, walking up to the board and [presenting] is more of a ‘thing’. Outdoors, it all becomes more relaxed, at least that’s how I feel. I think indoors presentations hold back many students, outside they become more confident. The students that are a bit more shy benefit from this - Harry [student interview] From: (Fagerstam, 2014, p. 66)*

### *Disengaged students/ students with behavioural issues*

A very interesting aspect of the Stimulation and Engagement theme is the sub-theme of Disengaged students and students with behavioural issues (not including students with learning disabilities as mentioned previously). Fagerstam’s (2014) research indicates that the boundaries between high and low achieving students were challenged when in an outdoor learning space setting, with the outdoor space providing a more equitable learning environment for all students. This is supported by the literature of Ruiz-Gallardo et al. (2013) and reveals that students referred to as disengaged or at risk generally have a dislike, or a lack of interest in school, with many of these students indicating that they feel forced to attend school (Ruiz-Gallardo et al., 2013). According to this research, this feeling of disengagement is often



attributed to students believing they are not smart enough for the classroom context, intense embarrassment about their knowledge and skills and not understanding what is being taught. Ruiz-Gallardo et al. (2013) indicate that when these disengaged students were introduced to a garden program, where outdoor learning spaces were utilised for both theory and practical work, motivation and participation improved. According to Ruiz-Gallardo et al. (2013) curriculum content also needed to be tailored to student’s needs, abilities and interests. Pedagogies that involved active, judgement free, hands-on learning, and strategies that enabled teacher and students to work together collaboratively, were employed.

Findings from this study by Ruiz-Gallardo et al. (2013) indicates that motivation, curiosity, engagement, improved perception of school and self, self-confidence, self-esteem and the sense of accomplishment improved. Further results also revealed that potentially violent students displayed reduced aggressiveness and violent tendencies as a result of the natural calming atmosphere provided by outdoor learning spaces (Ruiz-Gallardo et al., 2013). Figure 5 below is an overview of the progress this program had on the participating students.

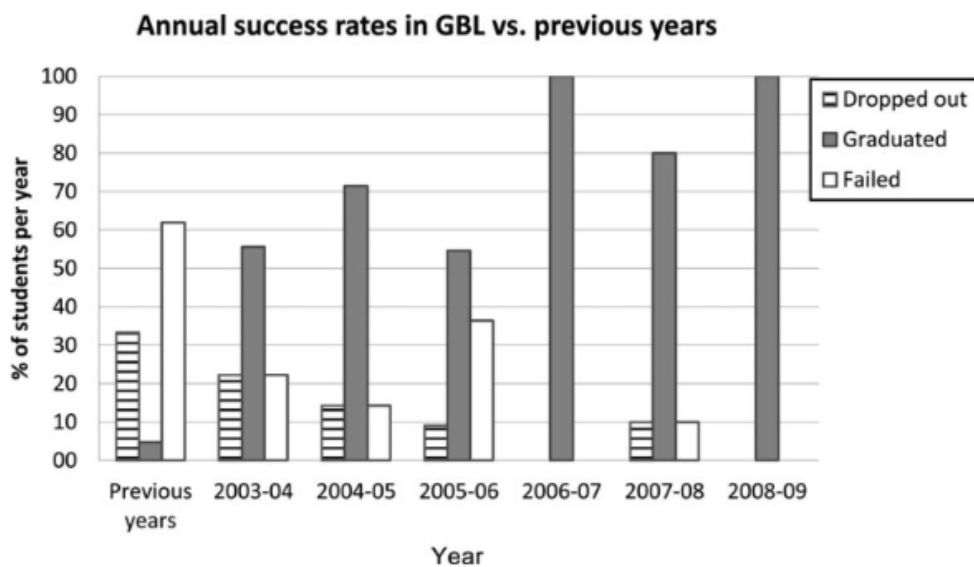


Figure 5: Success rate of garden program for disengaged students. Source (Ruiz-Gallardo et al., 2013)

### *Knowledge and skills*

The theme of knowledge and skills has been broken down into a number of sub-themes to cover the main possibilities presented by outdoor learning environments.

### *Academic skills and knowledge*

Montgomery and Millenbah (2011) provide compelling evidence in their literature for the increase in the acquisition of knowledge and skills as a result of students being engaged in outdoor learning contexts. The aim of Montgomery and Millenbah’s (2011) study was to identify if retention of knowledge differed between environments. The study focused on the differences in retention of knowledge in different environments. This study involved teaching

university students how to tie a hard knot, and then testing them to see if they remembered how to tie it at different time intervals. The retention of knowledge was significantly higher when the students learned to tie the knot in an outdoor environment compared to an inside space. The results revealed that 94 percent of the outdoor group were successful after initial teaching compared to the 71 percent of the group taught indoors. The findings were especially surprising to the researchers as the conditions outside were cold resulting in the students needing to wear gloves to tie the knots. The researchers contribute this high success rate entirely to location and the emotional connection and feelings of freedom associated with outdoor learning (Montgomery & Millenbah, 2011). The increased retention of knowledge in outdoor spaces is further supported by Dillon's (2006) study, which attributes retention to enjoyment. The study also found that outdoor learning spaces are more likely to have significant cognitive impact on students than in indoor environments (Dillon, 2006).

Similarly, Eick (2012), Harris (2017) and Rafferty (2012) conclude that outdoor learning experiences and spaces result in a heightened progression of skills and knowledge culminating in significant student gain. Rafferty's (2012) study indicated that engagement in outdoor spaces resulted in learning beyond skills acquisition, and in deep transferable understanding and learner agency. Likewise, Eick's (2012) case study involving a teacher (Susan) and her utilisation of outdoor learning spaces across all learning areas reports a high level of success in student motivation, learning gain and engagement.

### *Critical thinking and inquiry*

Critical thinking and inquiry are acknowledged as being an important element of student-centred learning. This pedagogical approach is a feature of outdoor learning. Christie et al. (2016) found that student-centred learning provided a framing for students to initiate their learning, ask questions and engage in critical thinking. Research from Gislason (2009) and Malone (2008) supports this evidence and in addition found that students engaged in outdoor learning and deep critical thinking and inquiry also developed higher-order observational and analytical skills, and improved their decision-making and problem-solving abilities.

### *Social skills*

There is a significant amount of literature that provides evidence for the growth of social skills in response to engagement in outdoor learning spaces. Fagerstam (2014) and Fagerstam and Grotherus (2018) describe the learning which occurs in outdoor learning spaces as being a very social experience at a school and community level. Outdoor learning spaces are often community spaces, for example; the beach, a national park, a local garden or playground. This is specifically the case for schools which lack natural environments, such as schools in an urban environment or low socioeconomic areas (Malone, 2004). Engaging in community-based outdoor spaces for learning requires students and teachers to interact with the wider community and therefore encourages the development of social skills.

In relation to the school environment, Fagerstam (2014) found that students were more inclined to help each other when someone was struggling (academically, physically and emotionally)

in outdoor learning spaces than in traditional classrooms. Fagerstam's (2014) findings indicated that this was due to the less competitive and more inclusive setting provided by the outdoor context. Similarly, Ruiz-Gallardo et al. (2013) found the inclusive nature of outdoor environments resulted in a welcoming and more social environment where communication skills were practiced and developed collaboratively. Malone (2004) also provided evidence for the increase in verbal and interaction skills as a result of engagement in outdoor learning spaces. She also stated that the free flowing outdoor environment provided an easy space for the social and emotional interaction between students (Malone, 2004).

### *Practical skills*

The literature above also draws attention to the importance of the development of social and practical skills for 'real life' application. This highlights the effectiveness of the outdoor learning context, the significance of the pedagogies used, and activities designed by teachers as being fundamental for the success of students after they graduate-school. Fagerstam (2014) describes the development of social skills in outdoor learning contexts as having a significant impact on students and how they function within, and contribute to, community and society post school graduation. In addition, Fagerstam (2014) and Fagerstam and Grotherus (2018) highlight the importance of high-level communication and practical skills needed for work environments. Examples of practical skills include field work skills for science research, trade skills for contractor and tradesperson work, orientation skills for mathematical or geographical work and artistic skills needed by artists and musicians.

According to Ruiz-Gallardo et al. (2013) building practical skills is especially important for disengaged learners. It contributes to their growth and confidence and increases their employment prospects and feeling of success. Fagerstam (2014) supports this by arguing kinesthetic learning results in optimal knowledge, understanding and enjoyment. How students are taught and engaged in outdoor learning spaces is significant in positively shaping students' future.

*The embodied and multisensory experience of the outdoor environment stimulates the interaction between distributed brain areas and consequently robust long-term episodic memories are produced (Fagerstam, 2014, p. 57).*

### *Constraints*

Rickinson et al. (2004) are frequently referred to in literature sources (Carrier et al., 2013; Dillon, 2006; Dyment, 2008; Fagerstam, 2014; Malone, 2008) as providing the leading research in identifying and analysing the barriers surrounding outdoor learning spaces and what prevents this context being utilised to its full potential. Rickinson et al. (2004) undertook a substantial literature review of 150 sources to identify the common barriers. From this review Rickinson et al. (2004) categorised the constraints and concerns related to the use of outdoor learning spaces into five categories:

1. *Fear and concern about young people's health and safety*
2. *Teachers' confidence and expertise in teaching and learning outdoors*
3. *The requirements of school curricula*
4. *Shortages of time, resources and support*
5. *Wider changes within the education sector and beyond*

(Rickinson et al., 2004, p. 51)

These categories from Rickinson et al. (2004) align with themes identified in this literature review in relation to constraints and concerns for the use of outdoor learning spaces with the exception of the fifth category: "*Wider changes within the education sector and beyond*". These constraints will be explored in relation to secondary school education in Australia in the coming sections.

### *Fear of nature*

Biophilia, which was discussed under the human-nature relationships theme at the start of the literature review in relation to constraints of outdoor learning spaces, has its opposite in Biophobia. Wilson (1984) defines Biophobia as an aversion and fearfulness towards, and a discomfort in, natural environment. Carrier et al. (2013); Kellert (2005) and White (2001) provide a more current perspective on Biophobia by describing it as 'nature deficit disorder' and involves negative feelings towards nature – the opposite of Biophilia. The study from Nedovic and Morrissey (2013) analyses primary aged students' feelings towards nature. Findings of this study indicate that Biophobia often occurs when individuals see nature as a "*disposable resource*" (p. 281) and when they have no sense of responsibility or understanding of environmental sustainability (Nedovic & Morrissey, 2013). Essentially, Biophobia occurs when there is no human-nature relationship or connectedness as described earlier in the literature review.

Nature can be dangerous. In Australia the risk of poisonous snakes and spiders are an example. Additionally, weather can be an issue, especially in the summer months when sun damage is high. However, the danger of these natural features is not limited to specific outdoor learning and can to some degree be controlled through the safe management of spaces during their use. Rafferty (2012) describes the effective management of outdoor learning spaces in his university study. In this study he describes how on a rainy day the students would congregate in a covered outdoor area, in spring they would be in a space abundant with fauna, while on a hot summers day they would utilise shaded areas with a good breeze (Rafferty, 2012).

The study from Carrier et al. (2013) presented contrasting findings from the rest of the literature. In this study they compare experimental science classes, indoors and outdoors. The overwhelming responses from the teachers and students in this experiment displayed feelings of discomfort in relation to outdoor learning areas. The reasons for discomfort were described as a general aversion to nature. According to Carrier et al. (2013) a feedback loop can be seen to exist in this research: fear and anxiety for the outdoors creates reluctance to engage in outdoor pursuits. This leads to increased fear and anxiety about outdoor experiences and amplifies reluctance to engage in outdoor learning.

Carrier et al. (2013) also reveals that teachers were the most adverse to engaging in outdoor learning spaces and expressed their discomfort more strongly than students. The researchers suggest the teachers' reluctance and feelings of discomfort may have shaped students' attitudes and experiences towards the outdoor learning environments. They also suggest that with extended training in pedagogical approaches suitable for outdoor learning, the negative experience of teachers may be counteracted. The negative attitude of teachers towards the use of outdoor learning spaces is also mentioned by Dymont (2008) and Nedovic and Morrissey (2013), and is seen to directly impact on the attitude and experience of students and the under-utilisation of outdoor learning spaces

Teachers, parents, school leadership and administration, and the students themselves all have unique perspectives in relation to their concerns for safety in nature (Carrier et al., 2013; Rickinson et al., 2004). Concerns can stem from fear of flora and fauna, fear of accidents, and apprehension about weather (Carrier et al., 2013; Galizio et al., 2009; Harris, 2017; Rickinson et al., 2004). It is concerning that fear of these natural features and possible occurrences are stymying the use of outdoor learning spaces, therefore denying students the experience of outdoor learning and possibly increasing the chances of developing Biophobia or a nature deficit disorder.

According to Carrier et al. (2013) the fear of litigation and being sued for exposing students and teachers to outdoor conditions where fauna and poisonous flora may be present, can create issues for school leadership and administration. A significant connection could be drawn from these findings due to Australian flora and fauna, but also weather-related dangers. Because of this fear, schools may limit the amount of outdoor learning offered to students. Consequently, schools may place limitations on areas and times of the year when outdoor spaces can be utilised. Dymont (2008) after reviewing the limitations of outdoor learning spaces, acknowledges that in his study, there was little fear. The school authority had engaged in effective risk management analysis and planning and could clearly describe the health and safety measures in place for the use of outdoor spaces (Dymont, 2008). Literature reviewed clearly indicates that effective training and increased knowledge from all stakeholders involved in the use of outdoor learning spaces would reduce fear and concern. Similarly, building an awareness of the difference between hazard and risk would assist teachers, students and parents in understanding the low level risk posed by the outside environment (Galizio et al., 2009; Wirth & Rosenow, 2012).

#### *Teachers' lack of confidence and capability*

It is important to acknowledge that teachers who lack confidence and expertise in outdoor learning spaces, are not incapable of teaching outdoors. Lack of confidence implies that a teacher may not know how to utilise and teach in an outdoor space with effective pedagogies and strategies for management. This may be due to the teacher's personal aversion to nature, lack of training or little or no experience. In their research Carrier et al. (2013) identify challenges impacting on teachers' confidence and expertise in designing teaching and learning experiences outdoors.

*It's not always obvious how to use these spaces, especially when you have a standard routine and you've always taught in a classroom – interviewee school 2 (Dyment, 2008)*

One of the main findings in relation to a teacher's lack of confidence in using outdoor spaces for learning, revealed through the research from Carrier et al. (2013), is that teachers were worried about losing control of the students. They suggest that this could be a result of teachers not having experience with inquiry-based or student-centred learning pedagogies. Dyment (2008) supports this research by suggesting that teachers can become fixated with a traditional teaching pattern and struggle to apply less constrained teaching pedagogies. She also suggests that teachers may like the feeling of security when an entire lesson can be mapped out, including discussions, questions, and answers. The more dynamic and responsive pedagogy involved in outdoor learning may cause insecurity, lack of confidence and therefore fear (Dyment, 2008).

Dyment (2008) repeatedly states that teachers who prefer heavily planned lessons and contexts for learning may lack confidence with the teaching of their subject, may align certain pedagogies to specific learning areas and may not be comfortable in incorporating cross-curriculum strategies. Carrier et al. (2013); Eick (2012); Harris (2017); Wirth and Rosenow (2012) provide support for this idea and suggest that teachers' preconceived ideas and experiences about pedagogies related to specific learning areas may impact upon teacher confidence in utilising outdoor learning spaces in learning areas other than Science, Physical Education and Geography.

#### *Lack of resources*

*For many children across the globe, whether in low or high income nations, growing up in the 21<sup>st</sup> century will mean living in overcrowded, unsafe and polluted environments which provide limited opportunity for natural play and environmental learning (Malone, 2004, p. 53).*

#### *Lack of natural spaces*

Natural spaces, including parks, trees and forests, are diminishing due to globalisation and population growth. This in combination with poorly, unattractively designed school grounds, city schools and lack of green space, limit the possibility of outdoor learning environments (Dyment, 2008; Galizio et al., 2009; Malone, 2004; Nedovic & Morrissey, 2013; Wirth & Rosenow, 2012). In Australia there is a growing awareness about the importance of purposefully constructing schools with outdoor learning spaces. These spaces require careful design to shape positive learning experiences for students.

A presentation by Fisher (2005) for the department of Education and Training in Victoria, described a range of schools focussed on constructing outdoor spaces for learning. These spaces were being carefully constructed to enable effective pedagogies and ensure a safe and secure environment. All but two examples were primary schools. The two secondary schools which had plans for the creation of outdoor learning spaces are shown below (Figure 6 and Figure 7). One other high school (Figure 8) described in the presentation does not actually have a specific outdoor learning space but does state that every classroom has direct outdoor access (Fisher, 2005). The examples provided demonstrate how outdoor learning areas can be purposefully constructed if natural spaces cannot be located or utilised.

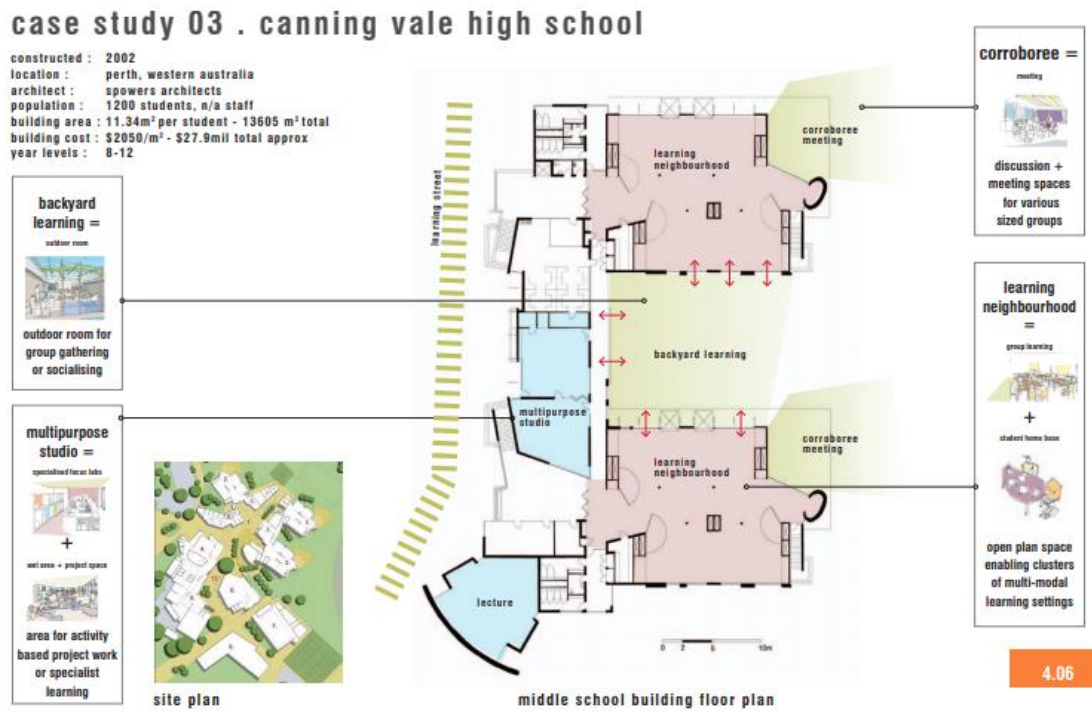


Figure 6: Canning Vale Highschool utilising outdoor learning environments in design source: (Fisher, 2005)

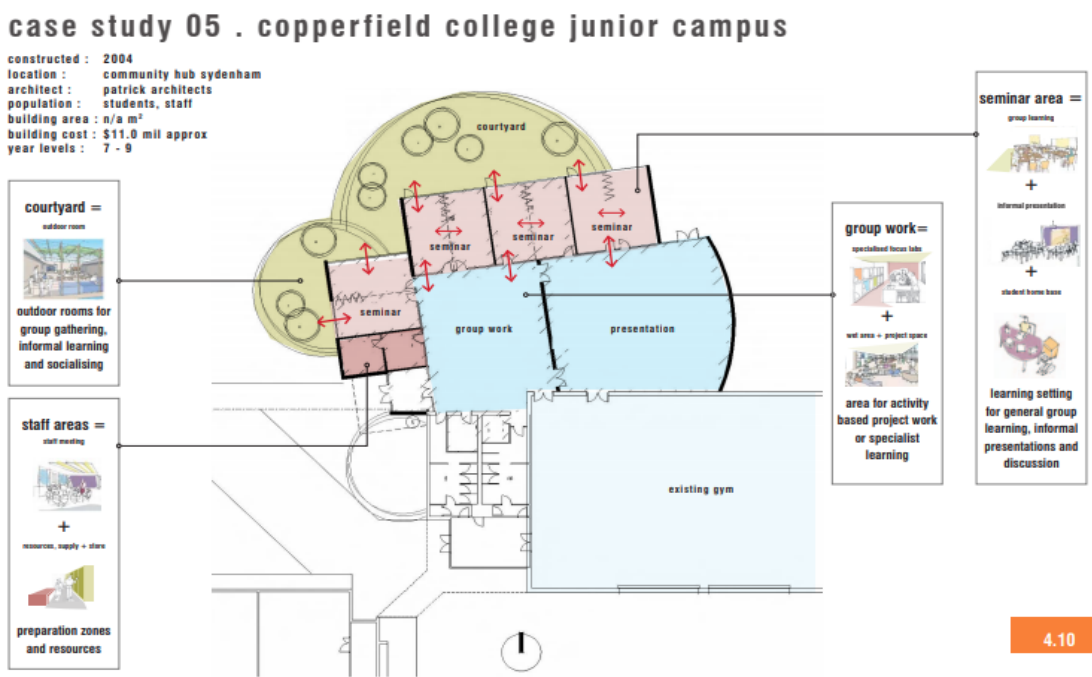


Figure 7: Copperfield College Junior Campus utilising outdoor learning environments in design source: (Fisher, 2005)

## case study 01 . australian maths + science school

constructed : completed 2003  
 location : bedford park, flinders university  
 architect : woods bagot architects  
 population : 450 students, staff n/a  
 building area : 18.4m<sup>2</sup> per student - 8300 m<sup>2</sup> total  
 building cost : \$1686/m<sup>2</sup> - \$14.0mil total project cost  
 year levels : 10, 11, 12

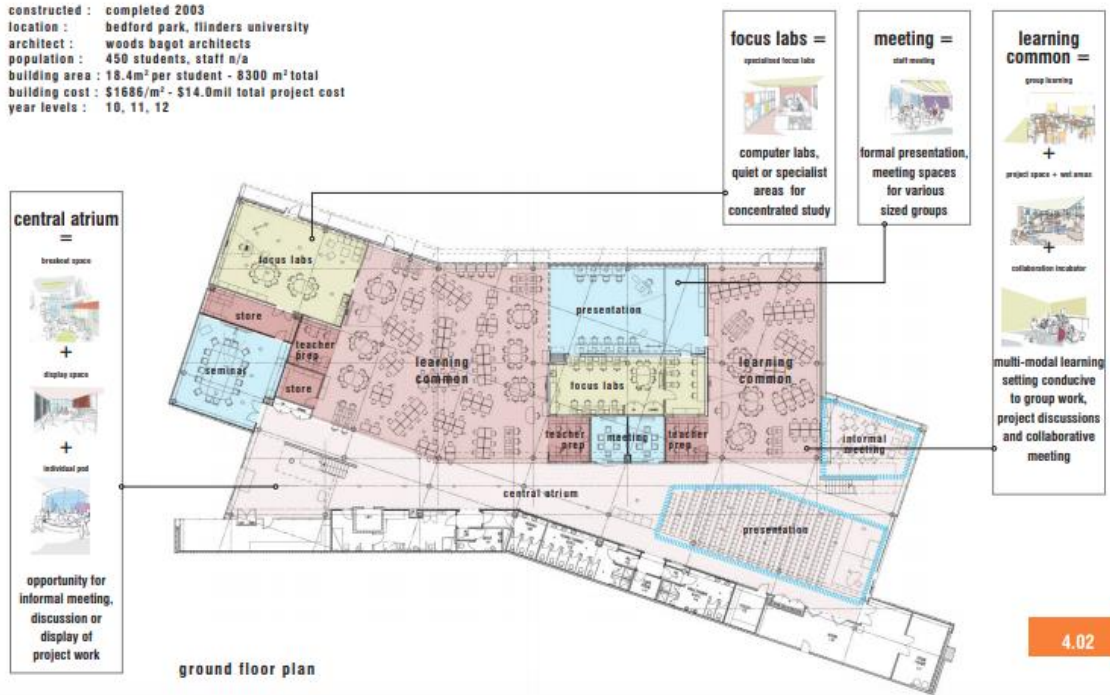


Figure 8: Australian Maths and Science School, outdoor access from every classroom source: (Fisher, 2005)

### *Lack of school administration support and lack of pedagogical freedom*

The last two subthemes intertwine with one another: *Lack of school administration support and Lack of pedagogical freedom*. These two constraints also underpin teachers' lack of confidence and capability in utilising outdoor learning spaces along with time restraints (Carrier et al., 2013; Rickinson et al., 2004). Studies from Dymont (2008) and Ruiz-Gallardo et al. (2013) state that in contrast, lack of time was a huge motivator for students to use outdoor learning spaces, as they wanted to get the most out of their lessons.

The lack freedom is described in studies by (Carrier et al., 2013; Oblinger, 2006; Owens, 2012; Rickinson et al., 2004). It refers to constraints related to the requirements of the curriculum and the lack of physical resources that may be required to implement the learning. This may include outdoor seating and learning utensils such as clipboards or portable devices and technology. Christie et al. (2016) compared secondary and primary schools and found that secondary schools were harder to convince about the benefits of outdoor learning spaces. This was due to the rigidity of their “*discipline and timetabling structures and curricula requirements*” (Christie et al., 2016, p. 422). In Australian secondary schools, curriculum flexibility and pedagogical freedom should not be a concern or constraint. The Australian Curriculum (ACARA) emphasises the importance of using active, student-centred learning approaches and outdoor learning spaces to engage students in gaining knowledge, understanding and skill development.



The lack of support from school authority and administration as a constraint for utilising outdoor learning spaces is described by (Dyment, 2008; Rickinson et al., 2004). This is supported by the research from Christie et al. (2016), they also suggest the lack of support from authority causes hesitancy in teachers. Hesitancy in using outdoor spaces by teachers and students can also be explained by the dependency on technology (Carrier et al., 2013; Dyment, 2008; Nedovic & Morrissey, 2013; Rafferty, 2012; Rickinson et al., 2004; Wirth & Rosenow, 2012).

Eick (2012) and Rafferty (2012) however, state that strengthening internet provisions may counteract the hesitancy to use outdoor learning spaces. The increased effectiveness of being able to use WIFI and portable technologies outside reduces the dilemma and the issue of technology access. These researchers describe how the boundaries are lessening between technology rich environments and outdoor contexts and draw attention to the importance of learning experiences enabled through outdoor learning spaces as well as those through technology (Rafferty, 2012; Wirth & Rosenow, 2012).

*Children experience the real-world hands on rather than as a virtual world (Wirth & Rosenow, 2012, p. 45)*

### *Summary*

International and Australian literature reviewed will be used in conjunction with the Australian Curriculum and findings in relation to the successful utilisation of outdoor learning spaces, in the discussion section of this dissertation. Challenges and constraints stymying and preventing the use of outdoor learning spaces, similarly revealed through the exploration of literature, will also be used in the discussion to reflect on how outdoor learning spaces can shape learning experiences for students.

### *Limitations*

It is important to acknowledge limitations of the available literature, in addition to limitations of the review. Two obvious and previously mentioned imitations are that there are very few resources focusing on outdoor learning spaces at a secondary level, and that there is limited Australian literature available on outdoor learning spaces. The lack of secondary school and Australian sources reveals a gap in research in relation to the use of outdoor learning spaces to shape student learning. Identifying this gap also provides an opportunity for further research.

Only nine of the articles used in this literature review were from research at a secondary level (Bentsen et al., 2013; Christie et al., 2016; Dillon, 2006; Dyment, 2008; Fagerstam, 2014; Fagerstam & Grotherus, 2018; Gislason, 2009; Ponder & Cox-Peterson, 2010; Ruiz-Gallardo et al., 2013). However, the lack of secondary scholarly research can be attributed to the constraints described in the literature review. The lack of motivation, expertise and constraints of timetables, pedagogical practices, resources and time offers few examples for research purposes. It is, however, possible to apply findings, evidence and theories about the success

and challenges related to the utilisation of outdoor spaces from primary and tertiary studies, to secondary contexts.

The lack of Australian research is conspicuous in this literature review. This is not only at a secondary level, but at all schooling stages. Only five sources were about Australian schools, two of which were at a tertiary level (Preston, 2014; Rafferty, 2012), one was at upper primary level (Cumming & Nash, 2015), and three were at mixed level with no focus on specific grades, (Fisher, 2005; Malone, 2004, 2008). It is acknowledged that there is more Australian literature available. These sources have a focus on lower primary and early childhood education and owing to the lack of relevance of the stage of schooling for this study, was not included in the literature review. Although it is unclear why there is a lack of Australian literature, it could be suggested that schools and teachers are disinterested in the approach, do not know how to implement it effectively or they do not understand the benefits for learners and learning. Alternatively, it is possible that schools are currently using outdoor learning spaces but there is no research published.

To provide relevant information, the literature reviewed should ideally be not older than ten years. However, some older research, often cited in more recent literature, was referenced and used in the literature review. This older research was deemed credible and used to support arguments being made in more current literature (Dillon, 2006; Dymont, 2008; Fisher, 2005; Malone, 2004, 2008; Palmberg & Kuru, 2000; Rickinson et al., 2004), or for original definitions of ideas (Gore & Ladwig, 2003; Kellert, 2005; White, 2001; Wilson, 1984). The use of older literature could be seen as a limitation and therefore is important to acknowledge.

Finally, an additional and lesser limitation of the sources reviewed in this section is that all case studies used a small sample of one school or university. There were no relevant studies which used a large sample range. It is possible that if the sample size was larger, the findings may have changed.

## **Methodology and Method**

### *Methodology*

A qualitative research methodology was chosen for this study as the research conditions, including time constraints and ethics and exclude the possibility of gathering and quantifying primary data for a quantitative approach. The nature of this study, which explores human experience and generates meaning from this exploration, also aligns to the underpinning principles of a qualitative methodology. These qualitative research principles involve emerging questions, data collection from the participants' settings, data analysis and the use of inductive reasoning and making "*interpretations of the meaning of the data*" (Creswell & Creswell, 2018, p. 4)

A qualitative research methodology acknowledges the importance of the complexity of situations and the significance of the experiences of participants as being key to making

meaning in research (Creswell & Creswell, 2018). In this study, the qualitative research methodology acknowledges the complexity and diversity of educational settings used for gathering data from literature sources. Also acknowledged is the relevance of the experiences of participants in literature studies in relation to making meaning of the influence of the use of outdoor learning spaces on learning.

As primary sources could not be used for this study, a narrative literature review was used as a qualitative research design. According to Baumeister and Leary (1997)

*...published literature provides a database from which the author draws conclusions about the merits of existing conceptualizations* (p. 312)

A narrative literature review,

*surveys the state of knowledge on a particular topic. Such reviews may provide useful overviews and integrations of an area ... These reviews can be valuable as a means of pulling together what is known about a particular phenomenon, such as for a grant proposal, or as a resource to teachers* (Baumeister & Leary, 1997, p. 312)

As the narrative literature review was used as a qualitative methodology, a constructivist approach, was used to pose broad, and open-ended questions, while exploring the views and experiences of the subjects being studied in literature sources (Creswell & Creswell, 2018). Inductive reasoning was used throughout the narrative literature review to gather information from the literature. Also following an inductive approach, broad patterns and themes were identified within the literature and more questions were asked to support meaning-making.

Following the criteria of a narrative literature review, a diverse range of literature was sourced and reviewed and then mapped to identify patterns and general and specific themes (Creswell & Creswell, 2018). As Baumeister and Leary (1997) state, the two most important things in a narrative literature review are ensuring that the literature has been “*covered accurately and thoroughly*” and presenting “*each study in a way that makes its relation to the integrative themes clear and explicit*” (p. 312). In this study, literature that represented students’ use of outdoor learning spaces and their experiences and feelings in response to that use, was specifically chosen. Likewise, there was an emphasis on literature that focussed on student interaction in outdoor learning spaces and literature that focussed on the influence of outdoor learning spaces on disengaged students. Less focus was placed on literature that reported on test scores and other formal learning progress definers.

### *Method*

A comprehensive narrative literature review was used to integrate the findings of primary literature. Individual sources were reviewed thoroughly, then compared and integrated with other sources. This exposed differences and similarities and enabled themes in relation to the use of outdoor learning spaces, to be identified. After familiarisation with the literature, the sources were organised into a table (Table 2). This assisted the identification of key themes

and subthemes. Many overlapping and intertwining themes were identified in response to the diverse findings in the literature. The integration of literature and identification of themes assisted analysis and evaluation. In addition, advantages and disadvantages in relation to the use of outdoor learning spaces were identified through the literature review. Limitations and gaps in research were acknowledged along with future research recommendations. These will be discussed later in this dissertation along with Australian curriculum links.

### *Literature review search strategy*

Choosing relevant sources was essential for this study as a way to gather information about what is already known about the use of outdoor learning spaces. The literature systematically selected was then used in the methodology to reveal new insights about these outdoor learning spaces. The following six steps identified by Creswell and Creswell (2018) were used to find and select literature in a systematic and organised way.

1. Identify keywords
2. Search databases
3. Locate initial articles
4. Identify useful literature
5. Draft summaries of literature
6. Assemble the literature review

Identifying key words and phrases that related directly to the topic being investigated was important. It was at this stage that exclusions were decided. Outdoor education was the initial search phrase for the research, however, after reviewing articles associated with this key phrase, it was decided that *outdoor education* should be excluded from the search criteria. The reasoning behind this decision was that *outdoor education* predominately resulted in sourcing literature that focussed on outdoor adventure education, physical education and camps. Accordingly, the search phrase was changed to *outdoor learning spaces*. This key phrase significantly discerned and removed irrelevant literature from the search and resulted in the location of relevant and credible literature for the literature review and study. *Garden learning* was an additional key search which was successful in locating other relevant key literature sources.

Database searches were used to find relevant books and peer-reviewed journal articles. These included A+ Education, ERIC, the Adelaide University Library search engine, and GOOGLE Scholar. Additionally, GOOGLE was used to search for curriculum and government webpages to support the discussion. After reading numerous abstracts, approximately 35 readings were selected as being most relevant. Additional sources were identified from citations and references within the selected readings.

Many readings were discarded due to the lack of relevant or useful information. For example, articles were discarded that only mentioned outdoor learning spaces in relation to learning about the environment from an indoor classroom, and that focussed on the importance of a

view of the outdoors from an indoor classroom. Also excluded were numerous studies related to kindergarten and early primary school education as these studies had few connections to, and implications for, secondary education.

### *Integrating literature and creating themes for analysis*

To integrate literature for the review, comprehensive organisation, analysis and evaluation of the literature was undertaken. This involved tabling the literature and quantifying common themes and arguments (Table 1). The methodologies involved in each study were also analysed. The method of compiling literature into a table facilitated the comparison, analysis and evaluation of sources and enabled the most credible, well-rounded and relevant sources and themes to be identified.

## **Findings**

In line with a narrative literature review research methodology, the findings are first represented as a table of themes drawn from a systematic exploration of literature (Table 1). These findings have been synthesised and analysed to shed light on the current use of outdoor learning spaces that shape student learning experiences in Australian secondary schools. These findings also provide key insight into the possible benefits and constraints of outdoor learning spaces for secondary students.

*Table 1: Themes identified from literature*

<b>Theme</b>	<b>Sub-theme</b>	<b>Indexing</b>
<i>Human-nature relationships</i>	Enhanced environmental understanding	<ul style="list-style-type: none"> <li>• Biophilia (Kellert, 2005; White, 2001; Wilson, 1984)</li> <li>• Pro-environmental attitudes (Gislason, 2009; Malone, 2004, 2008; Palmberg &amp; Kuru, 2000)</li> <li>• Sense of belonging, (Cumming &amp; Nash, 2015; Malone, 2004)</li> <li>• Connection between people and place (Bloom et al., 2010; Christie et al., 2016; Cumming &amp; Nash, 2015; Harris, 2017; Malone, 2008)</li> </ul>
	Action based/ placed pedagogy	<ul style="list-style-type: none"> <li>• Environmental Activism (Barthel et al., 2018; Bentsen et al., 2013; Bloom et al., 2010; Gislason, 2009; Ponder &amp; Cox-Peterson, 2010)</li> <li>• Eco-strategy (Bentsen et al., 2013; Malone, 2004; Ponder &amp; Cox-Peterson, 2010)</li> </ul>

<i>Freedom from Constraints</i>	Independence / student-centred learning	<ul style="list-style-type: none"> <li>• Students making learning decisions (Christie et al., 2016; Eick, 2012; Rafferty, 2012)</li> <li>• Learning from each other (Fagerstam &amp; Grotherus, 2018)</li> </ul>
	Teacher - student relations	<ul style="list-style-type: none"> <li>• Positive student – teacher relationships (Fagerstam, 2014; Ruiz-Gallardo et al., 2013)</li> <li>• Increased mobility in helping students (Fagerstam, 2014)</li> </ul>
<i>Health and Wellbeing</i>	Emotional wellbeing	<ul style="list-style-type: none"> <li>• Positive emotions (Dillon, 2006; Fagerstam, 2014; Malone, 2008; Palmberg &amp; Kuru, 2000; Ruiz-Gallardo et al., 2013)</li> <li>• Focus (Fagerstam &amp; Grotherus, 2018)</li> <li>• Enhanced self-esteem and confidence (Malone, 2008; Palmberg &amp; Kuru, 2000; Ruiz-Gallardo et al., 2013)</li> </ul>
	Physical wellbeing	<ul style="list-style-type: none"> <li>• Positive physical impacts (Department of Education, 2018; Dillon, 2006; Malone, 2004, 2008; Rafferty, 2012)</li> <li>• Students with physical disabilities (Eick, 2012; Malone, 2008)</li> <li>• Reduction in sick days (Galizio et al., 2009)</li> </ul>
	Wellbeing for people with learning disabilities	<ul style="list-style-type: none"> <li>• Attention deficit disorder (Harris, 2017; Malone, 2008; Owens, 2012; Wirth &amp; Rosenow, 2012)</li> </ul>
<i>Stimulation and Engagement</i>	Motivation	<ul style="list-style-type: none"> <li>• Increased motivation (Dyment, 2008; Eick, 2012; Fagerstam, 2014; Harris, 2017)</li> <li>• Hands on experiences increasing motivation (Department of Education, 2018; Eick, 2012; Galizio et al., 2009; Harris, 2017; Montgomery &amp; Millenbah, 2011; Preston, 2014)</li> </ul>
	Participation	<ul style="list-style-type: none"> <li>• Escalated participation (Christie et al., 2016; Fagerstam, 2014; Fagerstam &amp; Grotherus, 2018; Galizio et al., 2009; Gislason, 2009; Harris, 2017; Malone, 2008; Rafferty, 2012; Ruiz-Gallardo et al., 2013)</li> </ul>

		<ul style="list-style-type: none"> <li>• Increased participation for shy students (Fagerstam, 2014; Ruiz-Gallardo et al., 2013)</li> <li>• Boundaries reduced between high and low achieving students (Fagerstam, 2014)</li> </ul>
	Disengaged students/ students with behavioural issues	<ul style="list-style-type: none"> <li>• Overall increased perception of school from usually disengaged, troublesome students (Ruiz-Gallardo et al., 2013)</li> </ul>
<i>Skills and Knowledge</i>	Academic skills and knowledge	<ul style="list-style-type: none"> <li>• Cognitive impact (Dillon, 2006; Eick, 2012; Harris, 2017; Montgomery &amp; Millenbah, 2011; Rafferty, 2012)</li> </ul>
	Critical thinking and inquiry	<ul style="list-style-type: none"> <li>• Cultivating critical thinking (Christie et al., 2016)</li> <li>• Decision making and problem solving abilities (Malone, 2008)</li> <li>• Observational and analytic skills in a field setting (Gislason, 2009)</li> </ul>
	Social skills	<ul style="list-style-type: none"> <li>• Growth of social skills (Fagerstam, 2014; Fagerstam &amp; Grotherus, 2018)</li> <li>• Community engagement (Fagerstam, 2014; Malone, 2004)</li> <li>• Better student interaction and inclusivity (Fagerstam, 2014; Malone, 2004; Ruiz-Gallardo et al., 2013)</li> </ul>
	Practical skills	<ul style="list-style-type: none"> <li>• Real life application of curriculum (Fagerstam, 2014; Fagerstam &amp; Grotherus, 2018)</li> <li>• Practical skills for disengaged learners (Fagerstam, 2014; Ruiz-Gallardo et al., 2013)</li> </ul>
<i>Fear and Concern</i>	Fear of nature	<ul style="list-style-type: none"> <li>• Biophobia (Carrier et al., 2013; Kellert, 2005; Nedovic &amp; Morrissey, 2013; White, 2001; Wilson, 1984)</li> </ul> <p>Health and safety (Carrier et al., 2013; Dymont, 2008; Galizio et al., 2009; Harris, 2017; Nedovic &amp; Morrissey, 2013; Rickinson et al., 2004)</p>

<i>Lack of confidence and expertise</i>		<ul style="list-style-type: none"> <li>• Lack of confidence using outdoor spaces (Carrier et al., 2013)</li> <li>• Lack of confidence using inquiry based pedagogies (Carrier et al., 2013; Dymont, 2008)</li> </ul>
<i>Lack of Resources</i>	Lack of natural spaces	<ul style="list-style-type: none"> <li>• The urbanization of the world – lack of green space (Dymont, 2008; Galizio et al., 2009; Malone, 2004; Nedovic &amp; Morrissey, 2013; Wirth &amp; Rosenow, 2012).</li> <li>•</li> </ul>
	Lack of school administration support	<ul style="list-style-type: none"> <li>• Lack of support from authority (Christie et al., 2016; Dymont, 2008; Rickinson et al., 2004)</li> <li>• Dependency on technology (Carrier et al., 2013; Dymont, 2008; Nedovic &amp; Morrissey, 2013; Rafferty, 2012; Rickinson et al., 2004; Wirth &amp; Rosenow, 2012)</li> </ul>
	Lack of pedagogical freedom	<ul style="list-style-type: none"> <li>• The requirements of school curriculum and lack of physical resources (Carrier et al., 2013; Oblinger, 2006; Owens, 2012; Rickinson et al., 2004)</li> </ul>

## **Analysis and synthesis of findings**

Increased understanding and insight in relation to guiding research questions are supported through an analysis and synthesis of these themes as findings. Findings will also be drawn from the analysis of Australian Curriculum and state and territory senior secondary curriculums in relation to direct recommendations for the use of outdoor learning spaces.

### *Human nature relationships*

Building relationship with nature through the use of outdoor learning spaces can benefit students' learning experiences by developing Biophilia - their connection with nature, and by reducing Biophobia - a fear of nature (Kellert, 2005; Nedovic & Morrissey, 2013; White, 2001; Wilson, 1984) . The findings from the literature suggest that enhancing a positive human nature relationship could help to overcome negative feelings that some students exhibit in relation to school contexts (Kellert, 2005; Nedovic & Morrissey, 2013; White, 2001; Wilson, 1984) . Building human nature relationships also encourages environmental sustainability through the development of connection with nature and pro-environmental beliefs (Gislason, 2009; Malone, 2004, 2008; Palmberg & Kuru, 2000). It provides a sense of belonging to the students



through the establishment of deep connections to land (Bloom et al., 2010; Christie et al., 2016; Cumming & Nash, 2015; Harris, 2017; Malone, 2004, 2008).

### *Freedom from constraints*

Developing, and providing opportunity for independence is recognised as an essential characteristic of middle/secondary and adolescent education (Pendergast & Main, 2017). According to literature, outdoor learning spaces foster student independence. This is largely attributed to the use of inquiry learning as a feature of using outdoor learning spaces (Christie et al., 2016; Eick, 2012; Fagerstam & Grotherus, 2018; Rafferty, 2012)

Findings from literature also indicate that lack of teacher confidence in using an inquiry pedagogy, environment and using outdoor learning spaces, can negatively impact on student learning experiences (Carrier et al., 2013; Dymont, 2008). In the literature, it was noted that students reciprocated negative feelings about learning in outdoor learning spaces when the teacher made it obvious that he/she disliked outdoor learning spaces (Carrier et al., 2013). The literature identifies that teachers' dependency on technology also contributes to lack of confidence in using outdoor learning spaces. However, wireless internet and devices can be used to combat this (Carrier et al., 2013; Dymont, 2008; Nedovic & Morrissey, 2013; Rafferty, 2012; Rickinson et al., 2004; Wirth & Rosenow, 2012).

In contrast, findings also indicate that positive student and teacher relationships can be developed and fostered through the use of outdoor learning spaces for learning. Specifically, students were more confident in asking for support and assistance with their learning in outdoor settings in comparison to traditional learning environment settings (Fagerstam, 2014; Ruiz-Gallardo et al., 2013).

Also revealed is that some teachers do not feel they are supported to use outdoor learning spaces by school administration and leadership (Christie et al., 2016; Dymont, 2008; Rickinson et al., 2004). This finding hopefully provides a key message to school leaders in relation to the need for professional learning in relation to using outdoor spaces and pedagogical approaches for working in these spaces in secondary contexts.

### *Health and wellbeing*

Findings drawn through research show that students' moods changed in outdoor learning spaces. This included an increase in students' self-esteem and confidence and an enhancement in their positive emotions towards learning and their peers. These findings are significant in relation to responding to the emotional and physical well-being needs of adolescent students in secondary contexts (Dillon, 2006; Fagerstam, 2014; Fagerstam & Grotherus, 2018; Malone, 2008; Palmberg & Kuru, 2000; Ruiz-Gallardo et al., 2013)

The physical wellbeing benefits provided by outdoor learning spaces are extensive and go beyond the scope of this research which focuses on learning experiences in schools. Therefore,

for the purpose of this research the findings analysed were only those relating to the students' learning experiences. Health benefits were not analysed.

Research results revealed that students appear to have improved physical fitness and development as a result of engaging in outdoor learning spaces. Similarly, positive results were identified in relation to the impact of using outdoor learning spaces on students with learning disabilities. Literature repeatedly mentioned that students with learning disabilities, especially those with attention deficit disorders, thrived in outdoor learning spaces (Harris, 2017; Malone, 2008; Owens, 2012; Wirth & Rosenow, 2012). Lack of confinement compared to that of traditional learning environments and the use of tactile and kinaesthetic pedagogies are referenced as being key reasons for this positive relationship.

### *Stimulation and engagement*

Substantial evidence was provided in this literature that demonstrated that outdoor learning spaces supported increased student incentive and engagement in their learning (Dyment, 2008; Eick, 2012; Fagerstam, 2014; Harris, 2017). The practical and hands-on nature of outdoor learning environments saw a rise in motivation from the students towards their learning (Department of Education, 2018; Eick, 2012; Galizio et al., 2009; Harris, 2017; Montgomery & Millenbah, 2011; Preston, 2014).

Findings also show that student participation increased through the use of outdoor learning environments, especially amongst typically shy and reserved students (Fagerstam, 2014; Ruiz-Gallardo et al., 2013). Again, this finding was attributed to the informal nature of outdoor environments and its impact on reducing perceived classroom pressure. This finding is highly significant as it was mentioned frequently in literature. It indicates that the use of outdoor learning spaces can reduce the inequity provided by learning environments for students who are outspoken or shy; academically excellent or academically challenged; and engaged or disengaged (Fagerstam, 2014; Ruiz-Gallardo et al., 2013).

Literature also revealed that students who are disengaged or have behavioural issues benefitted from the use of outdoor spaces (Ruiz-Gallardo et al., 2013). This finding (Figure 5) shows that participation increased, and the success rate of these students significantly increased through the use of outdoor learning spaces.

### *Skills and knowledge*

An insight drawn from the review of literature indicates that the impact of outdoor learning spaces on increasing positive cognitive development, was significant (Dillon, 2006; Eick, 2012; Harris, 2017; Montgomery & Millenbah, 2011; Rafferty, 2012). Although reasons for the increase in cognitive development varied in different literature sources, a common reason across sources was the conditions afforded by the use of outdoor environments for learning. These conditions included a less pressured and more relaxed environment which boosted student confidence and therefore learning engagement and success. In the literature (Christie et al., 2016; Gislason, 2009; Malone, 2008), enhanced cognitive abilities were described as

being reflected in the students' effective use of higher-level critical thinking and inquiry skills. This success was also associated with the use of student-centred and inquiry-based learning in outdoor settings and was further enhanced by the curiosity and hands-on learning generated from these engagements.

Findings within this theme also overlap with those in the theme of Stimulation and Engagement. Specifically, skills and knowledge were seen to improve in all students regardless of their diverse capabilities and learning needs. As a consequence of the more relaxed environment afforded by outdoor learning spaces, inclusive behaviours improved, and collaborative student interactions increased (Fagerstam, 2014; Malone, 2004; Ruiz-Gallardo et al., 2013).

In addition, findings also indicate that using outdoor learning spaces for learning improved social skills between students; between students and teachers; and also, between members of the outside community (Fagerstam, 2014; Fagerstam & Grotherus, 2018; Malone, 2004). Social skills are critical to students' positive experiences at school and beyond. They underpin the life skills, and practical which students need to become functional members of society (Fagerstam, 2014; Fagerstam & Grotherus, 2018).

Students' skills were further developed through the use of community gardens and parks as outdoor learning spaces. Students also developed respect for shared spaces and their social skills improved through interactions with community members (Fagerstam, 2014; Malone, 2004). It may be suggested that the utilisation of public spaces provides a solution for constraints associated with lack of natural spaces and lack of confidence using outdoor learning spaces. The use of under-utilised community gardens and public natural areas as outdoor learning spaces would provide teachers with an opportunity to build their expertise and confidence in relation to working in this environment. It also supports students and teachers to apply curriculum knowledge to real contexts.

## **Discussion**

The following discussion critically examines the information sourced through the analysis of themes and Australian curriculum documents. Also used are insights drawn from the study to better understand the potential of outdoor learning spaces in positively shaping student learning experiences in middle and secondary school. Using the initial research questions to frame the discussion, insights will also be used to describe what has been discovered through the exploration of literature and to propose possible ways forward with future research. Where appropriate, some guiding questions have been grouped together for a collective response and discussion.

### *The current use of outdoor learning spaces in secondary schools in Australia*

As the findings have revealed there is little research available on the use of outdoor learning spaces in Australian secondary schools. In fact, only one significant source (Fisher, 2005) could be located that provides insight into secondary schools' use of outdoor learning spaces. This source describes the effective design of secondary schools that incorporates safe and secure outdoor learning spaces in the physical plan of the school and actively promotes the use of appropriate and effective pedagogies. Beyond this one source, it is difficult to provide a specific response to how outdoor learning spaces are being used in secondary contexts, other than assuming that most outdoor spaces are used for general activities or outdoor / physical education. This assumption is based on the analysis of secondary curriculum documents which primarily focus on outdoor spaces in relation to outdoor education. Little or no mention is made of the use of these spaces in other learning areas.

It is also challenging to identify whether the lack of research is due to lack of use of outdoor learning spaces, or if the spaces are being utilised and just not reported upon. However, based on the substantial documentation for the use of outdoor learning spaces for the early years and primary schooling it seems likely that research and documentation would be available if outdoor learning spaces were being utilised in secondary schools.

To gain an accurate image of what is happening in secondary schools and therefore have a greater research source, further study and exploration is required. Suggested questions underpinning this research could be:

- Are secondary schools utilising outdoor learning spaces but not promoting it?
- Are schools not enabling students to learn in outdoor learning spaces at all?
- If outdoor learning spaces are not being used, then why?

Also important in future research would be gathering observations and responses to questions and surveys from a wide range of stakeholders including teachers, school leadership, administration and especially students. Gaining perspective from a wide range of stakeholders would provide greater insight into how outdoor learning spaces are currently being used, or not being used for learning.

### *Australian Curriculum support for the use of outdoor learning spaces in secondary schools*

After a thorough review and analysis of the *Australian curriculum* and individual senior secondary curriculums of the states and territories, little evidence was found that clearly articulates support for outdoor learning spaces in secondary schools beyond outdoor education and physical education.

The inclusion of outdoor education in the curriculum is acknowledged as a positive step forward, and it is important to be clear that this study does not dispute the importance of this area of learning. Rather, the content and focus on inclusivity, dispositions and development of physical, emotional and social skills in this area of learning is commendable and aligns directly with the focus of this research and its broader use of outdoor spaces. The concern identified through this study, is that the focus on the use of outdoor spaces is limited to this one area of learning and not recognised as being beneficial for positively shaping student learning across learning areas.

Another similar concern identified through the analysis of curriculum documents is that the use of outdoor spaces in years seven to ten, is only incorporated as part of the Health and Physical Education curriculum. Once again, this limits the potential use of outdoor spaces. Also of concern are the inconsistencies across states and territories in relation to outdoor education programs and the mention of outdoor learning opportunities. Neither Queensland nor New South Wales offer an outdoor education course.

In contrast, the national curriculum document, the Australian Curriculum, holds a strong, supportive and purposeful position on outdoor learning spaces. It clearly states the importance of engaging students in outdoor spaces for learning and developing “the skills and understandings to move safely and competently while valuing a positive relationship with natural environments and promoting the sustainable use of these environments” (ACARA). The related and supporting documents and resources available through the Australian Curriculum website are also of high value and support teachers in creating and using outdoor learning spaces effectively. However, as indicated in the findings, the limitations of the Australian Curriculum are that it only provides this information for the primary and pre-school years. It would be desirable to see these resources extended to include the secondary years.

As previously mentioned, one concerning issue of curriculum documents is that visible or practical connections are not made between the use of outdoor learning spaces across all learning areas. Although it is the responsibility of schools and teachers to design learning experiences, it would be constructive for curriculum documents to provide exemplars and suggestions for the purposeful use of outdoor spaces across all learning areas. Currently, there is only very brief mention of the possible use of nature areas in the obvious curriculums: Geography, Earth and Environmental Science and Science.

Table 2 below shows how the use of outdoor learning spaces may be used to enhance and positively shape learning experiences for secondary students. The following examples relate specifically to subject areas. However, it is important to note, that the use of outdoor learning spaces do not have to have specific content connections. The mere change from using traditional classroom setting to sitting on benches or the grass outside in the fresh air (with appropriate sun protection) can significantly improve or transform students’ attitudes, dispositions, engagement, motivation, participation and achievement.

Table 2: Ideas for using outdoor learning space

Maths	English	Art
<p>The students could do an orienteering activity around the school campus when learning about distance and time. Additionally, they could look at the buildings in relation to angles.</p> <p>Possible curriculum links: ACMMG18L, ACMMG159, ACMMG219 (ACARA)</p>	<p>The students could write stories or poems about the natural environment they are in, incorporating feeling and differing perspectives.</p> <p>Possible curriculum links: ACELA1561, ACELA1564, ACELA1567, ACEEE029, ACEEE030, ACEEE031, ACEEE032. (ACARA)</p>	<p>Students use natural resources to create artwork, or use natural objects in their larger artworks, or simply create an artwork inspired by being immersed in nature.</p> <p>Possible curriculum links: ACAVAM118, ACAVAM119, ACAVAM127, ACAVAM128. (Could be linked to any) (ACARA)</p>
Business studies	History	Music
<p>Use pro-environmental beliefs and human nature connection to inspire students to use environmental sustainability in business projects.</p> <p>Possible curriculum links: ACHEK031, ACHEK017 (ACARA)</p>	<p>Students learn about the history of the school grounds and surrounding areas. This could authentically incorporate Indigenous histories.</p> <p>Possible curriculum links: ACHMH098, ACHMH047, ACHMH002. (ACARA)</p>	<p>Students use inspiration from natural sounds to compose music</p> <p>Possible curriculum links: ACAMUM093, ACAMUM099, ACAMUM102 (ACARA)</p>
Legal studies	Foreign Languages	Food technology
<p>Environmental law is included in many of the secondary school certificates in Australia. Teaching this topic in an outdoor learning space would support connections to and understanding of pro-environmental beliefs.</p> <p>Possible curriculum links: Global Environmental Protection unit - this varies amongst states but is included in all programs.</p>	<p>Students build vocabulary by drawing on what they see in the natural environments and engaging in free conversation.</p> <p>Possible curriculum links: ACLFRC094, ACLFRC091. (ACARA)</p>	<p>Utilise school / community fruit vegetable and herb gardens to create meals.</p> <p>Possible curriculum links: ACTDEK045 (ACARA)</p>

The aim of these examples drawn from the secondary stage of schooling, is to demonstrate the effective use of outdoor learning spaces across learning areas. In these examples the outside environment could increase student engagement and enhance learning potential.

### *The benefits and limitations of outdoor learning spaces*

The benefits and limitations of using outdoor learning spaces have been explored in depth through this study. Major benefits are aligned to creating alternative learning spaces for students to find relief from their sensitivity to the pressures or confinement of traditional classroom settings. Research has been described that depicts the extensive physical and emotional benefits of working in nature (Dillon, 2006; Eick, 2012; Fagerstam, 2014; Fagerstam & Grotherus, 2018; Harris, 2017; Malone, 2004, 2008; Palmberg & Kuru, 2000; Rafferty, 2012; Ruiz-Gallardo et al., 2013; Wirth & Rosenow, 2012). This is particularly significant when considering secondary education and the unique and specific needs of adolescent students (Pendergast & Main, 2017). Also important to reiterate are the significant benefits that outdoor learning has on increasing student motivation, stimulation, engagement and wellbeing (Christie et al., 2016; Dymont, 2008; Eick, 2012; Fagerstam, 2014; Fagerstam & Grotherus, 2018; Galizio et al., 2009; Gislason, 2009; Harris, 2017; Malone, 2008; Rafferty, 2012; Ruiz-Gallardo et al., 2013)

Another benefit of using outdoor spaces for learning is their creative potential for authentic cross curricula work and knowledge integration between subjects that focus on developing deeper understanding and knowledge. An example drawing on ideas described in the above table could be using the environmental protection and legislation focussed upon in legal studies to create environmentally sustainable business proposals in business studies. Another suggestion is an English and music interdisciplinary unit where, as part of their English curriculum, students engage in poetry writing, inspired by nature. They could then continue to draw on this inspiration to create a melody, using the poetry as lyrics. The options are endless and would shape students learning experiences positively.

Yet another benefit of using outdoor learning spaces is the opportunity it provides to embed unique pedagogies that support students in their adolescent stage of life (Pendergast & Main, 2017). In addition to experiencing changes involved in moving from a primary to secondary school environment, teenage students also experience many personal changes: psychologically, socially, emotionally, cognitively, and morally (Pendergast & Main, 2017).

Inquiry, hands-on and collaborative pedagogies best support adolescent learning and are also most effective in outdoor learning spaces (Christie et al., 2016; Eick, 2012; Fagerstam, 2014; Fagerstam & Grotherus, 2018; Rafferty, 2012; Ruiz-Gallardo et al., 2013) . According to Pendergast and Main (2017) the best pedagogies for teenage and adolescent students are “*highly engaging, hands-on, kinaesthetic, flexible, relevant and creative*” (p. 74). In addition, adolescent pedagogies should include a range of quiet solo work time and small group work.

These pedagogies all function successfully in outdoor learning spaces (Pendergast & Main, 2017) and were explored in the class examples in Table 2.

Table two provides an overview of the benefits derived from the results of the literature review. Collectively, the benefits of using outdoor learning spaces to shape student learning can be summarised as: encouraging positive human-nature relationships, providing students with the opportunity to create and value environmental connections, an alternative and enhanced mode for developing specific knowledge and skills and significant in increasing participation and engagement and the promotion of positive health and wellbeing. It also provides an authentic context for adolescent, student-centred, inquiry-based and interdisciplinary learning. Additionally, building positive human nature relationships may build pro-environmental beliefs and awaken a passion for sustainability - encouraging activism through action-based teaching pedagogies (Ponder & Cox-Peterson, 2010).

Limitations in using outdoor learning spaces have also been described throughout the study. Interestingly, these limitations mainly involve teachers rather than students as they include lack of confidence in, and understanding of the potential for using outdoor spaces for learning, lack of experience with appropriate pedagogies, concern about student behaviour, lack of learning, and Biophobia (Carrier et al., 2013; Dymont, 2008; Galizio et al., 2009; Harris, 2017; Kellert, 2005; Nedovic & Morrissey, 2013; Oblinger, 2006; Owens, 2012; Rickinson et al., 2004; White, 2001; Wilson, 1984; Wirth & Rosenow, 2012) . Without doubt some students may also hesitate to engage in outdoor learning spaces due to Biophobia. Exposure to extreme weather conditions can also pose limitations on the use of outdoor spaces (Carrier et al., 2013; Dymont, 2008; Galizio et al., 2009; Harris, 2017; Nedovic & Morrissey, 2013; Rickinson et al., 2004).

### *Improving the use of outdoor learning spaces*

The limitations described above draw attention to the needs of teachers in relation to the use of outdoor learning spaces. The lack of teachers' confidence identified through the review of literature and lack of understanding of appropriate pedagogies (Carrier et al., 2013; Dymont, 2008), could be vastly improved if there was appropriate and effective professional development. The literature brought to light that teachers who did not want to use outdoor learning spaces or did not want to regularly use them arose from their unfamiliarity and discomfort with nature. Professional development would significantly reduce these negative feelings and be reflected in a shift in practices.

A search of data bases revealed an excellent range of teacher professional learning focussed on the use of outdoor spaces for learning at a primary and kindergarten level. Courses offered appear to be beneficial for student learning and teacher's pedagogical growth. Many of the courses are offered by Nature Play branches across Australia. Additionally, Nature Play South Australia (SA) offers a course for Out of School Hours Care educators so that outdoor learning spaces can be incorporated in, before, and after the school day experiences. These efforts by Nature Play SA are outstanding but could be improved by extending services to cater for secondary teachers.



The need for professional learning to effectively and efficiently build teachers' capabilities in using outdoor learning spaces at a secondary level is significant and should be a focus for future research, investigation and development. It is possible that professional development for secondary schools could be adjusted from the courses already offered for primary teachers. Figure 9 below, shows a workshop offered by Nature Play SA, and is an example of professional development that could be modified for secondary teachers.

THE WITTUNGA SESSIONS #3

### Outdoor Learning in a South Australian Context

This session is aimed at primary educators and will offer a practical examination of how outdoor learning environments can be used to deliver Australian Curriculum content.

The workshop will connect outdoor learning with all three domains of the Curriculum. We will reflect on the ACARA Outdoor Learning Connection Resource, which provides a framework for students to experience guided, integrated learning across the curriculum in natural environments. Educators will develop an understanding of this document and how it can add value to programming, practise and documentation.

This practical workshop will give educators an opportunity to:

- Discover new ways to facilitate and deliver content of the Australian Curriculum in an outdoor learning environment
- Participate and engage in curriculum connected outdoor classroom sessions
- Work with NPSA staff and participants to recognise and plan for experiences that connect General Capabilities to outdoor learning experiences

Figure 9: Curriculum connection workshop offered by Nature Play SA. (Nature Play SA, 2019)

This professional learning workshop would be valuable for secondary teachers. Learning how to use outdoor learning spaces to best teach the curriculum could build teacher confidence and therefore promote its use. Figure 9, shows an example of professional learning that is very easily transferable from primary level to secondary level. One possible approach would be to split the workshop into middle school (Year 7 to 10) and senior secondary (Year 11 and 12) levels. In doing so, the workshop could then focus specifically on stages of learning and curriculum content.

Furthermore, improvement can be made in the area of curriculum. The analysis of the Australian Curriculum and state and territory senior secondary curriculum in the beginning on this research, identifies the lack of emphasis of the use of outdoor learning spaces. The use of outdoor learning spaces could be improved significantly with support from national, state and territory curriculums. If the use of outdoor learning spaces is reflected in curriculum documents, then implementation will occur in schools across Australia.

## *The potential for further utilisation of outdoor learning spaces*

*The findings point to the untapped potential of these spaces to be used as sites for outdoor learning... Given the reported additional benefits to using a school ground as an outdoor classroom, it seems a profound loss to have them remain underused. I suspect the long-term consequences of not addressing them may be even more damaging (Dyment, 2008, pp. 40, 42).*

Results and findings from the literature review and background of the Australian Curriculum documents indicate that there is a substantial gap in the use of outdoor spaces for learning across learning areas in Australian secondary schools. Therefore, the potential to increase the use of outdoor learning spaces in Australian secondary schools is immense but also requires more investigation, the building of resources, and the development of teacher professional learning to support teacher confidence and capability in using these spaces.

Another essential change that needs to occur is the modification of curriculum documents to reflect the importance of using outdoor spaces. It is recommended that engaging students in outdoor spaces as an approach to connect students in deep learning experiences in all learning areas and across primary and secondary stages of schooling, is mentioned clearly in the Australian Curriculum, in content descriptors, elaborations and supporting resources. It is hoped that this clear documentation of the use of outdoor spaces would then be reflected in specific state and territory documents. In addition to creating opportunity for effective professional learning for secondary teachers, this would be an important way to add impetus to this change.

The potential for using outdoor learning spaces is vast and with increased resourcing, experience and teacher confidence could improve adolescent student engagement and experiences in schooling. In addition, increased use of outdoor learning spaces could promote environmental consciousness and sustainability and pro-environmental beliefs, and lead to a future of environmentally focused members of the Australian community.

## **Further research**

The purpose of this study is to explore how outdoor learning spaces are utilised in secondary schools in Australia, to better understand the influence of these learning spaces on student learning experiences. This study only provides a first step in filling a fairly significant gap in research. Therefore, continued research will be required. A specific focus on considering effective pedagogies where outdoor learning spaces can be utilised to enhance learning aligned to Australian Curriculum Achievement Standards and Content Descriptors could be a direction for further research.

Studies with the capacity to conduct primary research, including observations, survey and implementation of programs would be highly beneficial. Perhaps further research into Canning Vale High School (Figure 6), Copperfield College Junior Campus (Figure 7) and the Australian

Maths and Science School (Figure 8), would be a good place to begin initial research, as they have already been identified for their school designs. This primary research would be interesting from views of both teachers and students, in order to get well rounded and all-inclusive research. This research provides evidence from studies on lower schooling levels and from international sources, although this research provides basis for change, providing authority figures with data and evidence from primary research conducted in secondary schools in Australia, would provide people who have the ability to make this change with evidence which is hard to ignore.

## **Conclusion**

A thorough exploration, analysis and evaluation of current literature and curriculum documents, has provided insight into how the use of outdoor learning spaces has shaped and influenced student learning experiences. Due to the lack of literature from secondary contexts, these insights are projections based on research about effective adolescent pedagogies, and through literature reviewed in this study, focus on the findings of studies in relation to the use of outdoor learning spaces in primary contexts.

In line with a qualitative research approach (Creswell and Creswell, 2018), projections about the possible shaping of student learning in secondary contexts based on both positive and negative experiences of primary students and teachers in similar settings have been explored and presented. The narrative literature methodology provides an appropriate approach to identify patterns and themes in the literature and to explore current research. This approach successfully illuminates current knowledge, understanding and questions in relation to the use of outdoor learning spaces and highlights the predicted gap in research for secondary and Australian contexts.

The research focus: *The use of outdoor learning spaces in shaping student learning experiences in Australian secondary schools* and supporting research questions guide the exploration of literature in a systematic and inductive manner. Findings and projected insights from the research reveal that there are many benefits for using outdoor spaces that extend beyond the specific content focus of a learning area. These benefits include human nature relationships, independence, health and wellbeing, engagement and participation, and increased knowledge and skills. Although constraints and challenges for using outdoor learning spaces are also acknowledged in the research, the literature also provides possible solutions and ways to respond positively to issues. Therefore, the initial premise for this study which recognises the positive influence of outdoor learning spaces on students learning experience, is supported through the literature reviewed.

Creating an inclusive space where students are comfortable and feel secure in sharing their ideas, thoughts and feelings significantly and positively impact upon the learning experiences of students. According to the experiences of students and teachers recorded in the literature reviewed, outdoor learning spaces enable these positive learning experiences to occur. They also increase students' confidence in their own unique skills and capabilities, develop positive

and constructive relationships between teachers and students and help to make learning relevant and connected to real life experiences.

A direct alignment is recognisable between these benefits afforded by outdoor learning experiences, and student-centred and inquiry-based pedagogies recommended for adolescent students. In a report focussed on developing lifelong learners in the middle years of schooling, Pendergast et al. (2005) states:

*There needs to be an emphasis on making relevant connections for students between theoretical underpinnings and real-life experiences, with consistent efforts made to maximise experiential learning. Second, students need to be 'connected' to teachers as mentors (and, where possible, connected to other adult mentors within the school or broader community), to maximise the 'zone of proximal development' which they experience in the learning process. (Pendergast et al., 2005, p. 59)*

Therefore, in conclusion, with the continuing aim of schools to improve learning experiences for students, it is highly recommended that secondary schools in Australia utilise outdoor spaces for learning across and within learning areas. Also recommended is that further research is carried out to facilitate the gathering of evidence and documentation in relation to the use of outdoor learning spaces in these secondary contexts. Gathering data that reflects benefits, challenges and constraints when using outdoor learning spaces is vital to gain new knowledge and improve the use of these environments. Gathering data in relation to the unique contexts provided by Australian secondary schools is also essential for the success of future projects and supporting students to thrive in the school environment and reach their full potential in school and beyond.

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