The Role of Landscape Architecture in Learning for Sustainability

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It is not often that the Landscape Architect might think of him/herself as an educator, a teacher. Though they may create environments of experience, there are likely few who correlate that with learning. Whilst scholarship in Landscape Architecture has equipped the designer with the skills to create a learning environment, if those skills are not realised, they may be underutilised. At an increasing frequency academic work in the field of sustainability is focusing on the importance of education and the ways in which it can empower and equip people to achieve a sustainable future. Landscape Architects need to respond to this development and recognise another of their potentials; to design environments that support and encourage Learning for Sustainability. Through the identification of landscape attributes that influence learning, this thesis sets out to equip the Landscape Architect with an increased appreciation of their role in the cycle of education. The phenomenon of experience is the underlying feature of landscape-based learning. Accordingly, theories and practices employed by the designer that have foundations in experience and appear to affect Learning for Sustainability are explored. Also investigated are theories of education that focus on the phenomena of experience – theories that demonstrate possibilities for application in the designed landscape. Resulting from an extensive review of literature and the undertaking of two New Zealand based case studies, this thesis concludes with three key areas through which the Landscape Architect may positively influence Learning for Sustainability: the introduction of explicit learning cues to the landscape; the implementation of designs that support the implicit value of the landscape in learning; and consideration of the landscape user during the process of design.

Keywords: Landscape Architecture, Design, Learning for Sustainability, Sustainability, Education, Learning, Case study

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Prologue

It is the beginning of autumn. Imagine entering your local botanic garden just as the trees are losing their leaves. Following a gravel path between the magnificent oak trees, you step around a late-blooming flower. It emerges from a soft area of dirt, on a section of pathway devoid of gravel – the metal now a small river-like braid in the grass; washed off the path by a steady rain earlier in the week. As you crunch through the newly fallen leaves, you tread on something hard - an acorn. You realise that the acorn has fallen from above, and looking up you notice many more nestled amongst yellowing foliage. The ducks that often follow you in the hope of a bread crust are now feeding by the stream, more interested in your recent discovery – the acorn must be a food source for them in the autumn. "How do you crack through that hard shell?" you question. As the path winds lazily through the trees you enjoy what the gardens have to offer, especially noting the abundance of different birds foraging in the litter of leaves. The autumn foliage produces brilliant colour. There is a board explaining the life cycle of the oak tree. It is significant to the area - how interesting it is that the oak first produces acorns when it is 20 years old!

You may not notice but you are following a path *designed* to be of least disturbance to the surrounding environment - one that will allow you a time of sensory exploration and relaxation without a major impact on the surroundings. You are provided with a constant route, even though it moves through an environment of distinct seasonal change. That same path may present a variation of experiences and aesthetics each time you visit, but the signage remains the same; it presents facts, no matter what the season. You are in fact learning, through both implicit (learning from the landscape) and explicit (education on certain selected areas) means.

In the future, if you were to analyse your movements, you may follow a similar route of least disturbance through native bush without trails or signs, treading lightly around emerging seedlings just as you did around the late blooming flower in the botanic gardens. You may notice the berries that fell from the karaka tree and gaze upwards. A kereru rustles above, plucking berries in the lofty branches. Is that observation a direct result of your botanic garden experience? An experience that was *designed* to minimise disturbance to the environment and at the same time presents an opportunity for you to interact with nature. Theory in education suggests that the two experiences link together - the memory of previous experiences is believed to directly impact on how you interact with and treat future experiences. This is an integral part of learning.

While one must not forget that the designed landscape is multi functional - the realm of varied ecologies and aesthetics, functional uses, cultural and historical meanings (Mening, 1979; Nassauer, 1995; Saunders, 2008; Treib, 1995), it has been long understood that this immense space or 'landscape', to which it is referred, through its multitude of phenomenon, opportunities and processes, is inherently educational (Brezinka, 1992; Coe, 1994; Eisenstein, 2001; Nassauer, 1995; Seamon, 1979). This anecdote highlights the inherent (implicit) learning value of the designed landscape, alongside the more explicitly educational use of an informative signboard. It proposes that use of the designed landscape may contribute to future choices and understandings in the non-designed environment. It sets the scene for the for this research and highlights that the Landscape Architect, through their role in the design of the physical environment, is highly influential in creating spaces for learning.

Chapter One

Introduction

1.0 Introduction

The modern pace of life today has brought with it an expectation that education, and learning, should be instantaneous. The emphasis on a primarily academic way of thinking appears to be overpowering practical landscape-based learning; recognition of education in the landscape often limited to signboards. This research follows the assumption that the landscape has implicit educational value – it is a place of experience and therefore people can learn from their use of it (Association for Experiential Education, 2007; Bixler & James, 2008; Cole, 2007; S. H. Davis, 1993; Emmelin, 1976; Hiss, 1991). The research focuses on the role of the designed landscape in learning and is particularly interested in techniques that go 'beyond the signboard'. It recognises the strong link that Landscape Architecture has with education, through the realm of expereince. It supports the current multidisciplinary push toward a broadened scope when educating in the field of sustainability.

This research seeks to investigate and formalise the role of the designed landscape in Learning for Sustainability, providing an increased understanding of theoretical and practical site design techniques and strategies that can be utilised by the Landscape Architect to aid in this area. It highlights the link between Landscape Architecture and education and explains that when certain theories and practices of Landscape Architecture employed in the designed landscape they are influencing Learning for Sustainability. To explore this area, this research investigates two questions: 'How is Learning for Sustainability theorised, applied and implemented in the scholarship and practice of Landscape Architecture?' and 'How does the designed landscape direct learning outcomes in relation to ecological environmental sustainability?' By way of an extensive review of literature, followed by two New Zealand based case studies – the designed landscapes of Waitangi Park, Wellington and Paradise Valley Springs Wildlife Park, Rotorua - results will be obtained and conclusions drawn.

The following section will explain how the re-emergence of landscape-based learning is important in achieving a more sustainable future for the world, and how the Landscape Architect is in a prime position to be involved.

1.1 Research context

A discipline of importance: Landscape Architecture

The Landscape Architect *"...conduct*[s] *research and advise*[s] *on planning, design and stewardship of the outdoor environment and spaces, both within and beyond the built environment, and its conservation and sustainability of development"* (International Federation of Landscape Architects, 2003, p. 1). So in the midst of a world fraught with environmental debate and conflicting environmental messages, Landscape Architects find themselves in a position of importance. With a wide-ranging influence on the environment, the profession is presented with the opportunity to be a voice for the sustenance of all things landscape (Amidon, 2005; New Zealand Institute of Landscape Architects (a), 2012; Seamon & Mugerauer, 1985).

Worldwide, the profession of Landscape Architecture maintains the desire to develop an understanding of landscape with regard to its links to culture, the social and ecological environment, and sustainability. It is thus evident that Landscape Architecture is a profession that contributes to peoples' quality of life and the sustainability of the world's greater environment. Consequently, progression in both research and practise is essential (International Federation of Landscape Architects, 2012; New Zealand Institute of Landscape Architects (b), 2012; The Infrastructure Research Initiative at SWA, 2011).

The recent trend of interdisciplinary scholarship and corporate responsibility sees many professions today tending toward an ecologically and socially responsible 'sustainable' future in which the understanding of, and advocacy for sustainable behaviour is encouraged (New Zealand Business Council for Sustainable Development, n.d; Royal Botanic Gardens Melbourne, 2011; Thompson & Sorvig, 2008; Wilson-Hill, 2010). Thayer highlights the importance of the design profession(s) in this process. His questioning of how people are to *"...prepare themselves for a changing world if they have no places to practice what that world will be or could be like..."* (1998, p. 121) suggests that Landscape Architecture, a discipline Arno Sighart Schmid asserts is *"called upon to contribute towards safeguarding the viability of the natural environment and towards developing and maintaining a humane built environment in cities, towns and villages"* (Schmid, 2000), has the potential to play a considerable role in the communication of this knowledge and thus the facilitation of a sustainable future alongside other disciplines.

Thayer's recognition of the need for 'places' to experience examples of environmental sustainability and practice supports those current trends of the Landscape Architectural and allied design disciplines that suggest a population educated on sustainability will better serve a sustainable future (Ministry for the Environment, 2012a; New Zealand Business Council for Sustainable Development, n.d; Wilson-Hill, 2010).

Illustrated in this section is that Landscape Architecture could be involved in education through the experiential communication of knowledge. This research seeks to develop this area by offering the Landscape Architect an improved understanding around enhanced and holistic ways of caring for the environment, through design of the environment.

Landscape Architecture and its developing position in education

Having situated the discipline of Landscape Architecture within the topic of education, offering an explanation of the importance of Landscape Architecture's involvement in the sustainable future of this world, this section can now present the current stance of the discipline with regard to sustainability and education. It will reinforce the area for development by highlighting the gap within current Landscape Architectural scholarship and practice.

Current Landscape Architectural research and practice recognises the importance of Landscape Architects forming an understanding of the cultural, social and ecological links in sustainability. Although it has been found that if the public is unaware of those links, the positive messages represented through design of the landscape may be overlooked (Miller, 2001). William Eisenstein, a theorist in ecological design, talks of this issue in suggesting that *"...little of the*

[sustainable] *discussion* [in ecological design] *has focused on…*[the public]*, and how they might live more sustainably… or, equally importantly,* ***how they might develop a greater understanding*** [researcher emphasis] *of the ecological crisis and the natural cycles that sustain all life, including their own"* (2001, p. 1). Other fields, for example the educational and business sectors, are focusing discussions about sustainability around the recognition that a better-educated population will aid in a more 'sustainable' future, and are investigating means of doing so (Enviroschools, n.d; Ministry for the Environment, 2012a; Royal Botanic Gardens Melbourne, 2011).

Currently in Landscape Architecture there is a developing field of research regarding children and the educational opportunities for learning through expereince of the designed landscape, as indicated in recent publications by Jill Rice (2012) *From Playgrounds to Play Gardens,* and Sue Wake (2012) *Graft Union in the Playground*. Though many recent Landscape Architectural research publications have focused on the realm of children's landscapes and their relationship with environmental education, there is little emphasis on Landscape Architectural theory and practice regarding the general 'public landscape'[1] and the designers potential role in providing learning opportunities for the adult user, with regard to sustainability; accordingly, this notable void has directed the focus of this research.

Identified in this section is an area of Landscape Architectural scholarship and practice that holds great potential in landscape-based learning and therefore requires attention – sustainability education via the experience of 'landscape'. The next section will explain the relationship of key terms of reference for this study to the profession of Landscape Architecture, and further situate the discipline in the landscape-based public educational role this research suggests is essential for a more sustainable future.

[1] Landscapes of public access, not including the grounds of educational institutions

1.2 Terms of reference

The topic of 'education' is vast. It encompasses the inherent educational qualities of experience, right through to the highly prescribed, taught and graded education system.
To define the Landscape Architect's position in education, many terms will be used that come from the field of education. An understanding of the terms and their meanings in the context of landscape and Landscape Architecture is therefore required.

This section will explore the key terms to be used in this thesis. It will locate them within Landscape Architecture, and define them for this study. The section will begin with a background to the fundamental focus of this thesis – sustainability and experience-based education. It will then highlight the key areas from which this thesis has recognised possibilities in experiential landscape-based learning - Environmental Education, Education for Sustainability and Learning for Sustainability. It will summarise by defining key words to be employed throughout this thesis, and will offer an explanation as to the importance of using the word 'learning' in place of 'education' when relating the realm of sustainability education to the Landscape Architectural discipline.

Sustainable theory and education

From the late 19th Century, in all but name, the concept of 'sustainable development'[2] was used in city planning to cope with the effects of the industrial revolution (D. F. Brown, 2006). Hodge; cited in D.F. Brown's *Back to Basics* noted that *"...self-interested parties..."* (2006, p. 103) often introduced the ideas of sustainable development to promote a positive image of their city, though not necessarily enabling the citizens to take the issues into their own hands and work alongside those parties in the development. Sustainable theory, following these somewhat top-down and narrow-minded applications of sustainable development, began to shift toward the notion that a people-first response to development would better provide for a sustainable future (Carter, 2006; Eisenstein, 2001; Hopkins, 2009). As such, there was a move

[2] *"...development that meets the needs of the present without compromising the ability of future generations to meet their own needs"* (World Commission on Environment and Development (WCED), 1987, p. 43).

toward the idea that a sustainable future would rely on an educated population. The movement of 'environmental education' was in part brought about by this recognition. Evolved over years, it was a term that was formally recognised by 1970 (Palmer, 1998). It is from this progression that education on sustainability and consequently the terms 'Education for Sustainability' (GreenKiwi, 2011a) and 'Learning for Sustainability' were coined, in recent years.

Environmental Education and Education for Sustainability

The previous discussion has explained the emergence of sustainability education as a recognised need in the future of this world. With the aim of exploring the realm of spatial design and its potential influences in education regarding sustainability, the need arises to first explore, and then ground this Landscape Architectural-based study within the current formal curriculum-based education system, to maintain a consistency with the direction the educational disciplines are taking to provide sustainability education. The following discussion will explain the phrases' commonly employed by more formal educational institutions when referencing landscape-based education. It will uncover the reasons for the use of the term 'Learning for Sustainability', highlighting that the term 'learning' may better support the commonly indirect and passive nature of landscape-based education when related to Landscape Architecture.

Environmental Education was defined as *"...fostering an awareness of environmental issues and problems, developing these skills to solve those problems, and inspiring a willingness to make effective decisions as action-oriented citizens"* (Cole, 2007, p. 37). This definition has been revised over time to include relevant issues of social justice, economics, politics and culture (Association for Experiential Education, 2007; Cole, 2007). While providing the means to a positive outcome, the term focuses on the understandings, values and skills associated with *physically improving*[3] the environment (Robottom & Hart, 1993, p. vi), with less emphasis on the practical ways in which one can achieve environmental sustainability. It provides a wide range of possibilities, however they are more explicit in their educational nature, requiring a formal educational setting and technique to achieve their outcomes. Literature suggests that the landscape in itself maintains a less formal educational technique. The realm of 'environmental education' will contribute to the initial research within this thesis though 'environmental education' will not be employed as a term in its formal capacity.

The term 'Education for Sustainability' encompasses the spectrum in which lifelong learning plays a part in modifying and improving the dispositions of people. The term relates more specifically to the profession of Landscape Architecture than to that of environmental education, simply through use of the word *'for'*, which indicates that its purpose is 'practical and solution seeking' (GreenKiwi, 2011b). The term, however, is still employing the word 'education' that, similarly to environmental education, suggests it is associated with a formal or institutional method of teaching. The replacement of the word 'education' with 'learning' is discussed in the following section.

Neither of the terms – Education for Sustainability, or Learning for Sustainability - is commonly used presently with reference to the profession of Landscape Architecture. The following section will discuss the modification of the phrase Education for Sustainability into Learning for Sustainability to better suit this research and will define terms to be used throughout the remainder of this thesis.

'Ecological Environment', 'Sustainability', 'Education' and 'Learning'

From the previous section has emerged a phrase that will be employed within this thesis – Learning for Sustainability. It is important to note that the phrases Environmental Education and Education for Sustainability are recognised as important contributors to this research, though their structure is not as applicable to the Landscape Architectural discipline due to their more formal and perceived 'didactic' nature. This section will discuss the key words within Learning for Sustainability, and those words that have a strong relationship with that phrase, that will be employed throughout the remainder of this thesis. This section will ground the words in Landscape Architecture and thus provide

[3] A focus on techniques regarding the upkeep and improvement of the environment

a platform of understanding as to how this research defines, and will employ each.

The words 'environment', 'sustainability', 'education' and 'learning' will be commonly made reference to within this thesis. Each possesses multiple meanings and definitions depending on their context. For that reason, they will be examined and defined over the course of this discussion. The following will provide a lens through which the terms can be viewed with regard to Landscape Architecture and will reinforce the choice of the phrase Learning for Sustainability through its applicability to a landscape-based learning approach.

The 'Ecological Environment'

The term 'environment' is one that will reoccur consistently within this study. It is a word with a broad spectrum of meaning and context. The following will provide an insight into how it is often defined in Landscape Architecture, and how that definition may influence the direction of this research.

Eco-critic Harold Fromm (2009) suggests that 'environment' is a term that has grown in meaning over time; from the literal understanding of environment as *"...the stuff that surrounds us..."* (p. 95), to the intellectual and all encompassing view that environment is deep- rooted within ourselves. The Landscape Architectural profession has strong links, and thus great potential to aid in the natural and ecological aspects of this broad term, 'environment' (B. Brown, Harkness, & Johnston, 1998; Cadenasso & Pickett, 2008; Eisenstein, 2001; Gobster, Nassauer, Daniel, & Fry, 2007). It seems that the general public support the above definition, understanding 'environment' as all things natural and ecological (Nnadi, n.d). Indigenous peoples have always maintained a grounded understanding of environment, relating their understanding to the systems and spirituality of their environment more so than those foreign to the land (S. H. Davis, 1993; Högqvist, Nummelin, & Ståhl, n.d.). On interpretation of these understandings however, people in general appear to confuse 'environment' with 'nature'. Until there has been a shift in general understanding towards a view that 'environment' is all-encompassing; a part of oneself combined with the natural and physical aspects of ones' surrounds, understandings will likely maintain the confusion of environment with nature.

Futhermore, ts this study is situated within Landscape Architecture in New Zealand, it is important that the definition of environment relate to the New Zealand context. Landscape Architects in New Zealand are required to work with the Resource Management Act (RMA) 1991, so it is the RMA 1991 definition that is likely understood and commonly employed during projects within the New Zealand context. It is evident that the shift in definition toward an all-encompassing environmental scope has been embraced within the RMA 1991. The RMA 1991 defines 'environment' as:

(a) Ecosystems and their constituent parts, including people and communities; and

(b) All natural and physical resources; and

(c) Amenity values; and

(d) The social, economic, aesthetic, and cultural conditions...

Part 1, RMA: Interpretation and Application (Ministry for the Environment, 1991, p. 40)

It is important to note that although the Landscape Architect may grasp this broader definition of 'environment', the general public is likely to not have as developed an understanding. So points 'a' and 'b' will be of key focus in this research.

This research focuses on public education so will employ the term environment in line with the apparently frequently understood 'ecological environment'. Until there is a widespread shift in the general understanding of the term 'environment' to one that encompasses a full and holistic view (that encompasses all of the above points) the Landscape Architect seeking to educate with regard to the environment should refer to the more common understandings of the public. 'Ecological environment' is therefore defined for this research as 'Ecosystems and their constituent parts, including people and communities, and all natural and physical resources' (sourced from selected sections of the RMA 1991 definition of 'environment').

'Sustainability'

Sustainability is a term of widespread use. As a 'buzz word' in modern society, many definitions exist depending on the context in which the term is employed. Consequently the term will require definition and its own context for this research, which will be provided in the following section. This research focuses primarily on the ecological realm of sustainability, though sustainability also incorporates economic, social and cultural aspects. The foremost, though somewhat broad definition of sustainability provided by the (New Zealand) Ministry for the Environment (2012b), modified from the initial definition of 'sustainable development' in The Brundtland Report - 'Our Common Future' (United Nations World Commission on Environment and Development, 1987), reads *"...sustainability is about meeting the needs of today, without adversely impacting on the needs of tomorrow".*

Taking into account the definition of 'ecological environment' as described in the last section, the term 'sustainability' is able to be contextualised for this research. Sustainability is here defined as 'meeting the needs of today's 'ecological environment', without adversely impacting on the needs of tomorrow's 'ecological environment''.

'Education' and 'Learning'

The core of 'education' signifies that 'actions' are undertaken, motivated by a definite goal *"...to produce a certain effect in one or more other persons"* (Brezinka, 1992, pp. 38-39). It is a term that relates to the need of an 'educator' to assist others ('educands'/ pupils) in:
1: acquiring new dispositions[4]/outlooks
2: retaining, strengthening or improving one's disposition
3: weakening or eliminating ones' existing (negative) disposition
(Brezinka, 1992, pp. 38-39)
As discussed earlier, within the context of this study, the Landscape Architect is seen to provide an education through their design of the landscape, so becomes the educator.

[4] *'state of mind regarding something'* (Dictionary.com, 2012)

The definition of 'education' that appears in the previous section is from educational philosopher Wolfgang Brezinka. It is emphasised in the context of this research as it focuses on the role of experience in education. His experiential focus leads him to explain that 'learning' is a less formal facet of the 'directed' educational realm. 'Learning' refers to *"...all of the relatively permanent modifications of one's reaction tendencies...that result from experience,* [including] *all the informal and incidental acquisitions as well as the formally directed learning...education"* (Sawrey & Telford, 1958, p. 61).

While 'education' appears to be associated with structured learning environments and explicit education *on* something, 'learning' appears to support less formal means of education by acknowledging that experience allows one to learn *from* something. Educational philosopher Maria Montessori highlights the applicability of 'learning' to landscape-based education, believing that learning *"...comes from manipulation of the environment and...senses"* (Cooney & Jones, 2011).
The Landscape Architect may (knowingly or unknowingly) manipulate the landscape and subsequently improve aspects for landscape-based learning through enhancing the landscape's implicit and explicit educational value. Though the Landscape Architect is not physically present to educate the user *on* certain aspects, the possibility for the inclusion of supporting didactic educational aids is apparent. However, user experience of the landscape is the way in which they can take up much information. This suggests that the experiential process through which the user gains knowledge means they are learning *from* those designed aspects though this process may be supported by more didactic means. As the designed landscape is an environment in which many informal educational experiences exist to learn *from*, use of the term 'learning' becomes the most appropriate focus for this research.

Summary

This section has made clear how key words and terms are to be defined for the duration of this research. As the initial stage of this thesis draws on literature and explores a wide cross section of educational theory and practical techniques,

including Environmental Education and Education for Sustainability, the terms will be used as they appear in the texts. However in the later stages of the thesis, the use of 'learning' will be prevalent, as it has been recognised as more applicable to this research.

1.3 Theoretical context

An emerging opportunity for Landscape Architecture: Learning for Sustainability

With an understanding of how each of the key terms is defined for this research, one can begin to understand the relationship that Learning for Sustainability has with Landscape Architecture. The following section will explore Learning for Sustainability as a currently expanding field of both discourse and practise, and will reveal the key focus of this research.

The body of theory from which the topic of landscape-based learning can grow, and is growing with regard to Landscape Architecture, does not necessarily have a distinct focus on Learning for Sustainability. Research in Landscape Architecture that is relevant to sustainability education seems to not yet be formally recognising the effect of the expereince of the designed landscape on learning. It appears however that explicitly educational[5] theory shows a recognition of the possibilities of landscape expereince in learning. This shows that there is a link that can be further explored between the designed landscape, a place of experience, and formal educational theory.

Wolfgang Brezinka, a well-known theorist in education, appears however to have recognised this link between educational theory and practice, and design. He highlights the implicit value of *experience* and its contribution to learning – the landscape is a place of multiple levels of experience, so contains value for learning. He extends an invitation to the design professions to play their part in the increased sharing of knowledge, especially within the public domain. He supports the need for the design professions to enhance their understanding of how to design so the user may also understand their environment as it is intended, and recognises that "[the] *mere listing of the perceptible objects...that make up particular individuals' environments does not in itself provide sufficient knowledge to understand them"* (1992, p. 46). This stresses that the designer must first grasp an understanding of how their creations are influencing the education of the users. As a number of theories and practices of Landscape

[5] A conscious decision has been made to affect education

Architecture may be influencing Learning for Sustainability in the landscape, though may not be formally recognised for their potential in the area, further investigation is required, as is the aim of this research. The Landscape Architect who understands the possibilities of their designs as learning tools, may better support public learning possibilities by making perceptible a sustainable education, by way of the designed landscape.

Identified in this section have been two strands that flow throughout this thesis. Firstly, that the landscape is experienced, meaning it holds implicit values for learning and secondly, that explicit experience-based educational theory can be drawn upon to support understandings about how to design for landscape-based Learning for Sustainability.

The design professions have a role to play in the learning process through the manipulation of the landscape to enhance user experience. Investigation into the experiential Learning for Sustainability values of current Landscape Architectural theory and practice is therefore important. This research explores and formally recognises the link between Landscape Architecture and Learning for Sustainability.

The following section consolidates these findings into two questions that will be investigated to obtain the results of this research.

1.4 Research questions

The previous sections have linked the landscape to experience and experience to Learning for Sustainability. They have demonstrated the area into which Landscape Architectural research is required, which has guided the objective of this research. To recap: this research seeks to investigate the role of the designed landscape in Learning for Sustainability, providing an increased understanding of theoretical and practical site design techniques and strategies that can be utilised by the Landscape Architect to aid in this area.

Based on initial research that suggests the designed landscape holds educational value, as it is associated with the phenomena of human experience, the following questions have been asked:

'How is Learning for Sustainability theorised, applied and implemented in the scholarship and practice of Landscape Architecture?'
and
'How does the designed landscape direct learning outcomes in relation to ecological environmental sustainability?'

1.5 Methodology overview

Inspired by the recognised need for people to develop a greater understanding of ideas through which the environment may be better sustained, this research will explore the interrelationship of the landscape, education, and site design. This research employs a case study methodology to investigate information acquired from an extensive literature review, site observations, and key informant and participant interviews. It uses phenomenology as a tool through which results, both site observation and participant interviews, are analysed.

Two case study sites were investigated, both located in New Zealand: Waitangi Park, Wellington and Paradise Valley Springs, Rotorua. The reasons for the choice of these sites is discussed further in chapter three, and chapter four provides an introduction to and exploration of the sites.

Founded during the twentieth century by Edmund Husserl and then developed further by the likes of Martin Heidegger, phenomenology focuses in its most basic form on the interpretation of human experience (S. Davis, 2009; Seamon & Mugerauer, 1985). As a philosophy, phenomenology assumes *"...that knowledge does not exist independently of man - that knowledge must be gained through man's lived experience of the world"* (S. Davis, 2009, p. 76). It focuses on the object of perception or experience and how a person observes and learns, as a direct result of their experience (William Collins Sons & Co Ltd, 1987). Experience has two parts - objects of consciousness and acts of consciousness (World Book Inc, 1990), which are described below in 1.4.1.

A brief explanation of the application of phenomenology as a tool for analysis in this research follows.

Phenomenology as a tool for analysis

At the core of this research lies the complex relationship between the person (landscape user) and the environment (natural or designed) in which that person lives. With the aim to reach conclusions beyond that of the 'signboard' approach to education and find answers that consult this experience-based interrelationship between education of the user and the environmental phenomena they encounter, one can recognise the importance of a phenomenological mode of analysis and how it may play a part in interpreting this link. Employed in this research, phenomenology is a tool for analysis that focuses on finding commonalities and differences in user responses regarding their landscape-based learning experience. The influences of experience on learning will be deciphered by interpreting the results of the case studies within three key phenomenological areas (see also figure 4-1, page 44):

The **World** (the place in which phenomena occur) is formed of two key features:

- Objects of consciousness (for this study a description of the physical case study sites and their design intent)
- Acts of consciousness (for this study the user explanation of their perceived reasons for use and understanding of the sites)

The **Essence** of the experience (what is meaningful and of importance to the creation of experience in the 'world') covers the two areas of 'landscape' that have an influence on users' Learning for Sustainability in these sites, that fall under the umbrella of 'design':

- The 'Implicit' (in built, already existing) learning values of landscape (for this study the description of implicitly present aspects appearing to affect Learning for Sustainability experience – designed or otherwise - for each site)
- The 'Explicit' (intended cues for learning) learning values

of the landscape (for this study the description of explicitly designed cues for education appearing to affect Learning for Sustainability experience at each site)

The **Lifeworld** (the flow on effect/ personal gain from experience) highlights two key areas of understanding that are influenced by those identified 'essences' of experience:

- Value (for this study the description of what users describe as the valuable aspects of the site that appear to have had an influence on their learning)
- Understanding (what knowledge users take from the site in terms of sustainability)

By employing phenomenology as a tool for analysis, results of the case studies can be analysed in depth and real-life experience regarding landscape-based Learning for Sustainability better understood. The perception of the user regarding their learning experience at either site will emerge. The Landscape Architect may then have a better understanding of the implicit learning values those landscapes hold, alongside the apparently successful explicit educational techniques employed as learning tools within those landscapes. A phenomenological tool of analysis will also help to determine what knowledge relating to the concepts and application of environmental sustainability the 'public' already hold (by way of pre-understanding) and what significance, if any, designed 'interventions' have in increasing or supporting that existing knowledge.

This methodology will enable research that seeks out the instances in which designers are presently influencing learning experiences for sustainability, highlighting opportunities into which the Landscape Architect can look further to develop Learning for Sustainability within their local landscapes.

1.6 Guide to chapters

Chapter one, Introduction, establishes an area within Landscape Architecture for further research and development: the role of the designed landscape in Learning for Sustainability. It discusses how Landscape Architecture fits within education and explains key terms to be employed throughout this research. It then presents the objectives of the research, those research questions explored and an overview of the methodology employed to reach those objectives.

Chapter two, the Literature Review, is split into two sections and is a response to the first research question - 'How is Learning for Sustainability theorised, applied and implemented in the scholarship and practice of Landscape Architecture?' The first section further explores the link between Landscape Architecture and education and discusses the landscape as an aid to multidisciplinary learning. Section two builds on the identified implicit learning value of the landscape through the identification of key theories and practices in Landscape Architecture that appear to have an experience focus, and discusses experiential theories in the realm of education that support Learning for Sustainability.

Chapter three, Methodology, describes the methods followed to complete this research. It highlights the use of case study research to obtain results, and the use of phenomenology as a tool for analysis of those results.

Chapter four, Results, provides an initial response to the second research question - 'How does the designed landscape direct learning outcomes in relation to ecological environmental sustainability?' by exploring the findings and responses obtained by way of case study research. It presents the results as interpreted with the phenomenological tool of analysis.

Chapter five, Discussion, further responds to the second research question. This chapter offers a summary of those ways in which the case study sites of this research influence Learning for Sustainability and explains the public perception of a learning landscape. Then it explains how the landscapes influences on learning, as determined in the results, can be broken down further. It then discusses those influences.

Chapter six, Conclusions, presents the conclusions of this research. It explains the role of the Landscape Architect in the creation of landscapes that promote Learning for Sustainability. And it formalises the notion that Landscape Architectural theory, when applied, is a space in which Learning for Sustainability occurs and is supported.

1.7 Introduction summary

This introduction has identified the possibility for the Landscape Architect to be involved and integrated in Learning for Sustainability within the physical environment. It has explored terms to be employed in this research, has presented the objectives to be met and has highlighted the methodology to be applied.

The following chapter will further explore the link between Landscape Architecture, education and sustainability. It will identify key theories relating to the experiential realm of Learning for Sustainability, offering a solid foundation of literature fundamental to this research.

Chapter Two

Literature Review

2.0 Introduction

The previous chapter established an important area within the discourse and practice of Landscape Architecture for further research and development: the experience-based influence of the designed landscape on Learning for Sustainability.

The first half of this chapter will explain the link of Landscape Architecture to education. It will illuminate how the Landscape Architect holds a teacher-like role and will offer an explanation of the landscape as an experiential learning environment that is a dynamic aid in learning.

With an understanding of how learning is best achieved, it will then explain the direction in which sustainability is moving in New Zealand and will make clear the importance of the Landscape Architectural discipline supporting those common motivations in sustainability.

The second half of this chapter will then build on the identified implicit learning value of the landscape through the identification of key experience-based theories and practices in Landscape Architecture that support Learning for Sustainability. Education is the banner under which this research ultimately sits, so the second half will also explore the realm of experience in the educational discipline with relation to its potential in landscape-based Learning for Sustainability. It will highlight that these more explicit means of educating are also at work in the landscape, and will offer a suggestion of where theories and practices of education can be applied to Landscape Architecture.

2.1 Merging sustainability, Landscape Architecture and education

The concept and theory of 'sustainability' focuses largely on the future effects that current practices and ways of living will have on the world's environment (Byrch, Kearins, Milne, & Morgan, 2009; Eisenstein, 2001; Saunders, 2008). As key players in the design of present and future environments (Eisenstein, 2001; International Federation of Landscape Architects, 2012; Saunders, 2008) it could be said that Landscape Architects hold a prominent position in designing for 'sustainability'. Considered alongside 'education' and the notion that education is the *"... passport to the future..."* (Little, n.d.), the opportunity arises to look into how Landscape Architects can design landscapes that aid in Learning for Sustainability. Whilst sustainability-based education has been a focus within the educational sector for some time – the broader concept having been *taught* in school and tertiary environments – a lack of consideration has been given to the influences and possibilities of the designed landscape and the ways it too can contribute to sustainability learning.

While the Landscape Architect may not consciously *intend* to design landscapes that aid in Learning for Sustainability, research suggests that the landscape, in general terms, has a strong educational influence on its user (Brezinka, 1992; Coe, 1994; Eisenstein, 2001; Nassauer, 1995; Seamon, 1979): *"...subconsciously we are all trying to read and understand the landscapes we live in..."* (Heatherington, 2007, p. 15), which ultimately leads to a learning experience. Supported once again is that the landscape is implicitly educational by nature. Designer understanding of the inherent value of the landscape for learning is important if designers are to aid in the sustainability movement, in which education has been recognised as a key element of its success. Lack of developed research into this area however has led to designers often making uninformed

presumptions as to the educational impact of their designs (Eisenstein, 2001). William Eisenstein supports the furthering of designer understanding in this area:

...designers must think clearly about the experience of the users...and particularly about the meanings and lessons that they derive from their surroundings. The ways that people learn from and respond to the...environment are critical to the prospects for sustainability, if for no other reason than that for most of us, it is the landscape...that helps to shape our view of nature and our relation to it
(Eisenstein, 2001, p. 1)

This highlights the importance of the Landscape Architect understanding how users 'learn', and how education can be achieved by first-hand experience of the designed landscape. As this research will show, the 'experience' that the designer provides is critical in the users view of, and relation to nature.

Carried throughout the remainder of this chapter is this recognition that the designed landscape is influential in learning, especially within the everyday public landscape, and that landscape-based learning possesses ties with higher education. Discussed from now on will be the areas into which exploration is required to offer an increased understanding of everyday landscape-based Learning for Sustainability with relation to the discipline of Landscape Architecture.

2.2 The educator, the student and the learning environment

The previous section has explained that expereince is a characteristic that binds the designed landscape with Learning for Sustainability. The landscape, whether designed by man or in its natural state, was identified throughout supporting literature as a place of learning. This section will look into the influence of the Landscape Architect on the designed learning landscape. It will identify the designer as an educator and the public users of the landscape as the educands (students). To build on this means that one needs to understand the influence of the designer on learning. The important defining characteristics of the educator, the needs of the educand, and the creation of learning environments will therefore be discussed.

The Landscape Architect as an educator

Learning is a lifelong process (Miller, 2001). It often includes an educator; the person who educates (or the facilitator of learning), and an educand; the student(s) who are educated (Brezinka, 1992), though education can also be self driven. Education is often observed as the process of the educator attempting to assist their student in changing their disposition[1] (Brezinka, 1992; Carr, 2001; Tishman, Jay, & Perkins, 1992). 'Learning' refers to both the informal learning experiences alongside those formally directed learning situations. Whilst changes influenced by the educational or learning experience may not be immediately recognised, they can be manifest over time throughout teacher driven activities or during self driven encounters (Cooney & Jones, 2011; Te Kete Ipurangi, 2007; Walker, 1996). The potential of the Landscape Architect therefore to be involved as an educator in the realm of Learning for Sustainability lies in the physical manifestation of educational ideas and techniques that have the potential to be experienced time and again through teacher or self directed processes. These expereinces may therefore contribute to immediate learning or learning over time.

The influence of the Landscape Architect in learning can be recognised as they are programming learning into sites; acting as facilitators of learning no

[1] *n.* a person's usual temperament or frame of mind; a natural or acquired tendency, inclination or habit in a person or thing (Dictionary.com, 2012)

matter what actual objectives are intended. It is important that sites portray sustainability positively as the designs essentially impact on a 'students' disposition regarding sustainability through their formal or informal experience of that landscape. Whilst earlier discussion in this research has focussed on the implicit nature of the designed landscape, this explanation has focussed on the designer as the manipulator of that implicit value and therefore has recognised them as an underlying educator.

Where there is an educator there must be a student[2]. An understanding of how learning can be directed (depending on the 'student' group(s)) will be of benefit when designing landscapes that enhance Learning for Sustainability. Two key learning areas arise that relate to the public student body, which is the focus of this research. Those are pedagogy and andragogy. The following section will discuss these areas and will advise on their relevance to the creation of the Learning for Sustainability landscape.

The Student

Analysis of literature thus far suggests the Landscape Architect can take on the role of educator when creating landscapes. As an educator one must understand their pupils. The following presents pedagogy and andragogy, two fields of educational theory that provide valuable insight into how prospective students best learn, and therefore how one may manipulate the landscape to positively affect the student body.

All students learn as they interact with their environment (Raiola, 2011; Robottom, 1987; Robottom & Hart, 1993; G. A. Smith & Williams, 1999). The landscape lends itself to learning in two distinct ways – as a place in which education can be provided and monitored, or as the place of informal self-learning. The framework of the pedagogical theory of education appears to support the landscape as a classroom in which lessons can be taught, whereas andragogy appears to refer to the landscape as a place in which self-directed learning can occur. It is the potential to cross over these ideas that this section highlights.

[2] The 'students' made reference to during this research are those who are not presently involved in a formal educational system (such as a school or tertiary institution), though may be involved in a community group or other public initiative educating them for sustainability

The field of pedagogy assumes a student of 'childlike' dependent personality, with limited experience. It presumes that education should be directed, based on age-level and oriented around a particular subject (Guffey & Rampp, 1997; Sipe, 2001). The andragogical field on the other hand considers the learning techniques of the 'adult'[3] learner. It is believed that andragogical learning is voluntary - driven by a need or an encountered problem to overcome (Kerka, 2002; Sipe, 2001; St. Clair, 2002; Tice, 1997). Adult learners require learning to be meaningful, autonomous and self-directed. Prior experience is noted to be a source of learning.

Educational philosopher Maria Montessori however asserts that the voice of the student 'should be the loudest' in their education (Miller, 2001). As her theory is based around the 'child'[4] learner, this conflicts with the recognised dependence of pedagogy, though coincides with the self-driven learning of andragogy. Her belief in student driven learning therefore suggests possibilities for the crossover of the pedagogical and andragogical learning environment. Whilst the two areas of pedagogy and andragogy have been separated in the past, recent literature supports Montessori's beliefs by suggesting that the difference in learning outcomes does not lie in the techniques used, but in the learners themselves (Kerka, 2002; Taylor, Marienau, & Fiddler, 2000). In other words, one learner entering a landscape may be influenced in a completely different way to the next; the reason why this research seeks to explore a number of landscape-based learning influences and therefore ways in which the Landscape Architect can better cater for multiple learning types.

Taylor, Marienau and Fiddler (2000) believe that the difference in learners can be found in their life experience, meaning pedagogical or andragogical techniques may have a dissimilar effect on different learners in different situations. The andragogical technique in itself is believed to be insufficient to shape the education of adults (St. Clair, 2002) so although the general public, namely adults above 16 years old, are the focus of this research, this research will not limit its ideas to techniques found in andragogy. It will maintain a focus on the crossover of the explicit educational possibilities and the implicit value of the landscape in learning. This research will allow those educational

[3] 'Adult' refers to those with greater life experience in this instance
[4] 'Child' tends to refer to those with lesser life experience

theories and techniques evidently driving learning in the landscape to emerge throughout the research process.

Further supporting the need to allow landscape-based influences on learning to emerge is the school of thought surrounding the importance of context in learning. Experiential education theorist Edward Raiola transcends either learning field discussed earlier in this section by recognising the need for contextualised learning: *"...students learn in accordance with their own purposes (or needs) and prior experiences..."* (2011, p. 181). Rather than focusing on the techniques employed in learning, he believes the context and the degree to which the user can relate is a strong factor influencing learning possibilities, meaning possibilities for site-based learning may rely on context. Further on in this chapter are discussed the aspects of sustainability currently in focus around New Zealand and the world that offer a context through which Learning for Sustainability can be supported through landscape design. Now however, the focus lies upon student(s) needs in Learning for Sustainability. Emmelin (1976) and Haugen (2010) express that an approach to sustainable education that includes input from the community is of benefit to learning. They believe that the community addressed will be the community who learns. So it is not only the individual student to which the Landscape Architect caters, but also the entire community. Also of benefit in environmental learning directed at adults is the acknowledgement of the students' input (Haugen, 2010). This suggests that even the planning and design *process*, in addition to the actual designed spaces, may be an area through which adult based learning could be achieved.

The previous two sections have explained the position of the Landscape Architect as an educator and the dynamics of the students they are to influence through design. Consequently the question arises as to the type of environment that best caters for those students and their different learning styles. In metaphorical terms, the landscape is a classroom - a place of self-driven or directed learning experience. The following section will highlight key features of the learning environment that may prove beneficial if included in the designed landscape of sustainable learning.

The learning environment

There is no one formula or environment that guarantees that the student will learn in every circumstance (Kerka, 2002; Te Kete Ipurangi, 2007) although the transformation of the environment into a place of active engagement is believed to support learners (Garrison & Vaughan, 2008; Kerka, 2002; Kuh, Schuh, Whitt, & Associates, 2005). Furthermore the creation of a supportive, inclusive learning environment that not only fosters positive relationships but also fosters the cultural diversities of students is important, no matter the learners' age (Kerka, 2002; Te Kete Ipurangi, 2007). In most cases public landscapes are places of diversity in both user and use, so the requirements of the landscape designed with a layer of learning differ little from this description.

One key school of thought in the creation of learning environments revolves around the importance of emotion. Dr. Jeffrey Lackney, architect and professor at the University of Wisconsin explains that emotion aids in learning through promotion of short and long-term memory retention and recollection (Lackney, 1998). In designing to promote Learning for Sustainability the degree to which the landscape influences emotion and therefore potential recollection means learning is activated (Lackney, 1998; Miller, 2001). Lackney (1998) suggests that emotion can be influenced through the balance of stress and comfort one is confronted with in their environment *"...Too much and anxiety shuts down opportunities for learning. Too little and the brain becomes too relaxed and comfortable to become actively engaged*..." (Lackney, 1998). Here is suggested the need to create challenging yet thought provoking environments.

Contextual learning is also an important feature of the learning landscape. Edward Raiola's explanation of contextual importance to the student is supported by McInerney & McInerney (2010) who also believe that memory and recollections are supported by context, though in the physical learning environment. They push for that context and relevance to be translated into practice; in essence the landscape should provide possibilities for translation of learning into practice, at differing scales. For example, relevant place oriented

design based on local topics and phenomena, or designs referencing aspects of sustainability that users have knowledge of presently (perhaps via media, personal communication or other sources) may therefore prove beneficial in the learning opportunities provided by the designed landscape.

Learning is recognised throughout literature to be supported by possibilities to encounter new learning experiences a number of times in a variety of different tasks, scales or contexts are beneficial, otherwise known as repetition (McInerney & McInerney, 2010; Te Kete Ipurangi, 2007). Public landscapes are used frequently and so afford the opportunity to design for repetitive encounter through static, ephemeral or changing elements. Coombs, 1973, as cited in Smith, 1988, ch. 7, para. 1, indicates the importance of these publically accessible environments of repetitive use as an aid in learning stating that "*…every individual acquires attitudes, values, skills and knowledge from daily experience and the educative influences and resources in his or her environment...*" (1988). The modern push for sustainability is situated within many disciplines so the opportunity for repetition of sustainable ideas through their inclusion in the everyday landscape is recognised.

This literature has indicated that the process of developing a learning environment is dynamic. It requires the inclusion of various experiential qualities that not only relate to a site's physical context, but to the contexts of time and scale. Sites should be made relevant within the changing needs of both the environment and society. The Landscape Architect and those involved in the design and planning of public space must therefore consider future changes in knowledge and over time. They too need to keep learning so they can continue to create landscapes relevant to the time. They need to be aware that as the 'students'' needs change, so does the way their environment effectively helps them to learn (Kerka, 2002).

Summary

Though the Landscape Architect may not realise that they are providing a learning environment through design, it is important to understand that no matter what, people are educated by way of their use of space and the environment in which they live. Haugen asserts that *"…environmentalism should permeate every aspect of learners' lives…"* (2010, p. 10) so the realm of spatial landscape design should play its part to enable a connection between the user and their environment. If the designer can recognise that they are an important link in the creation of learning environments for their students and actively design for it, greater use of designed space to influence Learning for Sustainability may be achieved.

2.3 Contextual design: sustainability in society

The previous section has sited the Landscape Architectural discipline within the field of education. It has highlighted the importance of repetition and multiple encounters with ideas in differing learning situations and contexts. It has also emphasised the importance of context in both the topic and the place, of education. A broader understanding of sustainability and how other disciplines use and include it is therefore important if one is to understand how to design to support sustainability ideals, thus enhancing chances for repetition and application of existing user knowledge. The following section will outline various New Zealand sectors' or disciplines' (figure 2-1) ideas of, and goals for, sustainability. It will provide an indication of ideas that cross-disciplinary boundaries, and basic knowledge to which New Zealanders (including participants in this research) may have had access to, and therefore that have informed their understanding of sustainability concepts offered through site design.

Figure 2-1: Diagram showing the interrelationships to be discussed in this section (Robinson, D. 2012)

Sustainability in New Zealand

Sustainability in New Zealand is a cross-disciplinary subject. Whilst each discipline maintains its own definition and focus in this area, there appears to be a common direction toward which sustainability is heading. Emerging is the trend toward learning and education in the sustainability field, especially regarding the ecological environment.

The overarching focus of sustainability comes from the New Zealand Government that maintains a focus on management of natural and physical resource for the future whilst sustaining a quality of life for the peoples of New Zealand (Ministry for the Environment, 1991). Under this umbrella various business-based and public groups, along with educational institutions focus their sustainability goals. For example the New Zealand Business Council for Sustainable Development (NZBCSD) maintains a focus on the economic sustainability of New Zealand. Their sustainability agenda has a focus on economy, environment and society (figure 2-2), with the NZBCSD noting the

Image removed due to copyright requirements

Figure 2-2: '*New Zealand Forever*' (New Zealand Business Council for Sustainable Development, n.d)

importance of a better educated population in achieving their goals (New Zealand Business Council for Sustainable Development, n.d).
The NZBCSD spans a vast range of business areas so there is a high possibility that knowledge gained by their 'students' will be carried into sites designed by the Landscape Architect and will inform their interpretation of sites.

Public groups such as Transition Town initiatives, and Envirotowns, to name two of many, maintain a focus around the education and encouragement of public into a sustainable future. Transition goals focus on encouraging positive decision-making based on climate change and peak oil through a collective community response to resilience (Hopkins, 2009). Envirotowns act as a community role model to promote an understanding of sustainability as the basis for society, culture and economics and to encourage awareness and positive decision-making regarding sustainability (Lincoln Envirotown Trust, 2010). These types of public groups appear to focus primarily within the sustainability of natural systems and public wellbeing. Providing many opportunities for community members to become involved, it is possible that users of the designed landscape may have some knowledge of sustainability gained through a public group. Understanding, supporting and applying the goals of these local groups through landscape design could therefore provide a strong aid to contextual landscape-based learning.

The formal educational sector (schools and educational institutions) is perhaps the foremost supporter of all goals under New Zealand's sustainability umbrella. The New Zealand Curriculum Framework (NZC) for years 1-13 maintains a focus on the ability of students to be forward thinking citizens. Its goals for sustainability are broad, encompassing cultural, economic and environmental aspects (Ministry of Education, 2007). Under the banner of education lie a number of supporting organisations and focused initiatives such as the New Zealand Association for Environmental Education (NZAEE), the Enviroschool Foundation and the Education for Sustainability initiative. The primary goal of the NZAEE is to *"...provide a network and framework to promote environmental education initiatives in New Zealand; and to encourage and promote environmental education training for formal and informal sectors"(New Zealand Association for Environmental Education, n.d.),* supporting the educational need within the sustainable movement. The New Zealand Ministry for Education initialised the Enviroschools Foundation and the Education for Sustainability initiative. Focusing primarily on school-based education, these initiatives aim to promote positive decision-making for sustainability of today's and future environments (Te Kete Ipurangi, n.d.; The Enviroschools Foundation, n.d.). Whilst education in schools is not the focus of this research it is important to understand that there is a growing concern for the environment that is being directed toward the younger generations. Over time those children will be the users of public landscapes. It has been suggested that as public knowledge grows, their learning needs change. Future adult landscape users will undoubtedly be more knowledgeable regarding issues of sustainability. Landscapes that are flexible and able to change over time are important, while others may require modification to retain a contextual focus.

There are a number of public groups and initiatives with which the landscape user may affiliate, to act and learn. The earlier stages of this research have suggested that there is little public recognition of the designed every day environments' learning influence on, or aid to, these groups and initiatives. Creation of contextual learning environments is recognised to be of importance. The discipline of Landscape Architecture can work to promote landscape-based Learning for Sustainability through spatial design, especially supporting environmental learning goals, by maintaining links with wider disciplines and groups across New Zealand.

Summary

In the past the Landscape Architect has endeavoured to remedy cultural and environmental problems by means of design. To enhance public awareness of sustainability the Landscape Architect is indeed presented with, and participatory in, an opportunity to contribute and perhaps even direct learning experience though the design of landscape.

The literature has also shown that the Landscape Architect could provide further

landscape-based Learning for Sustainability through creating environments of educational engagement, as opposed to just the creation of space in which learning can occur. Knowing that common goals for sustainability are widely supported across varying sectors in society, the designer is afforded an understanding of what knowledge of sustainability may exist with regard to potential site 'users'. Support and inclusion of this knowledge into site design may build on satisfying the educational strategy that repetition of previously experienced ideas will improve learning uptake and recollection. If Learning for Sustainability is to be achieved through landscape design and become *"... intertwined with the concrete living conditions of a society"* (Brezinka, 1992, p. 46) the Landscape Architect with an understanding of their 'students', the ways in which they learn, and their pre-understanding of sustainability concepts, may be better equipped to design landscapes that enhance Learning for Sustainability opportunities.

Within the design and planning disciplines of Landscape Architecture and allied industries, the first half of this literature review highlighted the distinct lack of theory and case studies available that are formally recognised to aid in Learning for Sustainability within the designed landscape. It illustrated the need to explore wider theories and practices for learning in the landscape.

Therefore the review of literature was expanded, and sought to consider a wider theoretical and case study base, calling upon an expanded discipline range from which analysis could occur. A number of key fields have been included in this section to form a body of literature that relates to the implicit and explicit Learning for Sustainability values of the designed landscape, and within the Landscape Architecture profession specifically. The fields discussed are aspects of experience that were assessed to impact landscape use, and the landscapes' potential to educate through site experience.

The review now explores a number of explicit theories of higher education and learning to determine how and where the Landscape Architect, and the landscape itself, relates to 'learning' experience. It will highlight two distinct theories of higher education that can be applied to enhance the learning landscape.

2.4 Landscape Architecture: theory and practice

Emerging from literature is that the landscape is a place in which learning occurs by way of experience. A number of theories and practices within Landscape Architectural design appear to be implicitly educational. It seems they are often manifest in design, perhaps instinctively or without recognition. Some practices however are intended to educate, intended to deliver a meaning or suggestion. This section further explores the influences of the designed landscape on learning. It identifies a selection of landscape based theories and practices that work within the phenomena of experience, explaining how they may influence learning in the landscape, with special reference to sustainability.

Immersion and Acclimatisation

The theories of landscape immersion and acclimatisation support one of the central stances in sustainability – the enhanced connection of people to the world in which they live (Emmelin, 1976; Enviroschools, n.d; Palmer, 1998). An increase in the acceptance of humans as part of the worlds ecological system allows these theories, that have been previously somewhat limited to zoos and the human-animal experience, to be modified to include experiences pertaining human-human environmental understandings and experiences. The following will discuss their relevance to the improvement of Learning for Sustainability in landscapes.

Immersion occurs implicitly within the landscape - when one is provided with an authentic experience of another place (Bierlein, 2003; Coe, 1994). Literature in landscape immersion has a primary focus on the human-animal habitat relationship for which the term was coined by Coe in 1976 (Coe, 1994) though he likes of Bierlein (2003) describe the design of an immersive environment in a way that can relate to the developing understanding of the human-human relationship: *"...extending the complexity of the...environment into areas where visitors walk, stand or sit. The intent is to help them more easily imagine themselves as respectful interlopers in the...wild domain rather than feeling separated from the rest of nature"* (Bierlein, 2003). The application of landscape immersion usually requires minimised abstractions and emphasised specifics (Coe, 1994). Although it may seem that abstraction has occurred when in the urban landscape, it is important to remember that one could well be experiencing designed immersion within the human eco-system. The following example of the 'ChonGae Canal Point Source Park' may appear less than authentic, though the subject in question is the sustainability of the urban ecosystem. The river is re-engaged as an important feature of the urban environment and is thus revealed as being important ecologically, though also as an integral part of that now human-focused environment.

Emotion, linked to memory retention and recall, is recognised as an important element for learning. Immersion has been recognised to allow emotional attachment to a time or place (Venkateshwarlu, 2011), so on application appears to increase potential learning through experience of place.

In the creation of an immersion environment a number of factors are viewed as important. Whilst the following factors are based on texts by Coe (1994) and Bierlein (2003) that focused on animal habitats, they can be equally applied to human habitats; it is the educational principles underlying the theory that are of interest.

Simulation: The simulation of landscapes of immersion should reflect the specific environment, habitat or ecosystem in question.
Continuity and Consistency: Users should feel as though they are actually within the habitat in question - the connections they make through the immersion need to be genuine and not detracted from by elements inconsistent with the demonstrated environment.

In providing immersive environments Coe (1994) notes that there should be a focus on hierarchy, meaning that the important ideas portrayed are emphasised. The landscape can 'borrow' appropriate views and backgrounds in order to extend its location beyond the immediate and the interrelation of relevant displays, concepts or processes can be provided via site layout and hierarchy, allowing visual and/or physical access to relating areas.

Acclimatisation as a landscape based theory is similar to landscape immersion, through which one is implicitly involved in and sensitised to their environment (Van Matre, 1974, 1989). Described by Steve Van Matre - it involves a *"...breaking down of the barriers to the point where one human being can feel himself not only completely surrounded by his environment, but totally involved with it..."* (1989, p. 11). Acclimatisation makes use of the senses and like immersion focuses on emotional attachment to place or 'nature' through involvement and experience in one's environment (Van Matre, 1989). He further describes the essence of acclimatisation and its application in education:

What do we care if the camper fails to remember the name of a wildflower? Does he remember its fragrance, the texture of its leaves...what lives in its community? ...not because someone told him he should know, but because for him it is a thing of enjoyment and beauty?
(Van Matre, 1989, p. 2).

Participants in environments that manifest principles of acclimatisation are encouraged to understand, enjoy and recognise the specific characteristics of the environment they are experiencing. Participants of immersive environments are presented with opportunities to deeply experience landscapes that often exhibit authentic elements. Two examples are provided on pages 23-24 that appear to manifest these theories in landscape design. They are the 'ChonGae Canal Point Source Park', South Korea and 'The Red Ribbon, Tanghe River Park', China. Both designs encompass the experiential principles of immersion and acclimatisation; and both promote appreciation and the sustainability of the local environment.

ChonGae Canal Point Source Park

The ChonGae waterway once flowed through Seoul, South Korea. However over time the river became a dumping ground for waste, ruining a feature of the environment that once was the pride of the local people. The waterway became a place of poverty - the location of slums. It flooded frequently, meaning unsanitary water was spilled into nearby neighborhoods. The ChonGae was subsequently piped underground and on top was built a highway. The year 2003 saw re-connection of the people of Seoul with the ChonGae (figure 2-3). A section of highway was removed and the waterway was uncovered. A design was implemented that focused on restoration of the waterway into an urban public space that would also act as an improvement site for the city's water. As well as having many environmental and economic values, the design features of the park allow people to reunite with the water and environment that was once a big part of their culture and lifestyle (figures 2-4 and 2-5). Stepped stones (figure 2-4) highlight fluctuation of the water levels, aiming to educate the users on local water conditions, while the restoration of seven miles of the stream corridor has created an increase in local wildlife (American Society of Landscape Architects, 2011a).

In all, the ChonGae Canal Point Source Park today provides a place of value to the people of Seoul. It is a place in which residents can be immersed and importantly re-learn the value of their natural resource.

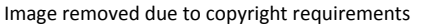


Figure 2-3: *"ASLA 2009 Professional Awards | Sunken Stone Garden"* (Gardener.Ru, 2012)
The stream brought back to life for residents to appreciate and cherish

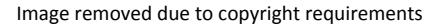


Figure 2-4: *"ASLA 2009 Professional Awards | Sunken Stone Garden"* (Gardener.Ru, 2012)
Central city immersion: Children and adults alike access
and enjoy the water that has been returned to the city

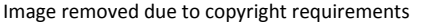


Figure 2-5: (Carolyn, 2011)
The Park in its nighttime glory: A valuable asset to the city in many ways

The Red Ribbon, Tanghe River Park

Tanghe River Park is a twenty-hectare park and a place of lush habitat. It was once inter-dispersed with dumping sites and slums – a site otherwise inaccessible due to the areas dense vegetation. On the verge of development into hardscape and flowerbeds, the park was luckily recognised as an important resource for use by surrounding communities. The less ecologically invasive design of a 'Red Ribbon' running five hundred metres through the vegetation saved the park from hardscape development (figure 2-6). Punctuated with lighting, planting and informational pavilions (figures 2-7 & 2-8), the park has become an easily accessible leisure-based landscape. Users are encouraged to notice and appreciate the surrounding natural ecosystem and landscape by way of a boardwalk accompanies the 'Red Ribbon' on its journey along the Tanghe River. The designer, leading Chinese Landscape Architect Yu Kongjian believes that *"... it really helps preserve the site's natural ecological systems by artfully framing the surrounding ecology to visitors. The Red Ribbon also supports more sustainable use of the landscape through meandering boardwalks and bike paths"* (American Society of Landscape Architects, 2011b).

Whilst the park can also be recognised as immersive, it importantly allows one to become acclimatised to a place of beauty that is also a place of ecological significance; likely influencing users to advocate for the further positive use of their surrounding natural landscape.

Image removed due to copyright requirements

Figure 2-6: (Dave, 2008)
Designed to allow its users to experience the beauty of nature and maintain their connection with rural China

Image removed due to copyright requirements

Figure 2-7: (Dave, 2008)
"Design can use cultural values and traditions for the appearance of landscape to place ecological function in a recognizable context..." (Nassauer, 1995, p. Abstract)

Image removed due to copyright requirements

Figure 2-8: (Dave, 2008)
A contemporary introduction goes a long way to encourage recognition of and enjoyment within an historic eco-system

These examples work at multiple levels to aid in user learning. Both support learning through their influence on emotion by making accessible and promoting positive use of a valuable local resource. Both demonstrate local relevance to their place of design, an important factor in learning as discussed earlier. And, both make use of sensory elements through which recollection of the positive experience is encouraged.

Designer understanding of the theories of immersion and acclimatisation and the application of their principles in design may lead to designs that may enhance user appreciation and understanding of their surroundings. Employed to support sustainable learning objectives, the result may be enhanced public understanding of sustainable ideas and values.

Place specific design and sense of place

Our eyes do not divide us from the world, but unite us with it…Let us then abandon the simplicity of separation and give unity its due. Let us abandon the self-mutilation which has been our way and give expression to the potential harmony of man – nature
(McHarg, I. 1969, p. 173)

A sustainable future calls for unity of man and nature just as it calls for a change in the perception of ones relationship with their environment. Not only does renowned writer in environmental planning Ian McHarg (1969) assert the need to design with nature, but also that this unity requires a change in the way one values their own environment. As discussed earlier in this literature review, a change in disposition is the goal of an educator, suggesting that the missing link between value change and sustainability could be education. To educate on, and therefore minimise separation of man and the environment calls for attachment to place. Landscape Architectural theory often makes reference to this attachment, highlighting another link to its potentials in education, which will be discussed below.

The concept of Genius Loci, coined by the ancient Greeks, forms the basis of place and locality in design. It is a theory that responds to the inherent spirit of place and the creation of a sense of place and has been supported by the likes of Ian McHarg and urban planning theorist Patrick Geddes (Turner, n.d.). The term has been superseded by the development of terms such as sense of place, placelessness (Cresswell, 2005; Relph, 1976) and critical regionalism (Frampton, 1983; Tzonis & Lefaivre, 1981). However, like Genius Loci the terms support the need for designs to be adapted to the context in which they are located; for the site to reveal appropriate and meaningful design in its own way (Treib, 1995) to provide a basis from which positive attachment to place can be encouraged. Effective education and educational environments rely in part on relevance to the student, an idea supported through place-specific design. Place-specific design promotes attachment to place and consequently supports changes to mindsets and behaviours. Furthermore, it promotes the spreading of those mindsets and enables feelings of ownership through local communal engagement (Byrch, et al., 2009). Building on this in *Ecological Design, Urban Places and the Culture of Sustainability,* Eisenstein (2001), writes of the use of meaningful and interpretable design within different communities. He believes that the implicit nature of locally recognisable design allows the formation of place value to emerge for a community. In turn, the relationship and sense of ownership many have with their greater environment (and subsequently the ways in which they communally treat it) may be enhanced.

Design could be implemented to affect these areas. People who demonstrate an enhanced attachment to and treatment of their landscape may have undertaken a sustainability-focussed learning process that was influenced by the designed landscape.

Landscape narrative

A picture is worth a thousand words
(Source unknown)

Landscapes have a *"…very human capacity and penchant for telling stories"* (Potteiger & Purinton, 1998, p. 23). They can paint a picture of the past, present

or future so provide many possibilities in the sharing of information. Employing landscape narrative in design therefore provides potential access to knowledge and experience (Chang, Bisgrove, & Liao, 2008; Potteiger & Purinton, 1998); so narrative possesses learning values and potentials. Landscape narratives are generally employed under one of two categories: explicitly designed storytelling landscapes – conveying messages of collective human memory, or landscapes with implicit narrative value – narrative inscribed by natural process and cultural practice (Potteiger & Purinton, 1998; Rakatansky, 1992).

The ways in which narratives have been expressed or stories told and the reasons behind them have developed over time – narrative ranges from 'scribing stories' to establish place, to the demonstration of mans' domination over nature; framing views in the picturesque period saw narrative treating the wider landscape as little more than scenery (Gortz-Reaves, 2010). Contemporary practice however is developing the use of landscape narrative to improve the man-environment relationship. An example is the man-nature narrative qualities of the evolving practice of Eco-revelatory design (refer to page 27) whose use of landscape narrative is viewed as a cultural transition from a model of dominance to one of partnership with nature; shifting landscape narrative towards mans' responsibility to nature (Gortz-Reaves, 2010). In employing this technique in the landscape one needs to understand that *"Landscape not only locates or serves as background setting for stories, but is itself a changing, eventful figure and process that engenders stories"* (Potteiger & Purinton, 1998, p. 6). Asserted here is that the landscape as a place of narrative does more than just reveal a story (what is told) - it is also the means of telling that story.

In understanding the learning potential landscape narrative holds, one needs to look no further than Potteiger and Purinton's assertion that *"We come to know a place because we know its stories"* (1998, p. 6). Through deciphering stories and subsequently 'knowing place' one has been actively involved (Kerka, 2002; McInerney & McInerney, 2010) and will have formed some kind of emotional attachment (Lackney, 1998) so has entered the realm of learning described earlier. Kimberly Gortz-Reaves' paper *Eco-Revelatory Design: A Model for Landscape Architecture to Resolve, Reveal and Educate in the Lower Fountain Creek Corridor* (2010), sums up the learning benefit of landscape narrative: "*If* [we are] *successful in conveying the new ecological narrative the...conclusion to this story will be society gaining an ecological literacy which will foster a consciousness of our environment and living intimately with it"* (Gortz-Reaves, 2010, p. 32).

As this section has discussed, the development of landscape narrative toward the man-nature relationship is furthering the potential of landscape narrative as a tool in Learning for Sustainability.

Site lay-out/ organisation

Whilst one may focus on the specific theories and practices active at the scale of the designed site, it is important to note that the way in which a design is situated within the city also has a bearing on its potential educational outcome. Frey (1999) in *Designing the City: Towards a more sustainable urban form* indicates that for a sustainable design to be of relevance to the wider environment it must *"...contribute on a strategic level to land-use and city region's...form and structure"* (p. 21). In successfully doing so, Frey believes the design could aid in the development of a set of conditions for the surrounding district(s) to design by. Frey (1999) suggests that there are three primary levels that must be considered when planning and designing for a sustainable outcome: the Regional level, the District level and the Individual level. Each of which seem to signify a greater connection to place. He indicates that achieving this will enable the values of sustainable design to be more coherent and meaningful across the board and supports the repetition of sustainable ideas and the linking of them to placeto aid in memory retention (Frey, 1999).

In designing for Learning for Sustainability, by ensuring the ideas of one site link with ideas manifest in the wider landscape the potential for the uptake of information and understanding/coherency of site could be improved.

Eco revelatory design

Eco-revelatory design is possibly the most recent and progressive spatial design style through which learning outcomes with regard to the environment are sought. The first Eco-revelatory design exhibition, *Eco-Revelatory Design: Nature Constructed/Nature Revealed* was organised by Brenda Brown, Terry Harkness and Doug Johnston and spanned from 1998 to 2000. It is a spatial design technique employed in current Landscape Architectural practice that displays strong links to sustainability education within the landscape. Eco-revelatory design is a design style that intentionally reveals ecological phenomena (Liverman, 2007) to highlight specific aspects of a site that *"...are invisible or overlooked by designers and the public..."* (Liverman, 2007, p. Abstract). The implicit values underlying those revelations are exposed to promote ecological awareness and allow the user an understanding of the complexities behind the site's functioning. Eco-revelatory design is the Landscape Architectural theory and practice that best supports Learning for Sustainability, as it helps to form appreciation of ones' environment and therefore encourages positive decision making for the future of those environs (Liverman, 2007).

The range of design possibilities presented within Eco-revelatory design is broad, ranging from the tangible improvements of sites (such as the treatment of wastewater (figure 2-10) to symbolic gestures (such as a path tracing the former existence of a stream) in which users are reminded of the pre development conditions of a site (B Brown, 1998; Eisenstein, 2001). Aligning with the suggestion that context is important in education, Eco-revelatory design focuses on the exposure of processes of local significance (Blue+green Design Studio, 2010; B Brown, 1998; Eisenstein, 2001).

The following example of the Arcata Marsh and Wildlife Sanctuary illustrates an eco-revelatory design approach in which sustainability-based values are presented for local residents.

Arcata Marsh and Wildlife Sanctuary

In *Ecological Design, Urban Places and the Culture of Sustainability,* Eisenstein (2001) presents the Arcata Marsh and Wildlife Sanctuary, a constructed wetland on the shore of Humboldt Bay (California). The Sanctuary works as a secondary treatment plant for the city's sewerage water, a topic of local relevance, before discharge. The use of the wetland is primarily as an infrastructural service, and as shown in figures 2-9, 2-11 and 2-12 is a valuable recreational and cultural amenity.

Image removed due to copyright requirements

Figure 2-9: *"Arcata Marsh Trail Map"* (City of Arcata, 2012)

Image removed due to copyright requirements

Figure 2-10: (Humboldt State University, n.d.)
Eco-revelatory design treating wastewater, providing habitat and satisfying residents

Image removed due to copyright requirements

Figure 2-11: "*Observing the marsh"* (Friends of Arcata Marsh, n.d.)
Visitors read a signboard that supports their landscape experience

Image removed due to copyright requirements

Figure 2-12: (Unknown, n.d.)
A site not limited in function reaches many user groups

Key advocates for Eco-revelatory design such as William Eisenstein (2001, 2005), Brenda Brown, Terry Harkness and Doug Johnston (1998) believe designs such as the Arcata Marsh and Wildlife Sanctuary satisfy one of the most important purposes of design in public space – fostering human-environment connections in an increasingly unsustainable world. Eisenstein asserts that the technique reveals *"...ecological processes in the built environment* [so] *will allow human users of that environment to connect with, appreciate, and ultimately value those processes more than they otherwise would"* (Eisenstein, 2005, p. 2). While some may recognise its link to environmental design techniques proposed by the likes of Ian McHarg (1969) and Robert Thayer (1994; 1998), Eco-revelatory design delves deeper into the learning aspect of landscape design. It focuses on the ways in which occupants of an area may live more sustainably and *"how they might develop a greater understanding of the natural cycles that sustain all life, including their own"* (Eisenstein, 2001, p. 1). Supporter of the Eco-revelatory design theory, Eisenstein suggests an understanding of the learning values implicit in the landscape *"...will be critical to the prospects of sustainability"* (Eisenstein, 2001, p. 1); a suggestion that emphasises the value of Eco-revelatory design in the creation of landscapes with an improved experience-based design 'layer' making reference to Learning for Sustainability.

The theory of Eco-revelatory design shows recognition of the value of the landscape in learning, and is one of the only Landscape Architectural theories recorded in this research through which user environmental education is a goal. While the theory does not specifically relate to Learning for Sustainability, it is evident that it demonstrates strong potential to aid in this area. The educational principles of Eco-revelatory design appear to be lacking inclusion in many modern landscapes, highlighting an area for greater recognition in the future design of landscapes.

Sensory design and the choice of materials

Although the world's peoples vary greatly in terms of linguistic and cultural matrices, we do share...similar human senses...
(Treib, 1995, p. 101)

Human senses play an important role in self-directed learning. United with Treib's description that human senses are shared worldwide, the Landscape Architect is offered an opportunity to enhance multi-national learning within the designed landscape. The following discussion will highlight the ways in which sensory experience is influenced by material choice and the ways in which the use of sensory landscape design may increase the learning value of a landscape.

Many educational theorists and institutions support learning via the senses (Green Education Foundation, 2009; James & Bixler, 2008; McInerney & McInerney, 2010); a promotion of the hand-mind connection in which learning is a 'doing' experience rather than purely observational (Hainstock, 1997). Sensory learning is a technique that is effective for a wide range of people. Earlier discussion in this research has highlighted that the discipline of Landscape Architecture has a part to play in education regarding sustainability and as James and Bixler (2008) suggest *"...educators should enhance...areas...to increase opportunities for sensory experiences with nature"* (p. 57). Recognition that the senses aid in experiential learning in nature suggests that the Learning for Sustainability within the landscape could be enhanced by the utilisation of sensory stimulation.

Smells, as well as sights, sounds, tastes, and touches, can create rich and engaging educational environments... (Green Education Foundation, 2009)

The multitude of senses provide vast opportunities for stimulation in the learning landscape; the broad range of senses, coupled with a never ending choice of sensory materials - for hard or soft landscapes - holds the potential to further influence users' learning experience. Currently, sensory design is

often employed in specialist gardens or landscapes with specific purpose. For example sensory gardens for the elderly and disabled, landscapes for the blind, and children's playscapes designed specifically for sensory based learning. Figure 2-13 demonstrates a Primary School play area. The multitude of sensory stimulants that *"offer, physical, imaginative and open-ended play"* (Timotay Playscapes, 2011) were included to aid in understanding of the environment, and to develop physical and communication skills.

Image removed due to copyright requirements

Figure 2-13: *"Urban Inner City School – Grove"* (Timotay Playscapes, 2011)
Numerous surfaces, shapes and materials employed in this multisensory 'playscape'

A large number of school-scale sites were available as further exemplars, suggesting the applicability of sensory design to the learning landscape is already supported within these contexts.

Although *recognised* sensory learning in landscapes appears to be limited predominantly to the small scale, the recognition of sensory design with its influence on learning in the larger scale landscape and its potentials to cater for multi-national learning experiences is important if the Landscape Architect is to effectively apply this technique to the public landscape.

Sensory design could be considered and applied to the landscape at any design scale to enhance learning environments. By enhancing sensory connection as a part of a site's experience, especially through the choice of plants and materials, the Landscape Architect may encourage interactive learning among wider audiences, unbounded by language or cultural difference. Focusing on sensory stimulation that supports principles of sustainability may encourage landscape-based Learning for Sustainability.

Interpretation

This research focuses on interpretation as an explicit tool, consciously included within a site, for landscape-based education. These interpretative tools can be used to offer education or to suggest there is learning value in ones immediate landscape. They consist of the likes of guided or self-guided tours, or didactic[5] tools, such as signboards that *"...provoke revelation about a place, idea or object"* (Ehrlich, 2003). Interpretation tools are often employed as a part of the narrative landscape to aid in user understanding of the specific story (Chang, et al., 2008).

The practice of interpretation can range from the use of a signboard providing specific information, to 'original objects' that are intended to show or remind the viewer of the original use or occupation of a space (Tilden, 1977), such as a gold miners hut in a regenerated landscape that once functioned as a gold mine. Guided or self guided tours are also effective practices in interpretation

[5] Intended to instruct (Dictionary.com, 2009)

that are employed to explicitly instruct the user of a site (Chang, et al., 2008). As explained by the Harpers Ferry Centre Division of Interpretive Planning, *"The challenge* [of interpretative design]*...is to help visitors experience landscapes in beneficial, enjoyable, and sustainable ways, and help them relate experiences to more intangible values, meanings, and traditions"* (Division of Interpretive Planning, 1998, p. 45).

The combination of didactic interpretation strategies, along with first-hand experience is a way of including interpretation in the landscape - self-guided trails in association with plant labels and sign boards are an example of interpretational practice that enable the user to understand and relate their experiences to wider ideas and values (Chang, et al., 2008).

The practice and inclusion of interpretation in landscape design appears to support the uptake of meanings and experiences programmed into a site. Landscapes that include explicit methods of interpretation may contribute another layer to the landscape, better supporting user experience and Learning for Sustainability.

2.5 Experiential theories of education and learning

For one to embrace the theory explored around Landscape Architecture it is important that the relationship with the educational discipline, that also recognises links between the experience of ones landscape and learning, is developed. Two key theoretical techniques of education that appear to support this experience-based learning, and importantly, that make special reference to the landscape, are experiential education and non-verbal communication. These theories, which focus on the phenomena of human experience, have been identified as applicable to the realm of Landscape Architecture and design, and provide a deeper understanding regarding the link of the designed landscape to education. The two theories are discussed below.

Experiential Education

Tell me and I will forget. Show me and I may remember. Involve me and I will understand

'Chinese Proverb'
(Association for Experiential Education, 2007)

Whilst based in the theory of experiential education, this proverb may be manifest by the Landscape Architect in design. The landscape has already been established as a place of learning and of experience. Therefore the designer holds the potential to first introduce sustainability-focussed ideas to the landscape, and then encourage involvement and learning by allowing the user to actively experience those ideas.

Lackney (1998) suggested the need to create challenging yet thought provoking environments. He highlights the importance of memorable experience and shared learning opportunities in the creation of learning environments. Since the landscape is a place of experience, it is a place that lends itself to the influences of experiential education. The following will discuss the theory of experiential education and will highlight its relevance to the Landscape

Architect.

Experiential education is an educational theory that expresses the importance of experience in learning. It is believed to be an effective model for teaching in all contexts (Haugen, 2010) and according to the Association for Experiential Education(AEE) (2007) there are a number of key opportunities that should be used to structure experience and enhance learning. The AEE believe that in creating an effective learning experience, the learner needs to be able to take initiative and make decisions; they need to be actively involved in their environment and allowed to engage *"...intellectually, emotionally, socially, soulfully and/or physically"* (Association for Experiential Education, 2007). The environment needs to set up experience so that learners have a chance to learn (Bobilya & Daniel, 2011). The theory therefore reinforces the idea that ones landscape is full of implicit learning value. Emmelin (1976) however insists experience should not attempt to be a substitute for other forms of education, but rather provide a supportive environment that encourages experience and *reinforces* education (T. E. Smith & Knapp, 2011). This suggests that the experiential landscape that supports educational goals of wider disciplines, in this instance in sustainability, could be beneficial.

The Association for Experiential Education (2007) indicates that this theory is not focused solely on the learners themselves but on the relationships they can form with others and their world. It is clear therefore that the designer with an understanding of experiential education holds the potential to reach their 'students' beyond only the direct experience of the designed landscape. Suggested here, is through the educative involvement of users in the design *process* itself, alongside continued experience of the resulting landscape, could be beneficial to learning. That would especially help to promote an increased understanding of 'place' and environmental process that is critical to achieving a more sustainable future. Highlighted also is that a number of important encounters that promote education; *"...success, failure, adventure, risk-taking and uncertainty..."* (Association for Experiential Education, 2007) are encouraged in experiential education, as the outcome of experience cannot be predicted. This means the theory of experiential education is supporting Lackney (1998) in his beliefs regarding the importance of introducing levels of stress and comfort in constructive educational environments (albeit balanced proportionately). The Landscape Architect who understands their role as an 'educator' may therefore take on the role of 'experiential educator'. They may design suitable experiences and boundaries, and pose problems to be overcome within the landscape. Landscape is synonymous with everyday life experience, meaning that the canvas on which the designer is creating new or different environments is a place in which experiential education concerning sustainability could be readily applied.

Non-verbal communication

The landscape works in ways unrealised by the participant. Its influence, as discussed earlier, is implicitly educational. Learning, as also discussed is carried out over time and is reinforced as one undergoes multiple experiences that reinforce and reiterate learned ideas and values. The educational technique of non-verbal communication recognises the phenomena of experience in gathering information (Eisenstein, 2001; Mening, 1979; D. C. Smith, 2008) and so corresponds with the technique of experiential education described above. It speaks of the gathering of information via "*...non-verbal "messages" from the built environment in much the same way as we do when interacting with other people"* (Eisenstein, 2001, p. 2).

Design is the discipline that is concerned with organizing visual cues to bring clarity to visual perception. The way in which visual information is constructed, assembled and organized can greatly influence how it will be perceived or interpreted

(D. C. Smith, 2008, p. 32)

Smith's statement demonstrates the role of the designer as the creator of experiences to be had, and thus the provider of non-verbal cues. Joan Nassauer, Professor of Landscape Architecture, focusing on the relationship between aesthetics and ecology (1995, 1998), has developed a landscape-based concept 'cues to care' that supports non-verbal educational theory. It focuses on the meaning people derive from the landscape. Seeking to influence peoples' view

and understanding of sustainable landscapes through providing signals of design intent in sustainable, yet perceived 'messy', landscapes (Heatherington, 2007; Nassauer, 1995) is the focus of this applied technique. Heatherington (2007) and Nassauer (1995, 1997, 1998) explain that common application of the concept includes 'orderly frames' such as mown paths, neat edges, clipped hedges, formal boundaries and hard landscaping as borders to 'messy' ecosystems (Heatherington, 2007; Nassauer, 1998).

In understanding how people are further influenced by non-verbal attributes of the landscape one can look to explanations by Cullen (1961) and Smith (2008). They maintain that much of the information humans must process is that of the visual and that visual cues in part inform ones' navigation and movement through place. Gordon Cullen's (1961) well-known concept of 'serial visioning' (the (urban) landscape as a series of related spaces) indicates that a link is created with our environment as we establish a 'here and there' relationship; movement and use is influenced by visual cues (Cullen, 1961).

Further alignment of the non-verbal qualities of the designed landscape with the theory around learning discussed earlier, comes from Eisenstein who notes that the communication of ideas and enhancement of understanding is highly context dependent; the topic is of most relevance to those who can personally relate. The example of Arcata Marsh provided uses an Eco-revelatory design framework to communicate a non-verbal message. It exposes local users to the positive environmental impact this type of wetland can have on the greater natural environment, while supporting their everyday needs.

As this section has suggested, experiences in learning are key to reinforcing ideas and values. Recognition of the landscape's potential to communicate, albeit non-verbally, messages of sustainability, is important if the Landscape Architect is to support and enhance learning opportunities for sustainability through design.

2.6 Literature review summary

This chapter has brought to the forefront the highly influential value of experience in learning. The landscape is the place of experience and therefore a Landscape Architect is involved in offering and manipulating those experiences. It has offered an explanation of those experience-based learning theories and practices that are promoting implicit learning within landscapes or that can be explicitly provided for learning. Its aim was to identify the gap in current Landscape Architectural research and to start to generate potential ways in which the aforementioned theories and techniques could be applied as a design layer regarding Learning for Sustainability within the landscape. This review has shown that current literature does not formally recognise the influence of the designed landscape on Learning for Sustainability in Landscape Architectural discourse or practice, suggesting this is a relatively new or under-developed field of research. However, the uncovering of areas of Landscape Architecture that exercise educational promise along with a combination of educational principles, is a step toward understanding how the landscape affects users' Learning for Sustainability. Establishing that the process of design may also influence sustainability learning, this review has created a base from which this research can progress. The various theories and practices identified, and the ways in which they are manifest in the current landscape, will be explored through both collection and analysis of this study's results.

Chapter Three

Methodology

3.0 Introduction

The previous chapter has provided strong evidence that the landscape is an experiential aid to Learning for Sustainability. It has highlighted the need to transcend the use of individual theories and practices for learning, instead supporting the interrelationship and learning potentials provided by linking Landscape Architecture with the educational disciplines. This chapter will explain how that recognised interrelationship will be explored.

The aim of this research is to investigate the role of the designed landscape in learning for sustainability, providing an increased understanding of theoretical and practical site design techniques and strategies that can be utilised by the Landscape Architect to aid in this area. The methods employed will formalise the link between the Landscape Architectural discipline and Learning for Sustainability. It will explore both the landscape itself - identified in the previous chapters to possess implicit educational values - drawing on concepts from the academic realm of education, that can provide direction with regard to the possibilities and benefits of applying explicitly educational theory and practice within landscape design. Findings that support intersecting solutions recognising the interrelationships of implicit and explicit education, and that encourage a re-emergence of landscape-based learning should appear over the course of this research.

Focusing on those research questions posed in chapter one - 'How is learning for sustainability theorised, applied and implemented in the scholarship and practise of Landscape Architecture?' and 'How does the designed landscape direct learning outcomes in relation to ecological environmental sustainability?' - these findings will be sought. Whilst the initial focus of this thesis incorporates the study of educational theory, these questions seek to direct methods for future possibilities for the design-based discipline of Landscape Architecture. This chapter will describe the research methodology used, and its significance to this research. It focusses on:

- Case study method and field research strategy
- Phenomenology and the analysis of results

3.1 Case study research method

Introduction and description

Case study research is today a well-established and commonly applied method of enquiry utilised throughout numerous professions (Francis, 1999; Yin, 2009). This study seeks results pertaining to user experience of implemented landscapes, exploring the interrelationships of both explicit educational practices and those implicit learning values within the landscape. Mark Francis, Professor of Landscape Architecture at the University of California, Davis, highlights the case study method as particularly useful in experience-focussed studies. He deems case studies appropriate in Landscape Architecture *"...where real world context tends to make more controlled empirical study difficult"*(Francis, 1999, p. 13). Robert Yin, author in the field of case study research, supports the applicability of case studies to disciplines such as Landscape Architecture. He suggests that the method can *"retain holistic and meaningful characteristics of real life situations"* (Yin, 1994, p. 3). Such is the need for research that explores both real life experience and theory as one. Though critics suggest dependence on a single case will mean the result is ill-supported generalised conclusions and unreliable findings (Davis, 2009; Tellis, 1997), Yin asserts that as long as the case study(s) establish and accomplish their certain objectives, results should be considered acceptable.

The literature suggests that case studies are not limited to one single methodology. Obtaining results that consult both the real life and the theoretical realm therefore requires the selection of a case study method that ensures rigorous research could be undertaken. Several examples of case study methodology are introduced by Winston Tellis (1997) in his article *Introduction to case study* – supporting different research goals. Yin highlights three key case study methodologies - *exploratory, explanatory* and *descriptive.*

Exploratory case studies require creation previous to undertaking research. These studies explore a set of pre-determined objectives. Many employ a pilot study to determine procedures to be used throughout the duration of the research; *Explanatory* case studies are beneficial if results are to be causal - if an explanation of patterns and complex or multivariate answers are likely to be required; and *Descriptive* cases focus on a theory driven hypothesis. They are employed when cause-effect relationships are likely results.

The research undertaken in this thesis follows the *exploratory* case study method. A set of objectives was determined parallel to an informative literature review, and prior to on-site research being undertaken.

The selection of case study sites

With an understanding of the relevance of the case study method, the question of case selection arises. Yin (1994, 2009) and Tellis (1997) support the notion that multiple cases included within one study will strengthen the results and will provide greater depth for comparative analysis, suggesting that multiple sites are required for this research. Below is highlighted the importance of context and applicability in choosing multiple cases (sites')[1] that are capable of exploring the research objectives.

Following selection of the correct method of case study research, cases for study must then be selected. As Deming and Swaffield (2011) suggest, inquiry by exploratory case study methodology requires context and that context relies on the set of objectives to be accomplished (Yin, 1994). Sites selected for landscape-based research should therefore be bound by a set of parameters such as (but not limited to), scale, context, site focus, use and style. The intention is that parameters in selection should allow results that best meet the objectives.

Case study research that requires multiple cases should follow a 'replication logic', meaning that each case *"...consists of a "whole" study, in which facts are gathered from various sources and conclusions drawn on those facts"* (Tellis, 1997). This means that those cases should follow methodology that allows the depth of their results to be similar, and allows their applicability to each other, so will be capable of providing relevant answers regarding the same topic or

[1] The term 'sites' is used in place of 'case' when making reference to landscape based case study sites.

set of base objectives for later comparison (Tellis, 1997). This is reinforcing the requirement of those parameters to be set prior to selecting cases.

This section has explored the requirements for selection of cases for study. It has suggested that multiple cases are preferred, though are not imperative and that cases chosen should be able to provide results that satisfy the research objectives. Chapter four explains the choice of sites for this research. On selection of appropriate sites for research, a strategy through which results can be collected is required. The next section discusses the field research strategy that will provide results that relate to the focus of this research - the phenomenon of experience.

3.2 Field research strategy

With an understanding of case study research and the selection of cases, one can then look to the undertaking of that research in the field. Field research requires a research strategy. On review of literature, two strategies emerge as useful for research seeking responses to the phenomenon of experience: 'interpretive' and 'descriptive' strategies. Deming and Swaffield (2011) support the use of both 'interpretive' and 'descriptive' strategies in field research, which will be discussed below.

An interpretive approach is commonly employed when people and their social relationships are to be investigated (Deming & Swaffield, 2011); and a descriptive strategy is suited to the exploration of areas to "*…build up applied knowledge in support of…professional activities*" (Deming & Swaffield, 2011, p. 65). One may recognise here that a case study that employs both strategies may obtain results regarding both the phenomena of personal experience in learning (interpretive) and the applicability of those responses to the discipline in question (descriptive).

This thesis applies the method of case study research in the collection of a wide range of data. The interpretive approach has directed the collection of results toward the use of on-site interviews that gather user-focussed response. And descriptive strategy has highlighted that sites of contextual significance to field of the Landscape Architecture are required. Resulting is the collection of data and responses that are contextual, and can satisfy the research aims and objectives.

The following section will illustrate how this research has applied the above methodology. It will outline the process through which this research's results were obtained and analysed.

3.3 Application of research method

This research focuses on the phenomenology of user experience so exploratory case study research was undertaken. The contextual focus of case study research, along with the possibility of user-focussed response, permits the collection of data that is an authentic representation user experience. Case studies are applied in this research to reveal aspects of implemented designs that influence the learning for sustainability of site users. For in-depth interpretation of the results, phenomenology was applied as a tool for analysis (refer to figure 4-1, pg 44).

To explore the phenomenon of landscape experience in Learning for Sustainability two sites located in New Zealand were selected. In order to maximise consistency, the possibility of comparison, and therefore accuracy of the results, those sites were selected by means of a number of parameters. Parameters were decided upon that support the earlier referenced research of Yin (1994). They were: sites must focus on the phenomena of landscape experience; be of similar scale; and sites must focus on a common subject to provide context, though must be differing in design style. Selection of sites is discussed further in chapter four.

The following section illustrates the process followed for data collection, and explains the analysis of that data.

Key informant interviews

Case study research requires an in-depth understanding about the background of the case (Tellis, 1997) – for this research, an understanding of the background and the design intent of the sites. Key informants are widely accepted to be of use in beginning this understanding (Elmendorf & Luloff, 2006; Ricehoppers, n.d; Tellis, 1997; UNICEF, n.d). A 'key informant' is a person who can provide an opinion and information regarding the site (or issue) in question, and is usually someone particularly knowledgeable regarding the site (or issue) in question (Ricehoppers, n.d; UNICEF, n.d). Key informant interviews are regarded as an important aspect of research that *"...provides a source of...data presented in local persons' words and expressions..."* (Elmendorf & Luloff, 2006, p. 54).
To provide contextual background information prior to interviewing those people directly related to the sites, four interviews were conducted with 'key informants'. These were employed to up-skill the researcher on the issues around which further research-based enquires would be made. Key informants included a Landscape Architect who regularly partakes in school designs, a Landscape Architect who focuses on designs for sustainability, a professional highly involved with sustainability-focused groups in the community such as Lincoln Envirotown, and a professional who is in charge of environmental learning programmes at the Christchurch botanic gardens. On completion of these interviews, a face-to-face interview was then conducted with a 'key informant' from each of the case study sites. In both cases the key informant was involved in the management and/or design of the site: a Landscape Architect involved in the design of Waitangi Park and the long-term owner of Paradise Valley Springs who has consistently been involved in its development process.

Site observation and review of media

Case studies require multiple sources of evidence (Deming & Swaffield, 2011; Yin, 2009). Yin (2009) suggests that observational evidence, and evidence from a review of media should be gathered in order to provide additional information about the site and topic to be analysed, supporting information gathered from the 'key informant'.

In order to satisfy the need for multiple sources of evidence, this study made use of direct observation at both sites along with a review of printed media. Observation highlighted movement patterns, and activities regularly performed on site, and made apparent popular or well-used areas. The weather at the time of initial observation at both sites was inclement meaning that numerous additional (shorter) visits were undertaken that supplied the researcher supporting information to the initial findings. Site observation offered the researcher an informed understanding of the sites and their design, and contributed to the researcher's choice of interview locations. A review of

site-related media, including predominantly web-based literature, outlined the historical context and wider uses and issues surrounding each site and contributed to the researcher's comprehension of the sites.

On-site interviews with public participants

On-site, semi-focused interviews with site users were employed to further explore the results of the extensive review of literature, site research and observation. They exposed the principles that appeared to be influencing learning for sustainability at each site.

"To gain an understanding of the meanings attributed to particular experiences in the real world qualitative researchers employ data collection methods conducive to collecting verbal data elicited through an interview" (Griffiths, 2009, p. 43).

Interviews are an important technique used in case study research seeking an understanding of personal experience (Griffiths, 2009; Merton & Kendall, 1946; Yin, 2009). The researcher, having already analysed the sites is able to explore the research objectives by way of interviewing users/visitors (Merton & Kendall, 1946), with the aim *"...to* ***understand*** *the respondent's point of view..."* (Sociology Central, n.d, p. 1). Yin (2009) suggests that interviews used within case study research are conversations guided toward a 'consistent line of enquiry'. In cases with differing features, questions may be left 'open' to allow the researcher to further explore participant response.

The interviews conducted onsite were intended to gain an insight into the user experience and how that experience affected their learning. Questions were therefore geared toward experience-based learning (with regard to sustainability) via use of the New Zealand based sites. The aim was that the questions would provide a response that would enable a comparison of how the visitor used, understood and consequently valued aspects of the site, which could be followed by analysis of how that may have affected their learning. The result would be an increased understanding of the Landscape Architect for the potential application of landscape-based learning techniques to sites with similar characteristics.

Interviews at each site followed a replicated interview structure and question base. However as each site was designed through a different process, resulting in differing aesthetic style and functional use, specific questions geared toward those features were required. For this reason, although Tellis (1997) suggests the need for 'replication' of methodologies across all cases, each set of interviews allocated special attention to specific details. The openness of those questions allowed a broader perspective and exploration of aspects of the site that were influencing learning for sustainability.

Interview questions

Question's that explore and promote responses relevant to the objective of this research were required for on-site interviews. For this study the phenomena of experience was the primary area of exploration. For that reason questions surrounding participant use of site, understanding of site, and the aspects of site to which they place value were explored.

A questionnaire (appendix 3-1) was also included to provide basic personal information about each participant, allowing the researcher to find commonalities and differences between the sites' user groups, which would be considered alongside analysis of the data collected.

Participant selection

As stated by Kruger (1988) and supported in Deming & Swaffield, (2011) participants should be chosen who *"have had experiences relating to the phenomenon to be researched" (Kruger, 1988, p. 150).* For this research, participants were engaged if they were present on site at the time of interview. Participants were selected by way of 'intercept' and 'opportunistic' selection (Deming & Swaffield, 2011; Market Street Research, 2004) meaning participants were intercepted with the experience of site fresh in their mind. Those intercepted who were willing to spend time to answer were included.

The prospective participant had the option to accept or decline the offer of inclusion.

Informed consent (appendix 3-2) was required from each participant (Holloway, 1997; Kvale, 1996), and a 'Research Information Sheet' (RIS) (appendix 3-3) was provided to each prospective participant outlining what was required from him or her as a participant in this research. Participants were required to be 16 years and older for the purposes of lawful consent. Participants selected were not to be involved in the Primary, Secondary or Tertiary schooling system as they would have had the potential to skew research results due to their prior involvement in a system that has actively incorporated sustainability-based learning for some time. While the RIS explained these parameters, if the respondent questioned their ineligibility, the reasons were explained in detail. Initial conversation with participants regarding age and inclusion in the educational system highlighted English language competence, another of the pre-requisites to participate in the research. Each participant was required to speak competent English and have the ability to provide in-depth answers to the researcher. Those approached who seemed to have problems with the language were shown the interview questions and asked whether they would feel comfortable answering them. They were able to decide whether or not they were able to participate.

Interview locations

The selection of interview locations was driven by the need for users to be/have been experiencing the sites. The initially selected interview points (appendix 3-4) were a result of direct observation that indicated where users were likely to be located. At Paradise Valley Springs users were approached at the end of their visit - near the park's exit. At Waitangi Park the location was selected as it was on a path of high use, as determined in observation.

3.4 Phenomenology: a tool for interpretive analysis

The preferred strategy for analysing case study research is believed to be that of allowing the findings of the preliminary research to guide the researcher to the best method of interpretation that will permit objectives to be met (Yin, 2009).

Phenomenology as a tool was deemed appropriate for analysing the case studies of this research. Its use is discussed below.

Interpretive analysis proposes the researcher *"...actively engage in "making sense" of the phenomena they encounter"* (Deming & Swaffield, 2011, p. 152). The theoretical propositions that led to the study should provide the grounds for analysis of those encountered phenomena (Yin, 2009). For this study, extensive research into the background of Landscape Architecture and learning led to the realisation that landscape-based learning was affected by the phenomena of experience. The landscape was also found to hold implicit and explicit values for learning. Interpretive analysis using the tool of phenomenology was therefore deemed appropriate due to the experiential focus of this research. As suggested by Deming and Swaffield (2011) results were categorised site-by-site on analysis. Refer to figure 4-1, page 44 for diagrammatic explanation.

3.5 Methodology Summary

This chapter has highlighted the relevance of case study research to this thesis. It has discussed the applicability of phenomenology as a tool for analysis through its focus on human experience. This methodological approach to data gathering and analysis has enabled the drawing out of what is important about the site in terms of people's experience, and their understanding of the site through first-hand site experience. The results of this applied methodology are presented in the following chapter.

Chapter Four

Results

4.0 Introduction

This research set out to answer two questions: 'How is Learning for Sustainability theorised, applied and implemented in the scholarship and practice of Landscape Architecture?' and; 'How does the designed landscape direct learning outcomes in relation to ecological environmental sustainability?' So far this thesis has discussed the first question – it has identified seven Landscape Architectural theories and practices that show learning opportunities in the designed landscape, and has highlighted that the Landscape Architectural discipline has a link with the educational discipline through the realm of experience. It has identified two of the key explicit experiential learning theories of education that may provide learning opportunities if understood and applied in design.

This chapter will explore the second question, presenting the results of two New Zealand case studies and exposing points for further discussion relating to the ways in which the designed landscape could affect users' Learning for Sustainability.

This research set out to obtain results according to the methodological process described in chapter three. However it was necessary to provide participants at Waitangi Park with sufficient information to understand the functions of the site to allow the participants to enter, with greater depth, into a discussion regarding their experience of the site. All information provided was publically accessible.

It has become apparent through the data gathering process that a number of educational theories and practices discussed within chapter two are active in the case study sites of this research, such as immersion and acclimatisation, place specific design and sense of place, landscape narrative, site lay-out/ organisation, eco revelatory design, sensory design and the choice of materials, and interpretation. Some implicit in their existence and in their process of affecting learning - working on the subconscious level of the user, whilst others are explicitly employed for education and are affecting the users' conscious learning experiences. These site-based learning experiences are revealed by interpretation of the results in three key phenomenological areas – 'The World'; the 'Essence' of experience; and the contributions of those experiences to peoples 'Lifeworld'**.**

This chapter starts by giving a brief introduction to the three phenomenological areas and how they are utilised and applied to the analysis of results, and it then presents the results[1] of this case study research.

[1] All quotations marked 'personal communication' are from interviewees (participants) at the case study sites. See chapter three, methodology, for participant selection.

4.1 Application of phenomenology to this research

Phenomenology provides a tool through which this research can draw out experiential influences and possibilities in Learning for Sustainability via the designed landscape. The following is a brief explanation of what is analysed under each of the three phenomenological areas.

'The World': Objects of consciousness and Acts of consciousness

'The World' in phenomenology is comprised of both objects of consciousness and acts of consciousness. Accordingly, this research has explored the designed landscape, which incorporates both of these aspects. The 'objects of consciousness' are the sites of study and its design intent. The 'acts of consciousness' are the user-perceived uses for the site according to their needs and understandings. For example, visitors to Waitangi Park bring with them intentions for visiting. Whether those intentions coincide with the design intent or are a result of the visitors' own desires for use, those reasons demonstrate how the participants in this research perceive and consciously make use of the site.

'Essence': Implicit and Explicit

The 'Essence' explores those aspects that are important to the creation of experience in 'The World'. The essence of experience in landscape-based learning appears to incorporate implicit (those theories and practices that provide a learning experience that works at the subconscious level) and explicit (those publically recognisable cues that are specifically employed to educate) learning. Both the implicit and explicit findings that have emerged from the participant interviews are discussed for each site.

'Lifeworld': Understanding and Value

The 'Lifeworld' is the flow-on affect of experience, which will in turn affect further experiences. For this study, the flow-on affect[2] of the implicit and explicit techniques has been the influence of the designed landscape's use on user understanding and value of both sustainability ideas, and aspects of the landscape that support sustainability.

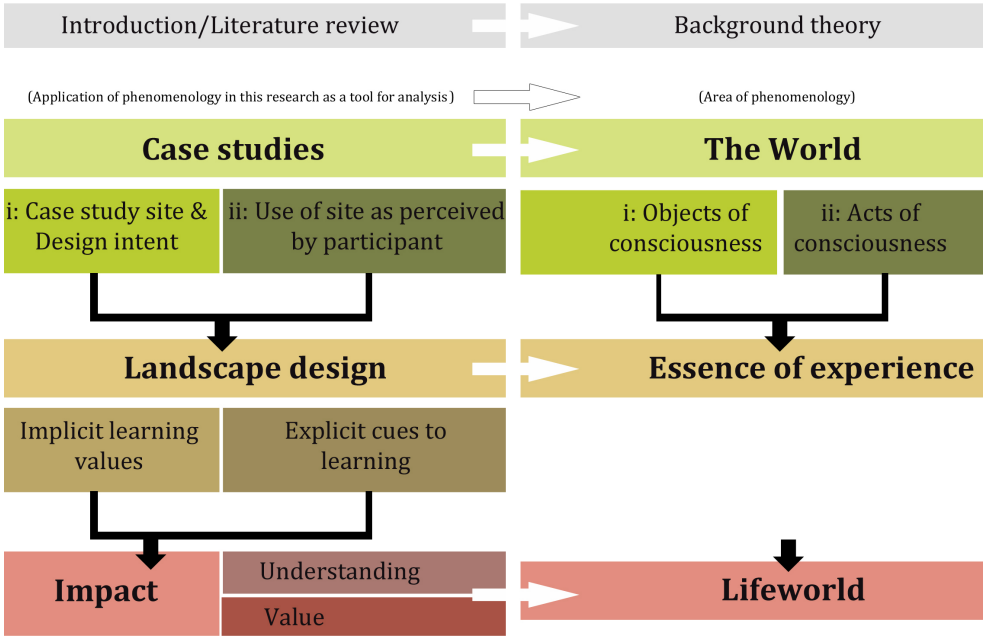


Figure 4-1 Diagram demonstrating how phenomenology is used as a tool for analysis in this research (Robinson, D, 2012)

Summary

This section has reiterated the application of the phenomenological tool of analysis for this research. The following sections apply the phenomenological tool for analysis. Firstly providing an explanation of how the case study sites were selected and offering an introduction to the study sites (The World). Then describing the on site experiences that appear to be influential in participant learning (Essence), and finally presenting the sustainability-based understandings and values influenced by those experiences (Lifeworld).

[2] For this research: The affect on user knowledge regarding sustainability

4.2 Case study site selection

As has been discussed in this research, Learning for Sustainability in Landscape Architecture is an area not formally recognised in literature, or understood with relation to actual designed landscapes. Because of which, an investigation of designed sites is a potentially important way to further explore and create this understanding. Sites for inclusion required selection criteria that are discussed below.

As this work is particularly interested in techniques that go 'beyond the signboard' – to further understand and recognise the implicit and explicit learning values of designed landscapes - the case study sites needed to be designs not relying solely on signage to provide learning opportunities. Also, scale is recognised to affect the 'human perceptible realm' - the human relationship with and understanding of the landscape (Gobster, Nassauer, Daniel, & Fry, 2007) - so a dramatic change in scale may affect the outcome and consequently the accuracy of results. Sites were therefore required to be of similar designed scale to minimise this possibility.

Cases for study should also be contextual and each should be able to apply a replication of methodology. Sites selected therefore required a common context, in this case the topic of Learning for Sustainability. Water, a significant landscape feature in New Zealand and around the world, is recognised as an important focus in the field of sustainability (Hansen, 1998; Hopkins, 2009; Merchant, 1998; Royal Botanic Gardens Melbourne, 2011; Thayer, 1998). Robert Thayer observes that it is a common feature of the designed landscape: *"...water...[is] the most expressive and accessible ecosystem component typically engaged by landscape architects"* (1998, p. 118), signalling that it holds learning value. In doing so he presents a topic of current interest that is considered often in Landscape Architectural design, therefore it became a suitable selection criteria for this research. A distinct focus on or around the subject of water and the sustainability of water-based systems was therefore a key requirement in the selection of case study sites for this research.

Case study sites

Waitangi Park, in Wellington, and Paradise Valley Springs, near Rotorua (figure 4-2), were selected as they both maintain a strong focus on the sustainability of water and water based systems. The scale of the sites are similar meaning they would allow virtually direct replication of research methodology. Revealed throughout the following results is that Waitangi Park is a place of implicit learning value, and that its influence on Learning for Sustainability is more so at the subconscious level of the participant. Paradise Valley Springs on the other hand is revealed as a site that effectively employs explicit learning cues that support its high implicit experience-based learning value. These characteristics are further revealed in the following sections.

With an understanding of the theoretical reasons for the selection of Waitangi Park and Paradise Valley Springs, the following sections can now introduce each site and then present the results gathered.

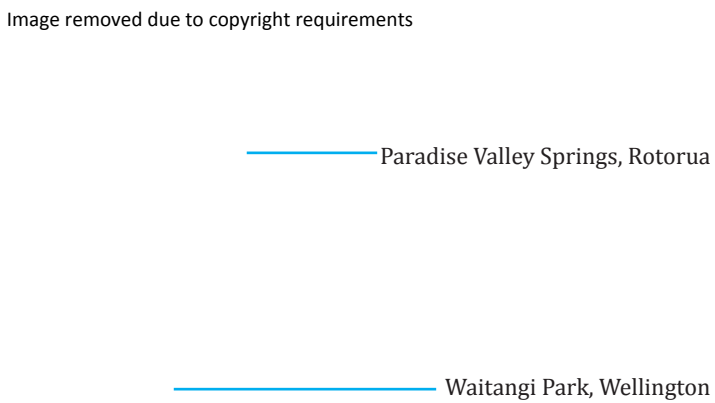


Figure 4-2: *'Blank outline map of North Island of New Zealand'* (Kahuroa, 2010)

Location of Waitangi Park and Paradise Valley Springs

4.3 Case study site 1: Waitangi Park

Objects of consciousness: the site

Waitangi Park is a public urban landscape designed by the Landscape Architecture and Urban Design firm Wraight and Associates Limited. It is located on the Wellington Waterfront (figure 4-3) in New Zealand's Capital City and has free access. Formerly known as Chaffers Park it is a place with a diverse history of both cultural and historical significance (Wellington Waterfront Ltd, 2004b).

The following provides a map of Waitangi Park, along with a pictorial guide to the site's features (figures 4-4 to 4-15), and then description of the Park.

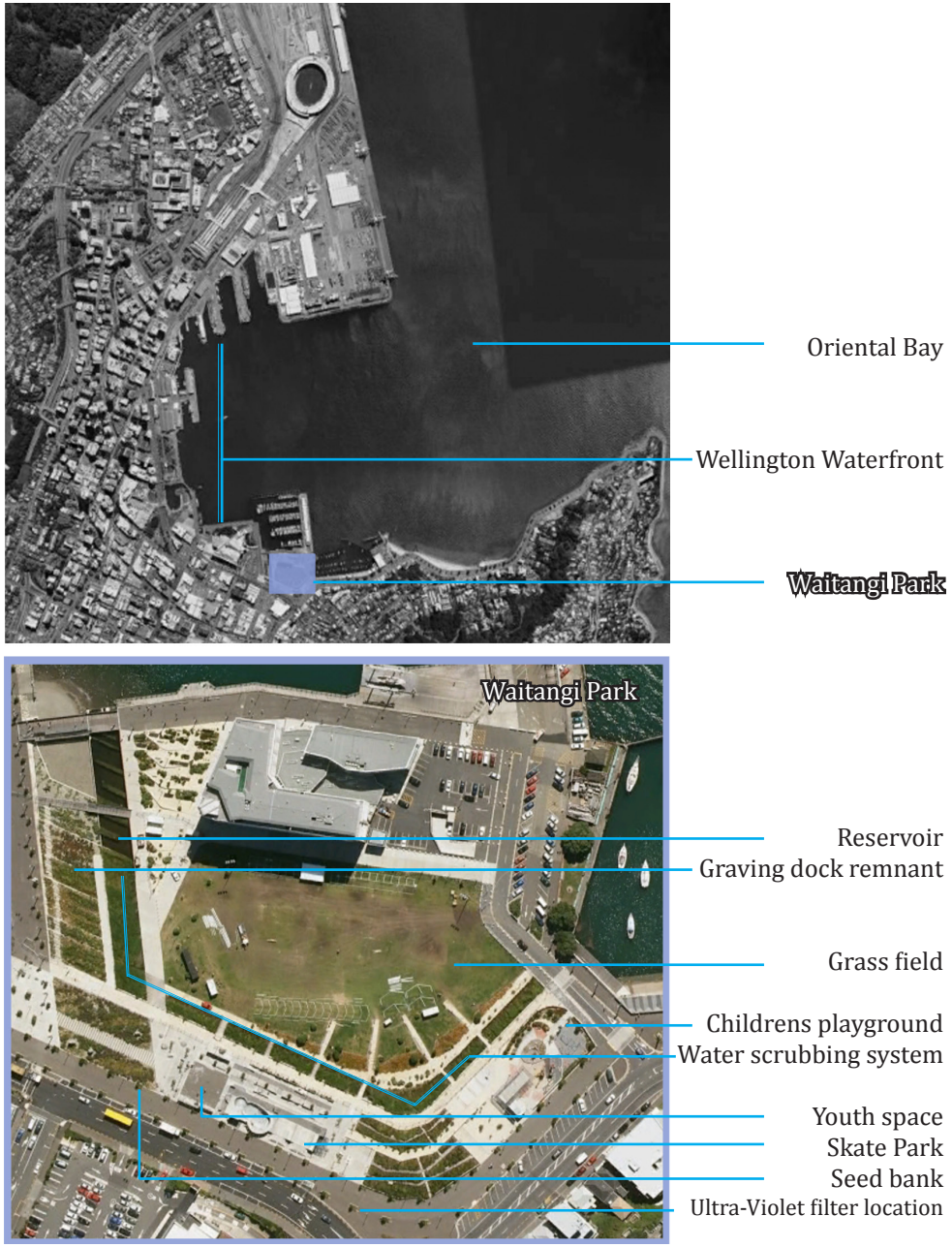


Figure 4-3: Waitangi Park location and features (NTS) (Google Earth, 2012)

Figure 4-4: Childrens playground

Figure 4-5: View into Park over scrubbing system from eastern site boundary

Figure 4-6: View along eastern site boundary to Chaffers Dock (Heard Street Post Office building)

Waitangi Park

Figure 4-7: View east alongside water scrubbing system, toward youth space

Figure 4-8: Water scrubbing system from location of Ultra-Violet filter

Figure 4-9: Pedestrian access across water scrubbing system

Figure 4-10: Skate park and youth space

Figure 4-11: Middle section of water-scrubbing system showing pedestrian access to water

Figure 4-12: View from youth space looking north-east to grass field

Figure 4-13: View west through seed bank via pedestrian walk-way.

Figure 4-14: 'Scrubbed' water reservoir

Figure 4-15: View south east across graving dock remnant and reservoir from north west boundary of Park

Figures 4-4 to 4-15 sourced from (Robinson, D. 2011, 2012)

Former water systems

Waitangi Stream and the Waitangi Lagoon, into which the stream fed, once comprised the waterways of the area. They were a key life source of the mana whenua. Maori (primarily people of Te Aro Pa) used the lagoon and stream as a source of fresh water, to launch their waka, and to gather from the plentiful kaimoana (Wellington Waterfront Ltd, 2004a, 2004b). The Park was given the name 'Waitangi Park' in remembrance of this key water resource.

The land and its uses

The area was uplifted in an earthquake in 1855 and subsequently underwent major land reclamations (Wellington Waterfront Ltd, 2004b). Waitangi Stream was piped underground during the reclamation. Following reclamation of the area, the site was used of in numerous ways. Use as a dog pound, city morgue, works department and bus park all feature in the site's history (Wellington Waterfront Ltd, 2004b). Waitangi Park was once also the site of the 'Wellington destructor' - an incinerator built to destroy ship's dunnage in the early 20th century (Wellington Waterfront Ltd, 2004b), and later was the site of a partly constructed graving dock, some of which still exists on site today (figure 4-15).

Objects of consciousness: the site's design intent

The design for six-hectare Waitangi Park was decided by way of a design competition. Wraight and Associates produced a design that encourages multiple user types, both local and foreign to the area. One of the site's designers suggests, *"...it's about cross-pollinating through the different groups and different demographics in users"* (Site designer, Personal communication, December, 2011). The site's focus was to recover and present some of its Maori cultural heritage and to re-expose to the public the water that was once an important life source of the area (Site designer, Personal communication, December, 2011). The intent was that the Park be useable in all seasons, with the few buildings to be specifically located to shelter users from the often harsh weather common to the site (New Zealand Institute of Landscape Architects, 2012; Wellington Waterfront Ltd, 2004e). While there was no express requirement for cleansing water or dealing with storm-water, the design looked to incorporate solutions to those popular and pressing issues of today's society. As *"...the city really lacks green space..."* (Site designer, personal communication, December, 2011), the resulting design intended to provide a green area to cater for large or small gatherings. Striving to offer a point of difference within the greater urban environment, the idea was developed of 'day lighting'[3] Waitangi Stream; an idea that led to the ecological contribution of the site to its broader harbour environment and provided greater reference to the natural and cultural history of the area (Site designer, Personal communication, December, 2011).

The design 'daylights' Waitangi Stream via a 'water scrubbing' system that draws some of the water from Waitangi Stream (which is in pipes underground), filters the water through an ultra-violet filter (figure 4-8), and then directs the water through a series of natural filtration processes, such as gravels and plantings (figures 4-5, 4-7, 4-8, 4-9 and 4-11), and into a reservoir (figure 4-14). The water of Waitangi Stream is contaminated. It flows through pipes underground, so treatment of the water is required before allowing it to be accessible because "...[You] *can't just bring it out* [the water]*...and allow people to touch it...*" (Site designer, Personal communication, December, 2011). Post scrubbing the water is improved in quality enough that it is able to be used for irrigation of the Park and neighbouring areas, with excess water returned to the harbour (Wellington Waterfront Ltd, 2004d). Waitangi Park also includes a seed bank (figure 4-13) among other features such as an integrated skate park and youth space (figure 4-10), children's playground (figure 4-4) and large grassed field (figures 4-6 and 4-12). The experiential qualities of the site lend themselves to this research through the exploration of the implicit, and possibly explicit learning values of a highly modified designed landscape that focuses on the sustainability of water systems.

The New Zealand Institute of Landscape Architects (NZILA) presented a 'Sustainability Award' for the design of Waitangi Park, primarily for its focus on water systems, though also for its support of conservation of the natural environment. The design was also winner of the NZILA 2008 Sustainability

[3] To restore the stream to a more natural state

Award of Excellence, 2008 NZILA Gold Award for Recreational Park Design, NZIA 2007 Supreme Award for Urban Design and Urban Design Gold Award and the Wellington Civic Trust Award, (Supreme Winner). It is said to be an example of recent urban Landscape Architecture in New Zealand that *"... boasts…an exemplary water management system that integrates environmentally sustainable solutions with civic use"* (New Zealand Institute of Landscape Architects, 2012).

Waitangi Park does not demonstrate an explicit intent to be educational, though it must be noted that an interpretation strategy consisting of interpretational signage and site furniture was designed as a part of the competition entry for the site, though the implementation budget did not allow all features to be created (Site designer, Personal communication, December, 2011). Consequently, 'official' information about the site and how it works requires a search of various places on the Internet and use of other written and visual media that have been published about the site. Wraight and Associates, at times also hosts on-site talks with various groups through which the site's design is explained and it's processes revealed (Site designer, Personal communication, December, 2011). Temporarily for 'World Wetland Day' (February 2nd) interpretation boards were attached to structures in the Park. Images were included on the boards to tell the story of the Park and its systems, though while successful and well received by the public, the boards were removed due to council restrictions on the period of time they were allowed to remain there (Site designer, Personal communication, December, 2011).

Acts of consciousness: use of Waitangi Park as perceived by participants

Participant intent for the use of Waitangi Park varied. The following will highlight uses as described by participants of this research.

During times of inclement weather, users indicated that the site is used as a transit route, rather than a destination. On finer days, participants highlighted that the use of the Park is a destination for leisure including football, fitness training, and skateboarding, and general child's play and also indicated their use of the Park as a corridor to move through on their way to a further destination, or as an integral part of their journey along the Wellington Waterfront. A number of participants advised that they visit the site for markets, festivals and concerts.

Use of the Park also revolved around its aesthetic and sensory functions. Participants noted that it provides access to an area of 'nature' or 'beauty' in the city; suggesting that it is different to spaces found within the greater urban environment that tend to lack those features.

Generally participants did not visit the Park with a learning intent, or see their use of the Park as a learning experience. Only one participant asserted that: *"... we are educated by our whole environment…"* (Personal communication, 2011).

Participant response demonstrates that Waitangi Park is used primarily as intended; a functioning urban space that caters for users' recreation and transitory needs. At a deeper level the Park offers to some an aesthetic and sensory difference within the urban environment. However, very few recognised any value it has for learning, or actively seek to learn from within the site's boundaries. On understanding the reasons for use of this site it has been made clear that explicit learning is not occurring, so if supporting learning in any form, Waitangi Park will likely demonstrate implicit values of the landscape in Learning for Sustainability.

Waitangi Park's influences on Learning for Sustainability

Participants at Waitangi Park have indicated that their Learning for Sustainability has been influenced more so at the subconscious level by their experience of the site. The following presents the results from participant interviews at Waitangi Park. Those implicit landscape values that appear to influence participant Learning for Sustainability, primarily at the subconscious level, are presented first, followed by an explanation regarding the lack of explicit learning opportunities on site.

Implicit learning

Participants in this research said that they were learning by way of implicit landscape values. Key theories and practices that are implicitly active that participants at Waitangi Park alluded to are presented below. Also presented are the ways in which those aspects of the site appeared to influence the participant according to their responses.

Immersion

Participants in this research noted that Waitangi Park offered a place of difference within the urban surrounds in which they could be immersed in some form of nature.

Participants demonstrated that 'immersion' had influenced their learning experience by:

- Prompting them to consider the positive aspects of including green-space within the urban environment. For example access to water and wildlife in this city environment was an aspect highly regarded by participants. However responses such as *"...it is a big recreational space in the middle of Wellington"* (Personal communication, 2011) and we use the Park *"...basically just to hang out"* (Personal communication, 2011) demonstrate that other than for its value in an urban space, users were generally unaware of the Park's reason for the inclusion of the nature elements as a part of a greater ecological motive. This lack of understanding was however was not intentional as a lot of participants, when the researcher told them about the site's ecological functions, became quite interested and began questioning its functions. Comments such as *"I didn't know this had a filtration system and there is a reason here, I thought it was just a nice park..."* (Personal communication, 2011) and *"...it would have been nice to have...more information boards..."* (Personal communication, 2011) showed that the participants genuinely had no realisation of the Park functions, though may have liked to learn further about the functions of the Park if presented with an obvious opportunity.

- Prompting them to consider the ways in which the site influences their own attachment to it. For example a Maori participant mentioned that it didn't matter too much what the reason for the Park was as she maintains a connection to the site no matter the implemented design or use: *"With the type of connection...*[she has] *with the land, it is in order to... continue to maintain what is actually there"* (Personal communication, 2011). However a number of participants showed attachment through the Park's *"...good use of space* [that] *leaves it quite open*" or through the way it satisfies their needs – some were simply *"...looking for a place to walk through by water..."* (Personal communication, 2011) and suggested that the Park was a place that provided that possibility.

- Prompting thought regarding 'nature'. Some participants believed the greenery on-site to be the 'original' species, though others questioned the choice of plants and thought that the 'nature' represented should be authentic. Participants' previous understandings of 'nature' evidently informed the degree of nature experience they felt the site provided.

- Recognising changes to the environment over time. For example some older users who have witnessed changes to the site and area, and its use over time noticed the site's 'new' layout and aesthetics. One stated that it is *"...nice to see something that is natural...original and that greenery is still there...even though population density has increased"* (Personal

communication, 2011).

Place specific design and sense of place

Participant response highlighted the importance of relating design to place and the ways in which doing so aids in learning.

Participants demonstrated that 'place specific design' and 'sense of place' had influenced their learning experience by:

- Showing concern for their local environment by making reference to water, a topic of local interest. For example questioning about the water and where it would end up and whether filtration was occurring before returning the water to the ocean (a near by natural resource) or whether it was just for demonstration or experiment.

- Showing that they had considered and made mental connections between the site, its surrounds, and their understanding of what may be occurring. Although participants could not recognise site functions, they showed that they had knowledge about the broader ideas behind ecological processes that were occurring on site, such as water filtration, after researcher explanation about the functions. However their understandings were in a different context. For example the ideas behind the design were related by respondents to topics of conversation in the public arena, such as urban development's effects on water quality, aquifer depletion, farm runoff and water issues in general. These understandings were seen to come from politics, media, family and personal background. A participant suggested that before moving to Wellington, he lived in Christchurch where *"...water is a huge issue"* (Personal communication, 2011) and that he is a journalist so covers some water issues for the Labour and Green Parties. Many users understood the functions and benefits/detrimental aspects of the site when they could relate it to something they already understood, such as the filtration of water – a response for example was that a participant had *"...heard of filtering water for survival and camping..."* (Personal communication, 2011) by filtering through layers of sand, though not filtering water through a park. Another was aware that water filtration occurs naturally *"...like reeds on the banks of rivers at home..."* (Personal communication, 2011) and linked that understanding to the need to look after *"...the water runoff...as it is bad for the streams"* (Personal communication, 2011).

- Showing that place specific design could promote thought about wider scale issues. The scale of 'place' with regard to the issues presented on-site was not limited to the immediate setting, but nation wide. A respondent related their understanding of the idea of using ecological processes in design to their local area of Rotorua, where they knew of natural ecological processes occurring throughout the district that could be, or are also represented in design. Another related the way they understand water issues to their agricultural background.

- Offering assumptions as to the site's function. Although participants said they did not often think or talk about the site functions and affects, they had an idea of what was happening. Some local participants suggested that they had made assumptions about the site's function as a water filtration system, as they were aware of the water issues faced in their urban environment. Some participants mentioned that they did not think about the lack of signage instructing them on functions, but rather made assumptions that the design was to do with filtration due to the cues presented on site, such as water plantings, the gravel and storage ponds.

- Showing that the design encouraged awareness of the wider environment. For example participants highlighted that the site was working in positive ways that would benefit the nearby waterways, such as not allowing dirty water straight into the sea. These responses suggest they had inadvertently considered impacts of the urban landscape on their local environment.

- Recognising that the site's design was fitting their urban environment. For example a participant indicated that they *"...love the way so many things are done in downtown Wellington...nice blend of open and city"* (Personal communication, 2011). Supporting this, other participants thought that the site was a positive use of space fitting the urban environment and noted the aesthetic addition it makes to the surrounding urban landscape due to the sites 'natural' elements. Literature suggests that creation of an emotional response to a site is important if it is to promote a message to its users(Lackney, 1998).

- Analysing the site through a local cultural lens. A Maori participant stated her connection with the land was because she has the status of mana whenua. She questioned the design, calling it momentary, even though others saw it as a draw-card fitting Wellington's style. Her belief was that it did not represent this 'place' as it could – 'place' to her is not limited to 'now', but to all of time - and this site was believed to be a response satisfying present day aesthetics and requirements. She claimed that it *"...caters for who is...there..."* (Personal communication, 2011). She insisted on the need for longevity in design. Through all of this response, she unconsciously exposed that she had been thinking about sustainability processes, ideas and values.

Landscape narrative

The inclusion of a landscape narrative and its impact on learning was made evident through recognition by participants of the design's focus on the former Waitangi Stream and the way the design informed of stream's importance to the area.

Participants demonstrated that this landscape narrative had influenced their learning experience by:

- Showing their understanding of the site and its reasons for existence. Citing that the reason for the Park's name and use was because of it formerly being the site of Waitangi Stream, and then showing an understanding that the filtration of water as a function of the designed landscape is positive in the urban environment: *"...I think it's a good idea...the whole notion of the Park is a good idea...the sourcing the water..."* (Personal communication, 2011).

- Recognising an absent part of the narrative. Asserting that the actual site features and history (a focus on Maori) was important 'to maintain what is actually there' and was somewhat missing, replaced by present day ideas and materials. A Maori Participant mentioned that her understanding of the site was to do with the stories of historical ownership and significance of this land to her people. She believed that *"If you have a connection to the land, you just grow up with it* [understanding]*...you learn things whether you want to or not..."* (Personal communication, 2011) though she thought that that this site did not portray the Maori history to others as well as it could.

Site layout

The positioning of the site and its position within its wider-scale urban surrounds emerged as an important factor influencing participant learning experience. Instead of focusing on the learning potentials of the site itself, responses have highlighted that the Park contributes at a broader scale.

Participants demonstrated that site layout had influenced their learning experience by:

- Noting that the site helps them to feel connections between different spaces and environments around the city. Mostly through its appropriate 'Wellington style' and materials, and through a 'water' theme that flows throughout the city.

Sensory design and material choice

The way that Waitangi Park encouraged learning was largely to do with its appeal to its users. Participants noted the Park's sensory difference within the urban environment that is created by the use of certain materials on site - the participants saw the Park as a provision of 'green space' within the city.

Participants demonstrated that sensory design and material choice had influenced their learning experience by:

- Noting the difference in setting that the site provides. Participants noted that this space, through its material use, was providing a positive environmental difference or 'nature' within the city, different to the otherwise hard urban landscape.

- Questioning the contested idea that a sustainability based site is coupled with un-sustainable material use. One participant in particular questioned the sustainability of the site, with its large grass area in need of maintenance, and its high use of concrete. Another questioned the cleanliness of site (due to its 'tendency to trap rubbish') and at times its smelly 'stagnant' water.

- Questioning the site's use of 'natural materials' in design. Stating that although the 'nature' and greenery was introduced back into the site, it seems to be a modern interpretation of what is indigenous. A Maori participant suggested that all of the plants used should be indigenous to the area when included in a landscape design.

- Thinking about what the features of the site are/were. For example, one participant noted the 'part that runs under bridge as if it used to be a river' because of the use of gravel and plantings (it was actually the beginnings of an old graving dock) highlighting that self-interpretation of the site is occurring through participant understanding of the materials used.

Explicit learning

Participants from Waitangi Park highlighted the lack of explicit cues to sustainability-focussed education within the site. For example, regarding the seed bank, a participant asserted that *"It doesn't look that…controlled…you just don't notice people coming in and doing it*" (Personal communication, 2011). Many called for the inclusion of signs on-site to allow them to understand its functions. One response that highlighted this was that it would *"...be cool if they could say this is the Waitangi Park project and show that it is a functional ecological zone"* (Personal communication, 2011), and many others appeared to support this idea. However some participants recognised that the Park has links with Te Papa and schools – it is used as a 'classroom' for education.

Although the designers offer site tours at times, it appears that none of the research participants were involved in one of those informative tours.

As many participants demonstrated, learning experience relied heavily on awareness. If the participants were not previously aware of the site functions, they didn't seem to know that the experience that they were having was within an ecologically functioning environment. Although many were evidently learning via their subconscious, aspects of which were drawn out through the interview, their desire to learn more on realising that there is an ecological function within the site suggests that the directed learning experience on-site may have room for further development.

Impact
(contribution to Lifeworld)

On analysis of the participant responses presented above, it is evident that through a combination of implicit Landscape Architectural theories and practices present at Waitangi Park, participant Learning for Sustainability has been influenced. Those theories and practices seem to have enhanced user knowledge of sustainability at the subconscious level of learning, by influencing user experience of the site. They have promoted consideration of topical issues of sustainability by the participants and have contributed to the view that sustainability-focussed sites can also function positively as useable urban spaces.

The ways in which experience of Waitangi Park has assisted participants in understanding ideas of sustainability, along with the ways in which site use has influenced participants' sustainability-focused values are presented below.

Understanding

From use of Waitangi Park, participants Learning for Sustainability was influenced. Participants in this research had gained an understanding about:

- Topical issues of water pollution in the urban area and the recognition that there is an aesthetically and functionally positive way of remedying them (While not stated directly by the participants, discussion with them revealed that they had an increased understanding in this area when they were provided with an explanation of the site functions).

- 'Nature' – some participants believing the Park is accurately demonstrating nature, while others challenging the use of non-indigenous species. Contemplation on the benefits of 'nature' in the city was encouraged, such as the aesthetic (scenery, beauty, spatial change) and functional (increased wildlife, ecological) benefits of including 'nature' in the urban environment.

- How to recognise natural processes occurring in nature and where they may occur. Participants noted that materials used tended to relate to a natural process, for example the reeds and gravel beds used in the filtration wetland provide an example of what may be occurring where those elements appear in nature.

- Waitangi Park itself - the Park's history and the importance of its function to filter the Water of Waitangi Stream. Participants who viewed the site with understanding tended to indicate their advocacy for like sites in the future.

- How urban landscapes can be designed with a sustainable/ecological function, though still be an aesthetically pleasing and functioning urban space. The benefits of such a site were recognised – potentially modifying public expectations for future landscape designs, meaning urban landscapes of sustainable intent may be advocated for in the future.

- Other issues in the urban environment that development is causing. Such as removal of nature and greenery, and promoting realisation of how places like the Park can be effective in filling that void.

Value

From use of Waitangi Park, participants' values regarding sustainability were influenced. Participants in this research indicated that they learned about the value of:

- Environmentally focussed urban landscapes. Participants valued the site as a place of difference where nature and wildlife can be encountered in the urban environment.

- Functional urban environments that make use of environmental ideals but also provide a place of positive aesthetic value.

- Changing design of urban environments over time toward more sustainable use of the environment.

- The wider local environment. Participant awareness and value of the site encouraged users to recognise the value of other local natural features and processes.

- Areas of 'green' that fit with the urban theme and wider Wellington setting while providing a landscape of use.

- Materials used in the creation of landscapes. Participants questioned materials used at Waitangi Park calling them unsustainable, showing that they had some knowledge of sustainable materials and thought that they should be used.

- The cleanliness of waterways. Participants noted the stagnant versus flowing or clean water and the affect it can have on an urban space.

- The landscape as a learning resource. Participants recognised Waitangi Park's use for learning via Te Papa and for local schools.

- Of sites that function and the interest they can incite in a landscape if it is understood that those features exist.

Summary of Waitangi Park

These results have shown that Waitangi Park provides Learning for Sustainability by acting on the users' subconscious through their experience of the site. The sustainability knowledge that is gained is more so regarding broad-scale issues outside of its own boundaries - users do not appear to have an increased knowledge about the actual sustainability-based functions of the site (such as how water filtration occurs) but rather have recognised the positive functional and aesthetic benefits that environmentally focussed sites may have for the wider environment. Users also have an increased understanding of the importance of embracing positive environmental values in the development of urban spaces.

4.4 Case study site 2: Paradise Valley Springs

Objects of consciousness: the site

Paradise Valley Springs Wildlife Park is a privately run business on the outskirts of Rotorua. It is named after a fresh water spring located on-site, Te Waireka. A fee for entry (Adults $30 and Children $15) sees local residents, or out of town and international visitors funding the upkeep and further development of the Springs. Visitors are encouraged to spend one to two hours on site in order to appreciate the entirety of the experience provided. This rural site has evolved over a substantial period of time from 1939 to the present, initially operating as a trout sanctuary, then developed into a fully operational wildlife sanctuary. Its main feature is the Ngongotaha Stream (figures 4-22,4-31 and 4-32, page 63) and the surrounding native bush. Many animal species also feature at the Springs and with the exception of the Lion Pride (figure 4-18 page 61), all animals within the park are either commonly found in the New Zealand bush, or are found on New Zealand farms (PVS Owner, personal communication, December, 2011).

The structure of the Springs is such that one uses directional signage (for example figures 4-17 and 4-28 pages 61 to62) to move the user through a series of interlinking experiences, allowing them exposure to both the natural and human modified landscape. The journey encourages users to imagine, understand and challenge the way(s) in which they treat, or have treated their environment. Links with the wider natural landscape are created by way of borrowed views (figure 4-29 page 63)- with native bush on one side of the Springs location and farmland on the other. Te Waireka spring (figure 4-26 page 62) is situated at the topographical 'top' of the site, eventually flowing down into the Ngongotaha Stream. Together, the spring and stream are the original attractions of the site.

The Paradise Valley Springs site includes:

- Lion pride viewing and lion cub patting
- Seeing and feeding trout (figures 4-22, 4-24 and 4-25 pages 61 to 62) and native eels
- New Zealand birdlife: Kea (figure 4-20 page 61), Kakariki, Wild birds, water-bird wetland (figure 4-33 page 63)
- New Zealand farm-walk: presenting a number of animals farmed within New Zealand along with opportunities to feed them (figure 4-34 page 63)
- Spring water: Te Waireka Spring and its Maori legend (4-26 page 62). Able to drink directly from the spring or purchase water from the on-site spring water bottling plant (figure 4-19 page 61)
- 'Treetops' walk with interpretation boards (figures 4-28 and 4-29 pages 62 to 63)
- New Zealand bush walk (figures 4-21, 4-23 and 4-30 pages 61 to 63)
- Various viewing platforms and seats within the bush (figure 4-27 page 62)
- Visitor centre and café
- Guided walks and presentations

The following provides a map of Paradise Valley Springs (figure 4-16 page 61), along with a pictorial guide to the site (figures 4-17 to 4-34 pages 61 to 63), and then description of the site.

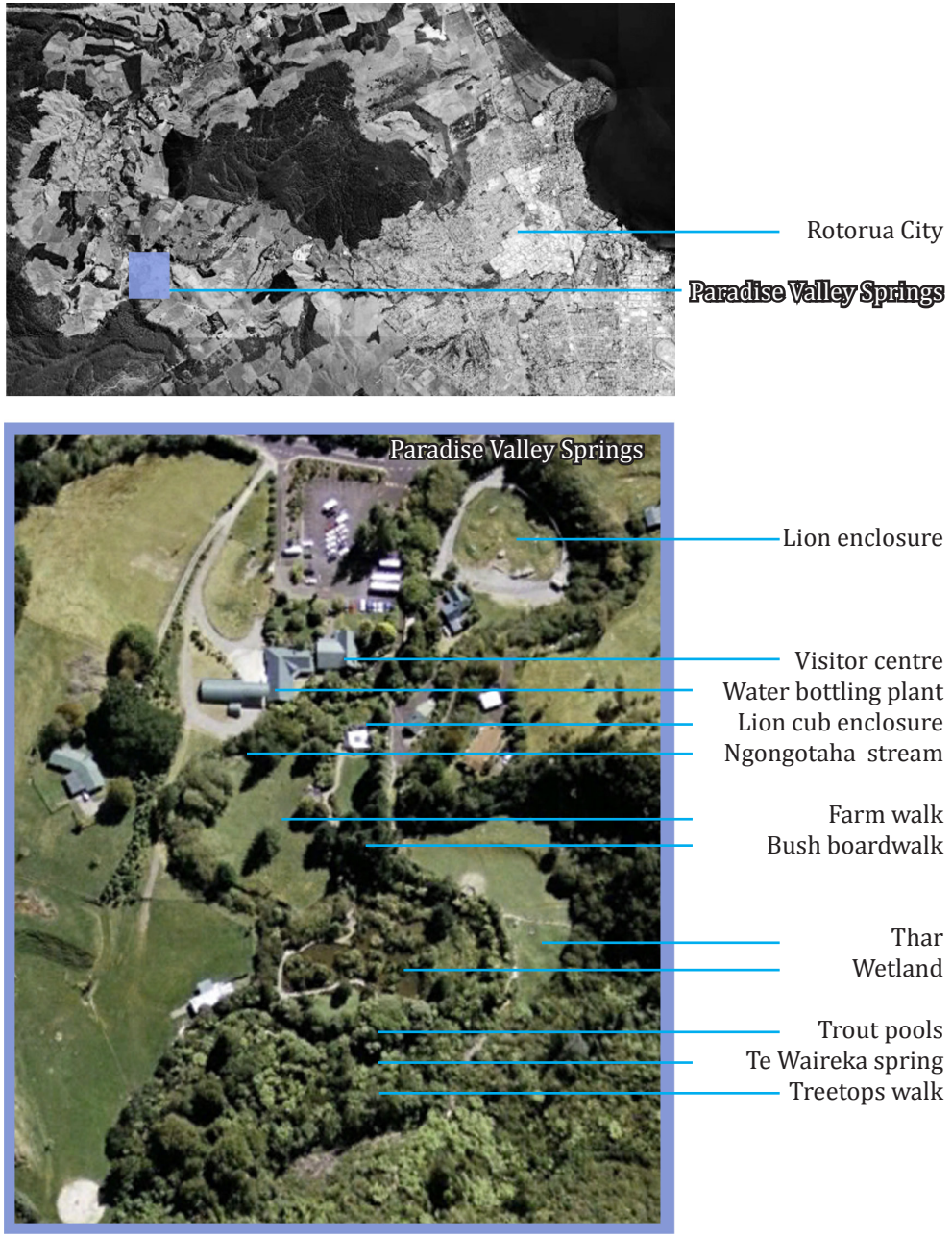


Figure 4-16: Paradise Valley Springs location and features (NTS) (Google Earth, 2012)

Figure 4-17: Directional signage on entry to Paradise Valley Springs


Figure 4-18: Lion enclosure


Figure 4-19: Water bottling plant - Glass frontage allows visual access

Paradise Valley Springs

Figure 4-20: Kea and bird enclosure


Figure 4-21: Bush boardwalk


Figure 4-22: Physical access to the Ngongotaha stream

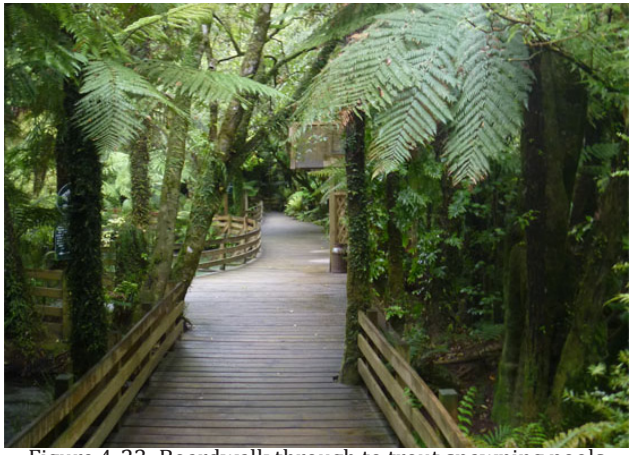


Figure 4-23: Boardwalk through to trout spawning pools

Figure 4-24: Trout spawing pools

Figure 4-25: Brown and Rainbow trout in spawning pool

Figure 4-26: Te Waireka spring and basic informative signage

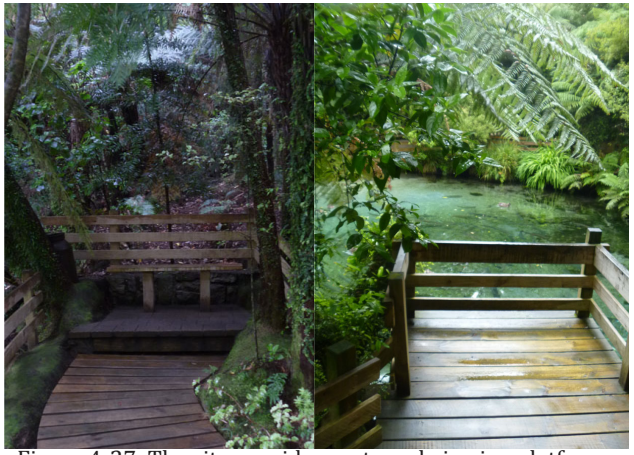


Figure 4-27: The site provides seats and viewing platforms throughout the bush

Figure 4-28: Treetops walk directional signage

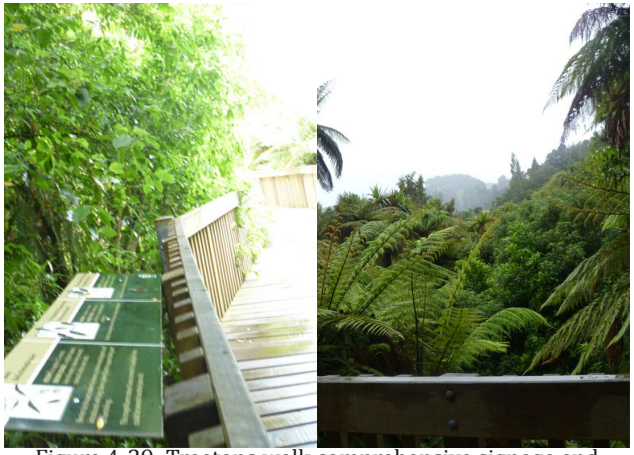


Figure 4-29: Treetops walk comprehensive signage and borrowed landscape views

Figure 4-30: Path through bush toward Ngongotaha stream

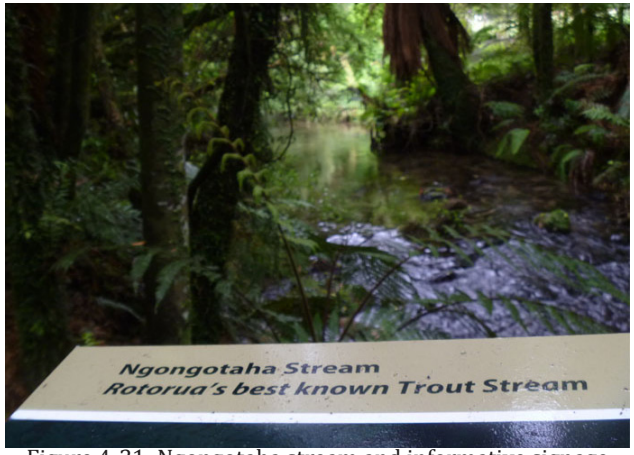


Figure 4-31: Ngongotaha stream and informative signage

Figure 4-32: Streamside walk

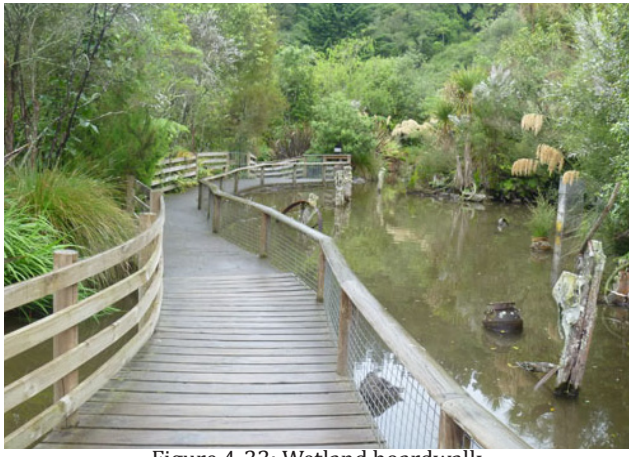


Figure 4-33: Wetland boardwalk

Figure 4-34: Interactive farm walk

Figures 4-17 to 4-34 sourced from (Robinson, D. 2011, 2012)

Objects of consciousness: the site's design intent

As with any wildlife park, this site seeks to provide access to different wildlife and their environments. The owner of the Springs indicated that almost all of the wildlife presented is found throughout New Zealand natural or farmed environments. He also suggested that ensuring that visitors learn about the sustainability of water systems, while being educated on the flora and fauna found (primarily) in the New Zealand bush, are high priorities of the site (Owner, personal communication, December, 2011). Paradise Valley Springs demonstrates an educational objective, made obvious through its multitude of signboards, wildlife encounters, interactive enclosures and guided tours.

Acts of consciousness: use of Paradise Valley Springs as perceived by participants

Paradise Valley Springs is a nature-based tourism destination just outside of Rotorua, a city that is one of New Zealand's main tourist destinations. A broad range of user groups, from busloads of foreign tourists, to local families and individuals, visits the Springs.

There is an entry fee associated with this site, meaning research participants had all chosen to visit, and thus had a desire to experience the site, although some advised that the site was too expensive to visit regularly. Sixty percent of the participants of this research were first time visitors at Paradise Valley Springs, whilst the remaining forty percent came annually.

Participants indicated that one of the primary reasons for visiting the Springs was as a leisurely family outing, to have fun and relax. It was believed to be a place to bring groups of children and adults alike, as it is an *"...absolutely... beautifully presented..."* experience (Personal communication, 2012). It was indicated that it is a great place to bring people for a 'break', for example as a trip while staying at the Ronald McDonald House. It was also seen as a destination while on holiday.

Most participants visited seeking an experience of the combination of nature, wildlife and animals; with many stating the reason for visiting was that it is a 'non zoo-like' environment. They noted that Paradise Valley Springs was different to a zoo because of its emphasis on a 'natural' experience that *"...gives a sense of place to the animals..."* (Personal communication, 2012). Providing connections with nature and wildlife was a key reason for parents taking their children. The opportunity to see and drink from the natural spring was also a factor drawing visitors to the site.

The use and experience sought by most visitors was similar, though there are varied perceptions on how that experience should be. It was mentioned that the busy times during opening hours sometimes changed the dynamics of the site -

it depended on who was in front or behind as to the positivity of the experience gained. Especially noted by one respondent was the times when *"...there's just the girls and I, and it is very quiet and peaceful..."* (Personal communication, 2012). This participant mentioned that New Zealanders appreciate their personal space, so their experience was affected depending on who was around them at the time. Another respondent contradicted this by stating that even with others around, the setting in nature made it *"...seem like you were there by yourself..."* (Personal communication, 2012).

Although commonly described as a 'New Zealand' type experience, a major attraction for users of the site was the lions and lion cubs. Respondents said that the lion pride, and potential to pat the lion cubs was a large factor in their visiting the site, though on visiting also took the time to enjoy the other aspects of the Springs. A return visitor noted that the lion cubs were not available to pat thirteen years ago when she was last visiting, so it was a welcome addition to her (and her children's) experience.

Whilst a high proportion of the participants asserted that they were not specifically there to learn, comments such as *"... we do the tree names a bit, and identifying birds and animals with the kids...", "...they will learn...it wasn't part of a school trip or anything..."* and *"...its not why we came, but we do throw it in..."* (Personal communication, 2012) show that a number recognised that they would likely learn something from their experience. Most who recognised the opportunities for learning however spoke as if the education was for their children, rather than themselves. A number however did state that learning was an objective of their visit. A number of respondents stated that they were there to experience what they do not usually have access to in their home environment, such as the animals, whilst others supported this in recognising the need of this type of place to educate people who do not normally have this form of access to 'natural' environments. Emerging here is that both implicit and explicit learning opportunities are being recognised and sought by many users.

Return visitors spoke positively of the site, and indicated that they bring visitors to Paradise Valley Springs as part of their New Zealand or Rotorua experience. Some even explained that they enjoy sharing the message the site portrays; before visiting they explain to their guests that the site would immerse them in New Zealand bush and nature. Participants compared the site to a number of other places in which they were effectively immersed in nature, these being Singapore Zoo, a similar park in Fiji, Te Waionui at Auckland Zoo, Rainbow Springs, Rotorua and the Currumbin Wildlife Sanctuary, Australia.

Paradise Valley Springs is clearly a site often visited with learning intent. Undoubtedly the site is used by a high number of visitors, and has effectively been laid out to provide a positive experience to those varied users. As participants have suggested, learning is a commonly sought goal of site use, which will provide points of comparison to Waitangi Park.

Paradise Valley Springs' influences on Learning for Sustainability

Participants at Paradise Valley Springs have indicated that their Learning for Sustainability has been influenced by their experience of the site. The following presents the results from participant interviews at Paradise Valley Springs. Those implicit landscape values that appear to influence participant Learning for Sustainability are presented first, followed by the explicit learning opportunities of the site.

Implicit learning

Participant response at Paradise Valley Springs highlights that there are a number of active implicit learning values active within the site that influence the users' learning experience. The following exposes key implicit learning theories and practices that were influential and presents those results.

Immersion

A learning feature of this site identified in participant response was its immersive quality, as defined in chapter two. Participants highlighted that immersion was supportive in their learning process, whether conscious or unconscious, and that it supported and reinforced the knowledge they already had, or the information they were provided by way of visual or oral aids on site.

Participants demonstrated that immersion had influenced their learning experience by:

- Recognising that the journey they undertook throughout the site taught them a lot about the New Zealand environment. Many participants indicated that by the end of the journey they were aware that they had been immersed in a learning environment that demonstrated a focus on water and the possibilities that a seemingly minimal human interference in the environment allows a positive environmental experience.

- Noticing that the site demonstrates a progression through a 'natural' environment that was then influenced by humans (participants identified human influence as the farm animal area and the inclusion of lions on site).

- Reflecting that on entering the site, they were unaware that the stream would be a main focus. Throughout the visit their eyes were opened to the fact that water featured in the site. A number suggested that they recognised the importance of healthy waterways because they could be surrounded by, see, touch and have access to the water and its associated life.

- Showing their positive reception of (and at times questioning) the experience they were involved in. Participants spoke of the site as tranquil and peaceful and noted that it was beautiful walking along the paths. They enjoyed the many photo opportunities. It was a place in which they were comfortable. Some noted that the enclosures, such as for the birds were 'very well done' and allowed an up-close experience, meaning that they could observe the beauty of the birds and experience the cheeky personality of the Kea. The experience provided throughout, immersing the participants, enhanced appreciation of New Zealand's fauna and flora and incited questioning as to why pests such as possums and deer were on display if the site's focus was on positive environmental values, or why the thar were enclosed in an un-natural habitat.

- Observing that the experience catered for different ages and desires. Some participants appreciated that the water, ducks and wildlife did not require interaction if they didn't want to, however others relished the opportunity to feed the ducks and animals, especially with their children.

- Mentioning that when it felt like there was no one else around, it was

'pretty different' - participants enjoyed the atmosphere, which added to the positive experience they had and subsequently the likelihood of their uptake of knowledge and their advocacy for further sites of this type.

Place-specific design

Participant response demonstrated that place-specific design was beneficial in providing an environment that was influential to learning experience. At Paradise Valley Springs participant response especially highlighted the special relationship of the site based within its rural surrounds and that the site promoted concerns about other less clean waterways.

Participants demonstrated that place specific design had influenced their learning experience by:

- Noting the focus on a waterway and suggesting that issues with waterways were a common topic for discussion in the public realm. Many were surprised at the possibility of drinking from the waters and the cleanliness of the spring water, as many other waterways are non-potable. A number of participants made reference to the topical issues of dairy/farmland waste and runoff/pollution and further participants spoke of local or international examples in which waterways were affected. In terms of water, local issues to which participants could relate, such as problems with the Rotorua lakes were described. The South Island issue of didymo arose and a participant from Dannevirke spoke of water problems in the Manawatu River.

- Questioning the selling point and ideals of New Zealand. One participant in particular disagreed with New Zealand's portrayed 'Clean and Green' image, suggesting that Paradise Valley Springs was an example of the image, especially the river, though in reality, the country's environment is not like that - although she wishes it could be: *"Wouldn't it be nice if they* [the rivers] *were all clear and clean and pristine..."* (Personal communication, 2012).

- Describing that the water focus of the site relates to other water-based projects around the country such as a project in Westlake, Twin Streams, or reserves such as Goat Island and recognising the projects' importance for the environment.

- Recognising that natural processes occurring on-site relate to wider issues and could aid in understanding how those issues may be treated. A number of participants were hesitant to drink from the spring water, not able to trust it because of what they had heard about many New Zealand waterways, but made the comment that the spring must be filtered through a natural means such as 'moss and rocks' so could be ingested. This was demonstrating their understanding that water must pass through something to filter it, and encouraging the participants to consider how this could be achieved in the wider environment. Some even relating the idea of filtration to the topic of dairy farm runoff and how streamside planting could aid in filtering that runoff.

Landscape Narrative

Paradise Valley Springs makes use of a landscape narrative throughout the site. Wildlife on display is that of New Zealand's bush environment, and the farmyard shows a number of farmed animals from within New Zealand. The journey from beginning to end demonstrates the interaction of these fauna with their respective environments.

Participants demonstrated that this narrative had influenced their learning experience by:

- Noting that the journey was telling a story about the influence of man on the environment and that it was demonstrating how the environment is and can be used for the benefit of humans, flora and fauna as one. For example a participant stated that the Springs demonstrates "... how you look after nature and how nature can help you..." (Personal communication, 2012).

- Questioning the inclusion of certain pest species on site that are included as a part of this otherwise perceived 'positive' ecological narrative. The inclusion of the possum was questioned, highlighting that participants know that the possum is detrimental to the New Zealand environment – one participant was confused at their inclusion as she *"...used to shoot them"* (Personal communication, 2012). Participants indicated that they had learned that the possum was a pest from elsewhere, and on seeing the possum were evidently encouraged to reflect on what they had heard about them.

Site layout

The directional layout of the site appeared to offer a journey through which participants could make connections. Furthermore, the 'borderless' quality of the site – fitting in with and making visual use of the surrounding landscape – enhanced the feeling of immersion in the New Zealand rural and bush environment.

Participants demonstrated that site layout had influenced their learning experience by:

- Suggesting that the journey within the site meant that they were able to make connections between the flora, fauna and human influence on the environment. A participant responded, *"...I noticed the water bottling plant...almost walked right by...then noticed the spring water was in the bottle..."* (Personal communication, 2012) highlighting that links were created because of their journey, when they realised that the 'water bottling plant' was bottling water from the spring that they had drunken from on-site.

- Many also noted that the directional signage meant that aspects of the site were not missed, so the experience was full.

- Stating that they were able to *"...get a feel for what a forest looks like"* (Personal communication, 2012) after being guided through the bush on the boardwalk. Also, that the journey through the bush and natural environment *"...gives a sense of place to the animals..."* (Personal communication, 2012).

- Suggesting that they had learned about the balance of 'nature' and the species around New Zealand and about the environments different species live in. One participant indicated that they learned a lot through the 'beautiful ethos' of the place. Other responses were that this site and its layout give a sense of place to the animals and how they look after each other.

- Noticing the connections between the spring and the bottle. On realising the link between the bottled water and the spring, some participants noted that it's 'good that they show the bottling and show the natural source'.

- Suggesting that the structure of the journey through the forest and the rest of the site made obvious the site's intention to immerse them and help them to learn about the environment. Comments such as *"*[it]*... certainly opened our eyes to it..."* (Personal communication, 2012) and *"... it became apparent when walking around..."* (Personal communication, 2012) were common regarding the educational intent of the site.

Sensory design and material choice

The sensory aspects of this site appeared to have a big influence on participant learning experience. The influence of materials on learning tended to be related to the minimal introduction of new materials, rather enhancing experience through the use of existing site materials such as the water and bush.

Participants demonstrated that sensory design and material choice had influenced their learning experience by:

- Suggesting that the boardwalk leading through the bush to the trout, eels, and natural spring water, along with the canopy walk added to the beauty of the site *"The way the track leads its way into the bush… awesome"* (Personal communication, 2012). It appeared to encourage users to explore the surrounds via a path that would mean they were not physically harming their surrounds and showed them *"…what native wildlife could be…"* (Personal communication, 2012) (if not impacted or impacted only minimally by humans) . Users appreciated being guided through the journey, especially noting that the simplicity of the wooden paths and rails supported their positive experience, rather than detracting from it.

- Noting that they were encouraged to touch and drink from the spring, so were able to make connections between the source of the water, the process it goes through on the way to the river and also the fact that that same water is bottled for consumption. For example many showed that they had been encouraged to think about and challenge what they were used to - some people didn't want to drink from the spring because they were used to drinking from a bottle. A participant said that the spring water was nice, though her "…*girls didn't want to* [drink from it] *because they are used to drinking from a bottle"* (Personal communication, 2012). In the same sentence that participant spoke of the dilemma of needing to cut down on use of plastics. This was a conscious realisation of the benefits to the environment of fresh, potable water. One participant stated, with relation to the clear water, *"Wouldn't it be nice if they* [the waterways] *were all clear and clean and pristine…"* (Personal communication, 2012) and another said that his wife drank some water up at the spring, he thought it was impressive - *"…I thought she was pretty keen…but I think she's pretty fresh that water"* (Personal communication, 2012).

- Realising that human-modification is not always required if nature is allowed to function properly. For example, in drinking the spring water some participants recognised the natural filtration processes of the spring, such as water passing through moss and stones where chemicals or added filters were not required, noted that it must be better for the environment.

Explicit learning

Interpretation

Areas of the site that explicitly provided basic information by way of interpretive means (primarily signboards) appeared to support the experiential qualities of the site, by supporting and reinforcing the experiences participants were partaking in, and offering recognisable cues to learning that the participants could associate with a learning environment. Participants tended to make reference to those interpretive features in their recognition that the site was providing them with a learning experience, however they often had trouble recalling the information from the signboards.

Participants demonstrated that methods of interpretation had influenced their learning experience by:

- Making reference to information provided on signboards around the site. For example talking about fallow deer velvet, being surprised about wallabies living in the New Zealand bush and that eels can live to over 80 years, all of which were indicate on signage. Also by noting that they realised that they were learning *"...because of all the signs and stuff"* (Personal communication, 2012).

- Talking about the signboards and their use of them. A participant highlighted that *"If you read* [the signs] *and follow it* [the sign-boarded journey] *through, it* was *very good"* (Personal communication, 2012). Many enjoyed the signs for their simplicity, saying that they *"...don't like too much information..."* (Personal communication, 2012), while others indicated the need for more in-depth information, stating that the signs *"...could have been a bit more informative about some of the species "* (Personal communication, 2012). *A number of participants* explained that the site offered a self-explanatory experience. The information boards made the site easy to understand and helped with an understanding of animals such as alpaca, kea and kakariki and animals and plants that respondents said they don't usually see.

- Although the more informative boards on the canopy walk were used often (some respondents recalled learning about the Maori uses of the flora, whilst others read about the trees and their environment) some respondents stated that although they felt they had read and learned, and that the signs were *"...easy to read..."* (Personal communication, 2012) they could no longer recall directly any of the information. For example a participant said that they had learned from the signs about flora on the treetops walk, though *"...none* [of which they]*...can remember now...* [at time of interview]*"* (Personal communication, 2012). Another participant was interested in, though had trouble with, the Maori pronunciation of terms on the boards. Also, a number of participants indicated that they did not have enough time to read the information of the more in-depth boards as they were looking after children. The participants demonstrated that they recognised the opportunity to learn and made use of the signage where possible.

- Indicating that they enjoyed being allowed visual access to the lion feeding and that they had learned about the pride from the feeder's oral presentation.

Impact
(contribution to Lifeworld)

On analysis of the participant responses presented above it is evident that through a combination of Landscape Architectural theories and practices participant Learning for Sustainability has been influenced. Those theories and practices have enhanced user knowledge of sustainability, have promoted participant consideration of topical issues of sustainability and have contributed positively to the future advocacy for sites of similar intent.

The ways in which experience of Paradise Valley Springs has assisted participants in understanding ideas of sustainability, along with the ways in which use has influenced participants' sustainability-focused values are presented below.

Understanding

From the experience gained at Paradise Valley Springs, participants' Learning for Sustainability was influenced. Participants in this research had gained an understanding about:

- The many kinds of wildlife not often seen or interacted with in the wild, such as kakariki (parrot) and wild brown trout. Many users had an increased realisation of the high number of species that ecosystems may support, and that the habitats of those species need to be looked after.

- Positive ways that humans can use or interact with environments that do not adversely affect the potential of those environments to sustain the life within them. And natural processes (such as a freshwater spring rising to start a river) and how those un-modified processes provide an important resource for people (spring water can be consumed due to natural filtration through moss, rocks etc). This increasing participant realisation that waterside planting and the like may work in similar ways – providing a tangible example in this area of public discussion.

- Nature, and that it can be educational. Cues such as signboards and guided tours indicated to the user that education was occurring.

- Where drinking water originates and how humans can quickly affect it through interaction with, or modification of the landscape.

- Healthy waterways. Links to public discussion in the media and outside of the site were created – the site provides an example of a clean waterway - potential for the future of New Zealand's waterways.

- What the forest feels and looks like, allowing people to form an attachment to their native landscape. Also about those flora and fauna and their importance in the environment - increasing personal understanding of how nature works in itself as a system, as well as how

it was utilised by Maori.

- A sustainability topic of public interest (healthy waterways). Participant knowledge about sustainability was reinforced on site – knowledge from participant occupation (such as working on boats – always around water), or from different media, such as TV campaigns, posters, Internet, radio and newspapers was reinforced or challenged through experience of a landscape that incorporates this idea. Also providing an example of a clean waterway to which participants can compare and recognise unclean waterways in their local landscape.

Value

From use of Paradise Valley Springs, participants' values regarding sustainability were influenced. Participants in this research indicated that they learned about the value of:

- Places of active Learning for Sustainability. These places enable the application and reinforcing of knowledge, especially for participants who have a personal interest in the topic(s) of the site.

- Water – and that it does not take much to alter its quality. As shown by participants noticing the spring water's journey from its source, to the dirty-looking wetland area. Participants indicated that they are now encouraged to advocate for minimal human interference on water systems in the future, so that the water could be as clean and clear as the waters of Te Waireka.

- The environment of minimum human interference. Participants noted that these environments provide a place of comfort and peace and recognising that there are few places in participants everyday lives to experience such tranquillity.

- Providing suitable habitats for the animals found in New Zealand. Participants realised (at the site scale that can be applied to larger scales) that it is important that the animals have enough of what they need in their environment, and that humans can influence those needs in either positive (for example trout and ducks in a clean, well vegetated stream) or negative (Himalayan thar in an enclosure not fitting their natural habitat) ways.

- The aesthetic beauty of clean waterways.

- New Zealand's natural environment and an idea of what it was like prior to human development, and realisation of what it could be like with less human intervention.

- A ‘complete’ forest environment and the importance of it remaining that way – that each strata of the forest supports the next, and that it is important for the future of the forest.

- Places of educational intent that also provide enjoyment, aesthetic and functional needs. Participants appeared to be interested in learning as a part of their experience.

- Having a place to visit and pass on the environmental messages that participants believe are important to others in the future.

Summary of Paradise Valley Springs

Highlighted in these results is that Paradise Valley Springs, created with learning in mind, provides Learning for Sustainability via a combination of explicitly educational features that support the implicit experience-based learning opportunities of the site. Whilst participants did not necessarily make direct reference to sustainability in their responses, the results show that factual understandings of sustainable processes and ideals were enhanced from experience of the site, and consequently the value placed on those aspects at a wider scale were influenced.

4.5 Research limitations

This research is an exploratory study into to an emerging field of Landscape Architecture. These research results respond accurately to the research questions, though further exploration into more specific landscape-based Learning for Sustainability issues, related for example to age and gender and occupation, may be important in the further development of this topic area.

Throughout this research, a number of limitations were encountered within the methodology and the application of that methodology. The following will highlight those limitations.

Limitations of methodology

Case study sites

The case study approach was useful, in that it allowed the comparison of two sites of similar scale and environmental intent even though they differed in function and learning style. However the time restrictions of this thesis only allowed me to select two sites for study. Multiple sites are believed to aid in the accuracy of results, meaning further research may be required to strengthen the results and the replication of the patterns uncovered in relation to Learning for Sustainability in the landscape.

Those same time restrictions meant selection of sites was made prior to completing a pilot-study, which is a recognised aid in selecting cases for study. The results gained may have benefited from a pilot study as it may have highlighted areas for change prior to research, or may have highlighted that different sites be selected that would better relate to this study.

Furthermore the timeframe into which the researcher had to fit the 'key informant' interviews, site observation and participant interviews for Waitangi Park was limited. This meant the researcher could conduct only one 'key informant' interview regarding the actual design of Waitangi Park, meaning the background understanding of the site design may not be as in-depth as it could have been. As Paradise Valley Springs is a privately owned enterprise, the owner was the only person available for comment regarding the site's design, meaning that professional designer input was not available.

On site interviews

While conducting on-site interviews a number of limitations were encountered. The slight rephrasing of some questions during interviews was required to aid in participant understanding. Alongside this, at Waitangi Park the participants had little understanding of the sustainability-focussed functions. To obtain sufficient responses to answer the research questions, an explanation of those functions to the participants was required. Basic, publically accessible information was provided verbally to the participants at the time of research, which in turn allowed more thorough response.

Also, as Waitangi Park is very open with a number of entry and exit points, research from a single place as proposed in the methodology was difficult. The proposed methodology was therefore not possible meaning movement around the site to obtain participants was required. Paradise Valley Springs however only had one exit point, meaning that the proposed methodology for location of interviews could be followed.

Site Conditions at time of Research

The majority of this research was conducted in variable weather, influencing the obtaining of participants for interviews.

Research at Waitangi Park was primarily in inclement conditions. Drizzly mornings and afternoon rain at times of on-site research meant there was a low use of the outdoor site and consequently a slow response. Few users ventured through the Park, rather moving around the periphery. Having to intercept participants on the outskirts due to the weather may not have provided an accurate record of users of the actual Park space, although most

participants indicated that they regularly passed through the site so had a good understanding of the site. Research at Paradise Valley Springs however was conducted in fine weather meaning participants were easily obtainable and able to participate in comfortable conditions.

The participants

A possible limitation of this research was that the ratio of male versus female participants was not even. Participants at Waitangi Park were primarily male (ten male vs. three female (with two more excluded due to ineligibility discovered after interviews). Whilst a number of females were approached a number handed the researcher on to their male partners to answer the questions, hence the high ratio of male respondents. Participants at Paradise Valley Springs were primarily female (ten female vs. five male). Often the females would decide to participate instead of their male partners, thus resulting in a greater number of female participants.

Phenomenology as a tool for analysis

Using phenomenology as a tool for analysis enabled the real-life affects of landscape experience on Learning for Sustainability to be exposed. However this tool of analysis could provide differing results depending on the person who is analysing the data due to its reliance on researcher interpretation of the results.

4.6 Results summary

These results demonstrate that the two New Zealand landscapes of this research are influencing users' Learning for Sustainability in a range of ways. It was evident that until the participants were questioned on site they may not have considered or discussed their thoughts about sustainability in their landscape, though participants demonstrated that the landscape was often assisting learning via their subconscious.

The responses highlighted two key outcomes for sustainability that were influenced through a landscape-based learning experience: those increased factual understandings and values of sustainability; and those experiences that increase advocacy for future landscape designs that maintain a focus on sustainable ideals. To reach these two outcomes, the designed landscape appears to influence participant learning in three distinct ways, which will form the basis of the following chapter's discussion: the degree of inclusion of the landscape user during the process of design; the implementation of designs that support the implicit value of the landscape and that include explicit learning cues in the landscape; and the degree to which sites promote advocacy for future sustainability-focussed landscape designs.

Chapter Five

Discussion

5.0 Introduction

The aim of this research was to investigate the role of the designed landscape in Learning for Sustainability, providing an increased understanding of theoretical and practical solutions that can be utilised by the Landscape Architect to aid in this area. Its focus was to explore two research questions. In response to the first question, 'How is Learning for Sustainability theorised, applied and implemented in the scholarship and practice of Landscape Architecture?' this thesis has so far summarised that the Landscape Architect can indeed be involved in Learning for Sustainability through their design of the landscape - a place of experience-based learning. It has explored how the designed landscape may incorporate practices and theories that influence Learning for Sustainability - identifying a range of implicit and explicit learning-based practices and theories that when implemented in the landscape, can influence, shape and direct learning. The 'results' chapter has presented an initial response to the second question, 'How does the designed landscape direct learning outcomes in relation to ecological environmental sustainability?' summarising that there are three key influences on Learning for Sustainability in the designed landscape: the degree of inclusion of the landscape user during the process of design; the implementation of designs that support the implicit value of the landscape and that include explicit learning cues in the landscape; and the degree to which sites promote advocacy for future sustainability-focussed landscape designs.

This discussion will further respond to the second question. It will firstly offer a brief summary of the ways in which the case study sites influence Learning for Sustainability. Following will be an explanation of what the public perceive is a learning landscape. And then the discussion will explain how the landscape's influence on learning can be broken down further.

As explained in the results chapter, participants of Waitangi Park were verbally presented with basic information about the site's sustainability functions to enable them to enter into a deeper level of response, and therefore better highlight how the site was influencing their learning. Participants of Paradise Valley Springs did not require an explanation of their site. The discussion points presented throughout this chapter are a result of the interpretive linking of knowledge from literature, expert knowledge, and participant response. Discussion will focus on the process of design – the ways in which the process may influence Learning for Sustainability; and on site-based learning - the ways in which the application of implicit and explicit theories and practices can result in learning *about* sustainability, and how the application of those theories and practices can also result in learning *from* the sustainability-focussed landscape.

5.1 Case study site summaries: influences on Learning for Sustainability

This section summarises the key ways that Waitangi Park and Paradise Valley Springs have influenced the research participants' Learning for Sustainability.

Waitangi Park

Waitangi Park's location within the wider Wellington setting has shaped a number of interesting results regarding the site's influence on Learning for Sustainability. Waitangi Park is not an explicitly educational site. Participant responses suggest that the Park's influences on Learning for Sustainability are not within its borders, but rather from the Park's existence as a feature within the wider urban environment. Users of Waitangi Park appear to learn *from* their use of the sustainability-focussed Park, rather than learning *about* its sustainability-based ideas and functions.

Paradise Valley Springs

Paradise Valley Springs on the other hand is a site of explicit educational intent. Participant responses highlight that the site's intent to provide a learning environment has affected user Learning for Sustainability, even though sustainability is not the site's primary focus. Participants often visited the site with the intent of learning, so results offer interesting differences to those of Waitangi Park. The Springs influences on Learning for Sustainability primarily occur at the site scale, through which participants have learned *about* sustainable ideas and practices. They have however also learned *from* their use of the Springs regarding positive use and interaction with their own home environment.

5.2 Learning for Sustainability through the designed landscape

Introduction

Initially in this research it was suggested that the Landscape Architect could be the educator within the public's landscape 'classroom'; a result of a broad review of literature. As this research has developed, and as participant responses have been analysed against that literature, it has become evident that the Landscape Architect is in a position to influence user Learning for Sustainability, though the possibilities lie in landscape designs that *support* sustainability ideas taught elsewhere. The Landscape Architect, through their design of landscapes, is working as a part of a collaborative and multidisciplinary approach to Learning for Sustainability, rather than as the sole educator.

A number of key outcomes regarding how the Landscape Architect can influence Learning for Sustainability through the designed landscape were found. Initial discussion in this section is around the public perception of a learning landscape as described by the participants, as perception appears to have an effect on learning experience. This is reiterated in the section regarding how users can learn from their use of the landscape. Highlighted also from the analysis of participant response, and in support of various literatures, is the importance of including the user in the design process if the site is to be utilised for Learning for Sustainability. Discussed therefore are landscapes designed via de-situated process, and those via situated process. Then this discussion will demonstrate, through comparison of participant responses with reviewed literature, how landscapes that apply a mixture of the implicit and explicit theories and practices identified in the literature review influence user learning *about* sustainability and user learning *from* the sustainability-based ideas of a site. Throughout these discussion points, responses show that a site can work at varying levels for learning, and that the landscape can affect short and long-term learning. Highlighted is that the foundation of landscape-based Learning for Sustainability is the users' experience of the landscape.

The learning landscape – a public perception

An important point of discussion that has emerged from this research is the public perception of the learning landscape. The Landscape Architect with an understanding of what the public may expect of their landscape for learning could better design to direct learning if and where the need arises.

A number of participants, especially those at Waitangi Park, openly demonstrated a lack of interest in landscape meaning, or in sustainability education. A common misconception of these users was that they were not being educated. They insinuated that the landscape lacked any obvious cues to learning. It became obvious that a high proportion of those participants believed that landscape-based learning requires didactic and prescribed learning opportunities. Responses in general supported this as most participants only recognised that they were undertaking a learning experience if the site employed universal learning cues, such as signboards and tour guides, as occurs at Paradise Valley Springs.

Suggested here is that cues to learning can be beneficial if the designer wishes to promote short-term recognition of learning. However, as the following sections of this discussion demonstrate, the Landscape Architect does not have to limit themself to generalised universal cues to promote learning, especially in the long term. Explained is that landscape-based Learning for Sustainability can occur at a level that transcends these 'traditionalist' perceptions of learning landscapes.

Influences of the designed landscape on Learning for Sustainability

Site design process

One key theme of response that appears to affect Learning for Sustainability in the designed landscape is the process through which the landscape was designed and implemented. Bodies of literature exist that explore the degree of situation[1] of users in landscape design. For example 'participatory design', a democratic approach to the creation of place in which the current, potential or future participants of a site are invited to cooperate with the designer to create a place that meets their needs (Kuiper, 2007); and 'participatory planning', an approach applied to decentralise planning - allowing the community concerned to be actively involved in the planning process (Healey, 2007, 2010a, 2010b). These focus on allowing the user into the design process, to create environments that are responsive to environmental and user needs, and that promote ones' attachment to place. The participant responses of this research support the benefits of situating the user in the design process, though with regard to learning. They highlight that user participation in the design process may be important in creating a place of positive experience, of greater attachment and therefore of understanding and value. In showing this, they emphasise that through the situation of users in the design process, sites may be utilised to aid in user Learning for Sustainability.

The degree to which the participants were included or consulted in the design process appears to have affected the ability of them to understand and be influenced by the sustainability focus of that site. Below is discussed the somewhat de-situated[2] design process of Waitangi Park, and its influence on its users' Learning for Sustainability. Then discussed is the way in which users were situated[3] in the process of design at Paradise Valley Springs and the apparently positive influence that has had on the participants Learning for Sustainability.

The de-situated and situated process of design and their affects on Learning for Sustainability

While many of today's landscapes may be designed with minimal consultation of the intended community of users regarding the design, the result is a de-situated process. This process may be time-efficient, however participant response from Waitangi Park has highlighted that a lack of user inclusion in the process of design may impede the ability of users to learn about sustainability through their experience of that landscape. Participant response suggests that this is not because they have a lack understanding of the sustainability-focussed

[1] Degree of inclusion

[2] Users not particularly included in the design process

[3] Users included in the design process to a greater degree

concepts, but because they lack the ability to recognise that those concepts have been applied as design features of the site. Recognition of those sustainability ideas can contribute to an environment of emotional and repetitive learning experience, which are explained further on in this discussion as important features of the Learning for Sustainability environment.

Below is discussed that the design process that does not situate the user may lead to under-utilisation of the landscape's potential as an aid to learning and how, according to participant response, the situation of users may occur at different levels in the design process.

Waitangi Park is the product of a design competition. Recognised by participants of this study was that they had minimal input in the process of design. They indicated their desire to be consulted throughout the process by noting that their input was limited to the choice between designs in the competition, rather than being included throughout the process. This appears to have had an effect on their understanding of, and ability to learn about and from the sustainability ideas of the site.

For example the vast majority of research participants had a basic understanding of the concepts behind the sustainability-based functions present within the Park, such as water filtration. Participants were able, after explanation that the functions were occurring, to compare this idea to processes of a completely different context, form or scale, such as filtering water for survival - *"*[I have]*...heard of filtering water for survival and camping..."* (Personal communication, 2011), or riverside plantings - filtration occurs naturally *"...like reeds on the banks of rivers at home..."* (Personal communication, 2011). They were not aware however that similar functions were occurring in the Park's context without an explanation of what they were, and where they were. The participants did not lack general knowledge about sustainability – they lacked the means to understand the site and therefore apply that knowledge to a different context. Emmelin (1976) and Haugen (2010) explain that input from the local community is beneficial for sustainable education, as the community included in the process of design will be the community who learns. They are supported by the literature of Kuiper (2007) and Healey (2007, 2010a, 2010b) who suggest that people who are included in the process of design can have a greater understanding of the place and how it meets their own, and their environment's needs. Analysis of participant response against this literature suggests that if the participants had an enhanced connection to the Park, they may have an improved understanding of its functions. This is an aspect that may have been improved through their inclusion in the design process.

Further, on explanation about the site's functions many participants seemed interested in learning more. Comments such as *"I didn't know this had a filtration system and there is a reason here, I thought it was just a nice park..."* (Personal communication, 2011), *"...it would have been nice to have...more information boards..."* (Personal communication, 2011), and it would *"...be cool if they could say this is the Waitangi Park project and show that it is a functional ecological zone"* (Personal communication, 2011) demonstrate this desire. These participants appear to be seeking an understanding of their landscape. Allowing users access to site-focused knowledge through inclusion during the design process may have allowed them to better interpret and apply their own sustainability-focused knowledge to their landscape.

Another point that arose through participant response was that those whom had a greater attachment to the site could interpret it with greater vigour. For example a Maori participant had a broad cultural and historical attachment. She mentioned that her understanding of the designed site was acquired through her understanding of the historical ownership of the land and the significance of it to her people now, and in the future. Such attachment appeared to influence her understanding of the site's functions and its positive value for the environment. This Maori participant indicated that she was able to recognise that the site portrays features that were a part of the original environment – such as water and vegetation – stating that it is *"...nice to see something that is natural... original and that greenery is still there...even though population density has increased"* (Personal communication, 2011). She mentioned that her cultural attachment allowed her to understand that the responsibility of the design is to sustain the site for future generations. Of note here is the importance of

allowing or promoting a connection with the land and of designing in a way that reflects or supports local values, in order to encourage peoples long-term attachment with their landscape and their recognition of the ways in which it may benefit its surrounds. As recognised in literature, the inclusion of site users in the process of design is one way of achieving this attachment to the landscape (Healey, 2007, 2010a, 2010b; Kuiper, 2007), and therefore greater understanding and value of sustainability-based landscapes.

Discussion above highlights that people can form connections with their landscape, and that those connections can help them to understand their place, and the designed landscape's values for the environment. The desire demonstrated by participants to be included in the decision-making for their landscape suggests that they actively seek connections with it. The process of design is one space in which these connections can be enhanced. It presents a potentially rich aid to long-term learning by promoting personal attachment to, and understanding of the landscape, its sustainable ideas and functions.

As a privately owned though publically accessible landscape, Paradise Valley Springs presents a differing level of user situation and inclusion. The benefits of its design process are discussed below.

Paradise Valley Springs is a site that has been developed over time. Discussion with the owner exposed that formal consultation with users was not a significant part of the design process, however he indicated that the design of the site was focussed on users' popular patterns of movement, or desire lines. Desire lines appear to represent the common movement of users to see or experience a specific aspect of a site, or to reach a specific destination. Paradise Valley Springs is a site used by a diverse range of peoples so it is possible that the desire lines created, and used to direct the design, are shared across multiple cultures and nationalities, so allow a site design that caters for and satisfies a wide-ranging audience.

Most participants said that they enjoyed the Springs' journey. However as most indicated that they have visited only once, or visit annually, this highlights the possibility for sites visited less often by the same user to embrace users' general desires in the design process. It is evident from participant response in this research that in doing so, future users may be satisfied with the site and the experiences it makes available through its circulation layouts. Considered further on in this discussion is that environmentally focussed sites that are positively regarded can in turn promote advocacy for the environment. With this in mind, it is possible that the semi-situated process of design undertaken at Paradise Valley Springs led to a positive experience. In turn promoting advocacy for the environment, and therefore contributing to user Learning for Sustainability.

Neither case study site included in this research was developed through a fully situated design process. Paradise Valley Springs is a privately owned site to which people visit less often than the likes of Waitangi Park, so situation of a distinct user-group is not necessarily always going to be feasible. However the inclusion of common desires appears to have contributed positively to a layer of Learning for Sustainability within the site. In a site such as Waitangi Park, the factor of feasibility arises when seeking to include the user-group. In a city as large as Wellington it may not seem viable to include every user in the design process. The way in which users may be situated in the design of such a landscape is an area that would benefit from further research, however the following example may be one way to incorporate the user, to enable them to understand the sustainable features of the repeatedly-used designed landscape.

Context and scale have been recognised throughout this research as important aspects of the sustainability-learning environment. Although these aspects are explored in greater detail further on in this discussion, this example demonstrates how the user may be situated within the landscape design of an entire city, through their inclusion in a temporary installation at a context and scale that is comprehensible to the general public. The goal of situation in this case is to allow the residents a greater understanding and value of sustainability-based landscapes, so they may support the creation of their city with a sustainable focus; an aspect of the design process that sites such as Waitangi Park could utilise for their positive contribution to landscape-based

Learning for Sustainability.
Théâtre Évolutif is a temporary landscape installation, created to help the residents of Saint-Michel, in France to make decisions for the future redevelopment of their city. The installation was presented, at an interactive and understandable scale, as an example of sustainable processes that were to be an underling focus of development for their city (OOZE architects, 2011).

Théâtre Évolutif is…a place where groups and individuals can come together with a common purpose to engage with and learn from one another…[T]hey can engage with and learn from the 'relational objects' of the Théâtre Évolutif ...
(OOZE architects, 2011, Para 3)

Figure 5-1 illustrates the learning process that was created, at a recognisable and human-scale, to enable residents to learn of the process that would be active within their city. This installation feature focuses on a sustainable water cycle.

Image removed due to copyright requirements

Figure 5-1: The sustainable water cycle (OOZE architects, 2011)

Figures 5-2 and 5-3 show the interactive process that enabled the residents to understand and value the sustainable processes that would be underlay the development of their city.

Image removed due to copyright requirements

Figure 5-2: Interactive toilet facilities illustrate the beginning of a natural filtration processes

Image removed due to copyright requirements

Figure 5-3: Residents drink water gathered from a process that began as they used the toilet

The learning experience that the residents underwent enabled them to understand and have the knowledge to support sustainable processes that may benefit their city. This provided a level of situation to a large-scale city design.

This example demonstrates that user situation in the design process does not need to be focused on the design itself to achieve an outcome beneficial to sustainability. Situation as a layer of the design process could focus on enhancing user understanding and value of sustainability functions that may occur at different scales. Learning for Sustainability could be supported via this layer of the design process, as it enhances user knowledge of processes, and allows them to apply that knowledge in the future to the context of their broader scale designed landscape.

Summary

For a public landscape to activate its potential in Learning for Sustainability, the process through which it is designed should be the initial focus. As this section has explained, the inclusion of the user or community in some way throughout a layered design process may increase user knowledge of the sustainability-based issues of the site. It has shown that user understanding of the site in context can enhance users' long-term learning and their ability to apply their knowledge to differing contexts, and may increase thought regarding the ways in which the site is of importance to its surrounding environment. The situated design process can increase attachment of the user to place, and therefore influence overall appreciation of sustainability-focused landscapes.

Site-based learning

*Learning **about** sustainability on-site and learning **from** the sites' sustainable focuses*

The literature of this research exposed, and the participant responses confirmed, that the designed landscape can influence ones learning experience through both implicit and explicit learning theories and practices. In turn it can enhance sustainability-based understanding and values. Further analysis of the understandings and values, that participants appeared to have gained from experience of the case study sites, revealed that two distinct learning outcomes for Learning for Sustainability have occurred: the participants have learned *about* sustainability; and the participants have learned *from* the sustainability focus of the sites. These two outcomes are discussed below.

*Learning **about** sustainability*

The implicit and explicit theories and practices that were identified throughout the literature review have been identified as influential to participant landscape learning experience at each site of this research. After on-site discussion with the participants, it emerged that their experience of the landscape, influenced their learning *about* sustainability. Understanding about sustainability-based ideas and functions is important in accomplishing a sustainable future as learners can increase their general knowledge of sustainability, enhance their ability to apply that knowledge in other contexts, their ability to understand and contribute to important topics of public conversation, and in developing their ability to analyse situations through a sustainability lens (Eisenstein, 2001; Enviroschools, n.d; Ministry for the Environment, 2012; National Forum for Partnerships Supporting Education about the Environment, 1994).

The literature review identified a number of essential stimuli that should be included in the creation of an effective learning environment, further the linking of the Landscape Architectural discipline to learning/education. The stimuli are emotion, context, repetition and possibilities for active participation.

Interestingly, the results highlight that these stimuli are all active in the case study landscapes – they are instrumental in influencing user understanding and values for sustainability. This section will discuss the application of these stimuli and their influence on Learning for Sustainability via experience of the designed landscape.

Acknowledged in the literature review was that the interrelationship between these stimuli is beneficial and occurs in the learning environment. However the ways in which the learning stimuli work are subject to the individual, so to maintain an accurate discussion of the broad possibilities for application of these stimuli, they will be discussed separately.

Emotion

Emotion aids in learning by improving memory retention and recollection (Lackney, 1998). This research has shown that the landscape contains emotional influences, such as a user being drawn to a place that supports their personal or cultural values or understandings, no matter its design. Participant emotion was influenced through their experience of the designed landscape and as a result their learning about sustainability was affected through the way that the sites link with their personal and cultural values.

Jeffery Lackney (1998) asserts that emotion is affected through the creation of environments that are thought provoking. Users of Waitangi Park appear not to have been provoked into thought to the degree that they were learning *about* sustainability. It was evident that users of Waitangi Park held little emotional attachment to the site that would aid in learning *about* sustainability, but rather were emotionally attached to its aesthetic value, which is discussed further on in this discussion (refer page 91) as influential in promoting advocacy for sites of this type. However during the interviews, the researcher was able to enlighten users about the sustainability-based functions of Waitangi Park. Once again, many began to compare the ideas to other processes they understood, such as water filters and river plantings. They were interested in learning more about the Park, even stating that with their new understanding they would *"...look at the Park through different eyes..."* (Personal communication, 2011). A simple understanding about the site's sustainability-based functions appeared to create this emotional response, forming a tie to the positive function of the site that in turn led the user to contemplate its sustainability-based ideas. So, while the Park does not appear to employ the stimulus of emotion by provoking users to think to help them learn *about* sustainability ideas, there is potential for it to do so.

Participants at Paradise Valley Springs demonstrated an emotional attachment to the natural aspects of the site. Responses such as it is a*"...beautiful place... just enjoy...passing the message on to other people we bring here..."* (Personal communication, 2012) suggest emotional attachment, and comments such as *"Wouldn't it be nice if they* [the rivers] *were all clear and clean and pristine..."* (Personal communication, 2012) highlighted that the beauty of the Springs environment promoted thought about why other natural environments were being degraded. These responses suggest that by influencing emotion, this site may have contributed to participants' values of natural environments and the ways in which they may treat them.

An example of an internationally designed landscape that explicitly aims to influence user emotion is The Red Ribbon, Tanghe River Park. Slight modification to the environment encourages use and appreciation of a previously perceived 'inaccessible' place. The residents once associated the area with slums and saw it as a site to dump rubbish, though a minimal modification to the landscape opened the space to use. Figure 5-4 (page 85) shows that it is the site of a boardwalk and 'red ribbon' sculptural element leading through a natural eco system – effective for highlighting the aesthetic and ecological worth of the area.

Image removed due to copyright requirements

Figure 5-4: (Dave, 2008)
The boardwalk and 'Red Ribbon' flow throughout the natural landscape

Residents of the area are encouraged toward an increased appreciation of, and attachment to the place through their learning about the benefits of this landscape, about its natural processes and its ecosystems. An increased positive emotional attachment to this landscape may have contributed to user learning *about* sustainability processes and the importance of them to the wider environment. The understandings formed as part of the emotional links may support the future sustenance of the Red Ribbon River Park, its environment, and like spaces.

This section has demonstrated that emotion can affect learning *about* sustainability through its influence on ties with ones landscape. Emotional attachment allows people to compare and contrast with other positive or negative experiences that have affected and created their emotional ties, so can be utilised to enhance thought and understanding about sustainability-focussed ideas.

Successful learning is supported by the contextual significance of the topic to the learner. Contextual learning leads to an increase in memory and potential recollection (McInerney & McInerney, 2010; Raiola, 2011). Within this study, it was evident that contextual site design played a significant role in promoting and directing Learning for Sustainability, especially when users were learning *about* their landscape and the sustainability functions and values of that place.

This research has highlighted that the designed landscape can be made contextual by way of place-specific design – design that is created with a distinct reflection of its place, and the values associated with that location. Discussed below is that participant response has emphasised that correct context can aid in the understanding of a site's sustainability-focussed functions and understanding about sustainability ideas and values of the wider scale landscape. Response has also highlighted that one may better recognise and understand the sustainability focuses of a site if they can directly relate the ideas to the surrounding environment, to a previous experience, to a cultural understanding, or to a previously learned idea.

Throughout interviews with the participants, sustainability-focussed ideas of the case study sites were discussed. The participants, on understanding the sites' features, regularly brought up issues of sustainability that are common in wider societal conversation, such as water conservation. This supports Edward Raiola's (2011) belief that people relate their understanding of their immediate environment to issues they have been exposed to elsewhere.

Participant ability to recognise and understand the sustainability-focussed ideas of each site was affected by the context and scale of the ideas' representation. The sustainability issues appeared to be understood at a particular context and scale according to the participants' own knowledge.

For example, at Paradise Valley Springs, discussion with participants often led to them making the connection of the clean Ngongotaha river and its surrounding

bush, with water issues in New Zealand. Throughout the interviews, many related the idea presented on-site - the sustainability of water - to the topic of dairy farms and their effect on rivers. Comments regarding dairy farms and their impact on nature such as *"Once an area is 'turned' you cant turn it back…that really freaked me out…if people know that, why are they allowing it to continue to get to that point?…I just don't understand the mentality behind it"* (Personal communication, 2012) highlighted that participants were relating their understanding of water issues to a topic of widespread discussion in New Zealand. Their understanding of the topic of dairy farms and water appeared to be at a similar physical context and scale to the issue presented on-site.

Waitangi Park on the other hand presents a similar idea about water, though participants had not realised that a man-made 'natural' scrubbing system was in action at such a scale. Unlike Paradise Valley Springs, the Park does not provide the user with an explicit opportunity to drink from the filtered water, or to understand the benefits of the water being scrubbed. After explanation of the scrubbing function by the researcher, participants could make a connection between the likes of water pollution - *"…the water runoff…is bad for the streams"* (Personal communication, 2011) - and the idea of water filtration. While one participant with a rural background could understand the scrubbing system with relation to riverside plantings, noting that the system may work *"…like reeds on the banks of rivers at home…"* (Personal communication, 2011), many participants of could not comprehend the idea at such a large scale - at best they could relate the idea of filtering the water to pool filter systems or home water filters – both of which are at a far smaller scale than the Park's design.

Supporting the literature of Raiola, these responses suggest that the user can understand and relate to a function if presented to them in a similar scale or context to their knowledge. The Landscape Architect needs to be aware of the contextual understandings that the site users may hold if they wish to make obvious the sustainability functions of a site – if at an uncommon scale some form of explicit cue, in the form of a written or oral description may be required.

Landscapes are also able to contribute to learning *about* sustainability by providing a layer within the design that relates specifically to the place in which it is located.

One place-related idea that influenced user learning *about* sustainability at Waitangi Park was the inclusion of water. During on-site discussion, a number of participants suggested that they thought that the design's use of water was related to issues of urban storm-water filtration. During discussion with a Maori participant, she suggested that those people do not know about the true water source because they lack a deeply rooted connection with the land, stating *"If you have a connection to the land, you just grow up with it* [an understanding]*…"* (Personal communication, 2011), and *"…the water system here…some people can't see it because it's a momentary thing for them"* (Personal communication, 2011). However one particular participant response demonstrated that it is not imperative for one to understand a site's sustainability functions correctly if the site is to influence ones learning about sustainability. He queried, *"…Why are they filtering this water? Just as a demonstration…or is it an experiment…or is it actually filtering the water before…ocean?"* (Personal communication, 2011), thinking that the site was a catchment for the area's storm-water. Although not necessarily correct in his assumption of the Park's function, he demonstrated that consciously or not, thinking about the inclusion of water was a part of his experience of the site. That he miss-interpreted the function may not be of great concern in his Learning for Sustainability, as he at least noticed the presence of water and related it to a topical sustainability focused issue that he understands is relevant to this urban context - storm-water.

This suggests that contextual design that supports sustainability ideas of the broader-scale may contribute to a site's Learning for Sustainability layer by providing the opportunity for users, both local and foreign to an area, to interpret sustainability ideas according to their own understanding. This may contribute to their knowledge about how those ideas are considered and dealt with throughout the landscape. It also suggests that the designed landscape that supports sustainability ideas is making a contribution to Learning for Sustainability.

Though Waitangi Park appeared to be successfully promoting thought about broader concepts of storm-water and the possibilities for dealing with it in the urban environment, a number of participants had noticed, or had heard that the site's use was as a filtration system. They mentioned however that they, for example, *"...didn't know about whole idea of bringing the water to the surface..."* (Personal communication, 2011). Clearly participants could see the water, though responses such as this highlight that they did not know where it came from. This raises the question about the utilisation of the learning benefits of a grand scale sustainability-focussed design that is not recognised as such. While the design may contribute to a broad scale understanding, Waitangi Park is actually a deeply place-specific and contextual design that could be better utilised for learning. The following example highlights the potentials for highly contextual and sustainability-focussed landscapes to be designed to aid in learning.

A fundamental requirement of the developing Landscape Architectural practice Eco-revelatory design is that designs of sustainable intent should be 'truthful' in order to portray the correct idea. Eco revelatory design calls for a complete and authentic process to be presented to be of greatest impact on the learner. Participant response highlights that this truth-factor is somewhat lacking at Waitangi Park.

The Arcata Marsh and Wildlife Sanctuary was introduced in the Literature Review. It is an example of how Eco-revelatory design has been applied to successfully aid in user understanding of water processes through the use of a truthful and contextual design. The Sanctuary incorporates a secondary sewerage treatment wetland to display the process of filtration to residents of the area (Figure 5-5).

Image removed due to copyright requirements

Figure 5-5: The Arcata Marsh and Wildlife Sanctuary (Humboldt State University, n.d.)

The design reveals an alternative function to a sewerage treatment station, that can be of benefit to local residents and their environment, so is of contextual significance and aids in their understanding about the use of sustainable processes. The Sanctuary is highlighting the importance of clean water and environments in supporting various species of wildlife, though does not hide that the water is sourced from the sewerage system. The filtration system is combined with symbolic gestures that represent, for example, streams that were located on site pre-development. It also includes signage to explain the processes of the functioning wetland and the wildlife found there. It is an example that is highly context dependent, though contributes to residents learning about ideas that function positively for sustainability.

This section highlights the importance of context in user understanding. Learning for Sustainability will likely be supported and understood, to a greater extent by sustainability-based designs that can be easily related to, by the user.

Repetition

Repetition is believed to be an aid in learning. It refers to the opportunity to encounter ideas, and new learning experiences a number of times, enhancing the possibility for retention of that knowledge (Coombs, 1973; McInerney & McInerney, 2010).

Both sites of research make use of repetition of sustainability-based ideas and practices, which aids in user learning about those areas. This learning stimulus is evidently affecting participants in two distinct ways: providing them with a repetition of a sustainable idea or function that is previously understood, or providing a common cue that is repeated throughout learning environments that enhances user realisation that the site is a learning environment.

The two sites of research are promoting learning about sustainability through the repetition of sustainability-focussed ideas at differing scales. Participant experience of Waitangi Park is less actively involved than Paradise Valley Springs so tends to offer indirect learning experiences. For example learning with a broader-scale focus about water systems. Whereas, Paradise Valley Springs provides an intimate environment through which users could delve deeper into water issues and learn about specific aspects of water systems through a directed experience and within a site of educational intent.

At Paradise Valley Springs, users drinking from the spring indicated that they were challenged to think of where that water may have come from. Many assumed that it was fresh because of its location in the bush and because the water was welling from a spring, so had not yet been affected by humans. Many made the connection that the water must be filtered through the layers of rock and moss. These assumptions relate to users' previous experience and understanding of nature – some assuming that natural springs in the bush, coming from underground, are usually potable because of the natural processes they have been through, and recognising that human processes can affect water systems and water quality.

Water is a repetitive feature of the site. The site's journey shows the spring water emerging topographically above all other site features, and flowing down to the river and wetland (as well as ending up in the water bottling plant). This repetitive use of water as an element encouraged visitors to contemplate the different journeys of one of life's key resources. Some were too afraid to drink from it because they do *"...not...drink from anything that looks pure...something might be dead upstream"* (Personal communication, 2012). This suggests that they have contemplated the issue of water on-site and the reasons behind why they may or may not drink from the natural source. Comments such as *"...I think she's pretty fresh that water"* (Personal communication, 2012) demonstrate that through the experience of the user on site they were led to believe that the water was safe to drink because of the environment it was within.

The repetitive use of a feature across a landscape can lead to recognition of it. So repeated use of a sustainability-based idea may contribute to the recognition and contemplation of that idea, within the landscape.

Cues to learning such as signboards that are often employed in places of learning, were helpful in the recognition that a learning experience was being presented. It was clear from discussion with respondents that the result of knowing that they were entering a learning environment was that users were in a frame of mind that was open to learning throughout their visit. Interestingly, participants showed a tendency to recognise the educational value of signs, but not recall exactly the information that was provided on them - rather recalling the associated experience within which they read the sign. This reflects the accuracy of the suggestion that *"...visual and spatial information in combination with words is far more effective than words alone"* (Kaplan, Kaplan, & Ryan, 1998, p. 25) and highlights that participants may remember the features of an environment that relate to the signs better than the information of the sign itself.

A cue to learning, such as a signboard, is of benefit in the landscape of explicit learning intent as it can include information that is repeated within the associated experience. Repetition may help the user to recognise that the

experience associated with that place may be one of learning. This provides an aid to landscape-based Learning for Sustainability as it may be realised that an experience is actually one of sustainable-learning intent. Knowledge obtained during that experience might then be more easily recalled.

This section has summarised that the repetition of ideas or specific features can aid in learning. It highlights that recognition of sustainability-focussed ideas and processes can be enhanced if they are a repeated part of ones designed-landscape experience.

Active engagement

It is believed that the transformation of an environment into a place of active engagement supports learners (Garrison & Vaughan, 2008; Kerka, 2002; Kuh, Schuh, Whitt, & Associates, 2005). Participant response has highlighted that there are three distinct ways in which the Landscape Architect may direct Learning for Sustainability through active engagement: by creating memorable encounters via interactive environments, by supporting a site's explicit use of didactic information, and by encouraging interaction and conversation between users.

Sites such as Paradise Valley Springs utilise active engagement with nature as a key-learning stimulus. This has proven to activate its potential as a Learning for Sustainability environment. By providing an interactive journey, the site allows its users to engage in multiple experiences and recognise connections between those experiences as they progress. For example, users recalled their active engagement with the spring 'Te Waireka' where they could drink directly from the water, savouring its 'sweet and fresh' taste. From there they moved past the trout spawning pools into which the spring flowed, and then through to the muddy-watered wetland. One participant in particular had a realisation about the degradation of the water and explained that the journey they had gone through showed them how quickly water quality can be changed – from potable to non-potable within a matter of metres. Awareness of water quality was initialised because of the participant's active engagement with the spring.

This example demonstrates the potential for active engagement to contribute to memorable encounters - especially with regard to positive or negative environmental changes. These encounters enhance memorable experience and are focused around a topic of sustainable origin. As a result, positive or negative encounters that encourage thought about one's environment can then be consciously or unconsciously applied to analyse future situations through a sustainability-related lens.

Active engagement also works in the learning environment by supporting didactic information of the site and promoting uptake and recollection. It has already been discussed that the combination of visual information with words is far more effective in learning than the use of words alone. In addition, this research has shown that participants actively participating in an environment to which a sign refers enables them greater understanding and recollection. A response that demonstrated this was when a participant at Paradise Valley Springs recalled the 'treetops' walk along which each sign was located within range of the tree or bush of interest. They recalled the Kawakawa tree that was explained on the signboard as a medicinal plant that was used by Maori to cure stomach pains. The signboard had indicated that the leaves have holes in them - a way of identifying the tree. The participant said that they recognised Kawakawa several times throughout the remainder of the journey because of its distinctly shaped leaves with holes in them. The combination of didactic information with active engagement evidently helped this participant to uptake and recall knowledge about the tree, reinforcing that this combination can be effective in learning.

An example in which the combination of didactic information with active participation could have been successful was highlighted in response from Waitangi Park. Responses such as *"It doesn't look that…controlled…you just don't notice people coming in and doing it*" (Personal communication, 2011) and *"I didn't know this had a filtration system and there is a reason here, I thought it was just a nice park…"* (Personal communication, 2011) show that a number of participants noticed, after explanation of the functions by the researcher, a lack of visible control of, or explanation about the designed ecological functions

of Waitangi Park - such as the filtration system and seed bank. This meant that those users were not immediately aware of those sustainability-focussed processes of the site.

As Raiola (2011), Robottom (1987), Robottom & Hart (1993) and G.A. Smith & Williams(1999) suggest, people learn as they interact with their environment. So experience of the site likely contributes to user knowledge - layers of implicit meaning and connection not immediately recognised by the participant likely contribute to their future understanding and recollection. However, on-site didactic information may have provided the opportunity for immediate learning about the site's sustainability-focused features. This may have improved user recollection of these aspects in the short term, and therefore their potential to recall and relate to those positively functioning processes in the future.

Active engagement can also encourage conversation, which in turn can lead to increased awareness of the environment and of environmental functions. Participants at Paradise Valley Springs for example discussed water quality of their home environment versus the water of Te Waireka and why they would or would not drink from it – in case of ground pollution or the like. They also talked together, during their visit, about how the spring had gone though a natural process of filtration so would be safe to drink. Participants may have an enhanced understanding about the processes of their natural environment as they have undergone multiple forms of engagement – actively experiencing while talking with others undergoing that same experience. This may then have contributed to their broadened knowledge of a sustainability topic because of the possibility to explore their own knowledge, while learning from the knowledge of others.

An example of the application of active engagement that clearly influences Learning for Sustainability is the ChonGae Canal Point Source Park of Seoul, South Korea. Figure 5-6 shows that the landscape design has day-lighted the formerly piped ChonGae waterway, allowing residents access to the water. The site's focus is to reunite residents with an appreciation and understanding of their waterway. Since the design encourages active engagement, participants

Image removed due to copyright requirements

Figure 5-6: *"ASLA 2009 Professional Awards | Sunken Stone Garden"* (Gardener.Ru, 2012)
Residents are actively re-connected to the ChonGae waterway

of all ages can converse about the waterway, creating the opportunity for knowledge to be shared across users.

The site is designed in a way that enables active observation and conversation about local water fluctuation and quality. It provides a space in which residents can re-learn about the importance of this resource of cultural and ecological significance so contributes to sustainability-based learning.

This section has highlighted that active engagement is an effective tool for use in the learning landscape. It supports learning *about* sustainable ideas through its contribution to multi-layered experiences that can reinforce didactic learning, and enhance users' recollection of previous knowledge, both in the short and long term. It is a stimulus that can support user values for sustainability, or cause those values to be challenged.

*Learning **from** experience of sustainability-focussed landscapes*

Advocacy

An important conclusion of this research has been the idea that learning *about* aspects of sustainability is not necessarily the only way in which the user of a designed landscape can learn, for sustainability. To be discussed in this section is that the user can learn *from* their experience of a landscape. The results demonstrated that user advocacy for designs, such as the case study sites, was increased through their use of the sites. The following will highlight the key reasons for an increase in advocacy, and will explain how advocacy for certain environments could help to attain a sustainable future.

The learning stimulus of emotion was shown to enhance Learning for Sustainability *from* use of the landscape. Users who formed a positive emotional relationship with, or positive view of a site learned *from* their use of that site. Kerka (2002) suggested that the learning environment that fosters positive relationships is important, and participant response supported this. Their responses, such as *"*[it is]*...nice to see something that is natural...original and that greenery is still there...even though population density has increased"* (Personal communication, 2011) and *"*[I]*...love the way so many things are done in downtown Wellington...nice blend of open and city"* (Personal communication, 2011) from Waitangi Park; and, it is an *"...absolutely...beautifully presented..."* experience (Personal communication, 2012) and "*...it is very quiet and peaceful..."* (Personal communication, 2012) from Paradise Valley Springs, imply that the consequence of a positive view of a landscape is that users are more likely to advocate for sites such as those of the study in the future – as the sites have a sustainability focus, a contribution to sustainability learning has been made.

In addition, while it may seem like a simple and well-known fact it is important that the Landscape Architect also realise that users' positive perception of a landscape relies in part on a site that satisfies user needs. This in turn may influence their advocacy for like landscapes in the future. For example, as a site designed to cater for various needs and activities, Waitangi Park was generally believed by participants to operate successfully. The inclusion of functional aspects such as the field and skate park, in conjunction with aesthetics that were noted to compliment the theme of wider Wellington, were key factors in positive perception of the park. The site was noted to be a highly used space, laid out effectively to allow movement through or pause within the site. Respondents also mentioned that the layout of space at Waitangi Park enables multiple user types and age groups to co-inhabit the site - especially the skate park area. They said that the site felt safe, so would use it often with children. This suggests that the site functions positively, encouraging a positive user response and therefore increasing the likelihood that they may advocate for future landscapes of this type. Use of Paradise Valley Springs also resulted in positive user response. Participants enjoyed the site so repeatedly visited or recommended the site to others – the greater the number of visitors that undergo the positive experience, the greater the possibility that numbers of advocates for this type of environment may increase.

This section has highlighted that landscape that satisfies the user, and therefore receives positive response may contribute to peoples advocacy for the sustenance of and/or creation of similar landscapes in the future. To contribute to the future sustainability of this earth, the creation of landscapes that support sustainability ideals and that obtain this positive response may be beneficial. This advocacy in itself is a contribution to sustainability learning that does not rely on a formally recognisable learned outcome.

5.3 Discussion summary

Landscapes can be designed to direct Learning for Sustainability in a number of ways. The process of design is an influential factor that has the potential to direct and enhance user understanding and value of the landscape in question (or like landscapes). Whether intended or not, the designed landscape employs numerous experience-based stimuli that are important features of any learning environment. Knowing that these learning stimuli exist, it is easy to assume that for the Landscape Architect to enhance the Learning for Sustainability potential of a landscape they must to contribute to an identifiable learned result; that they must enhance user understanding about sustainability. However discussion has highlighted that while the designed landscape *can* be used to extend knowledge about these ideas and processes – which is indeed a positive learning outcome - landscape-based Learning for Sustainability does not necessarily have to have a formally identifiable outcome. As long as the designed landscape is presenting positive sustainable ideas or functions a contribution to sustainability learning is made.

In a number of instances this discussion has indicated that the design of landscapes can influence Learning for Sustainability at different scales. Participants of landscapes without explicit learning intent such as Waitangi Park may be subject to sustainability learning that relates to the wider scale environment – they can obtain unconsciously learned sustainability-focussed values. In sites of explicit learning intent such as Paradise Valley Springs participants are likely to leave the site with an extended knowledge of sustainability-based functions and processes because of the explicitly directed learning possibilities offered within the site.

Every designed landscape possesses a learning component. As sustainability is a topical issue in society it is likely that the public will have knowledge of some of the issues. This thesis has focussed on the realm of ecological environmental sustainability, as it is an area of sustainability that maintains a strong relationship with the physical landscape. The Landscape Architect may now understand that the public can, and will reflect on sustainability issues within their landscape, resulting in positive or negative views of those landscapes. The Landscape Architect therefore holds responsibility to design in a way that will ultimately support the sustainable drive this world requires. To do so, they can design to contribute to the understanding of, and advocacy for, the natural environment.

So, is it vital for landscape users to have a one-hundred-percent understanding about sustainably focussed site functions if they are to be educated for sustainability? Yes and no. On the one hand recognition surely increases understanding of programmed educational outcomes so improves the likelihood that obvious connections with previous experiences can be made, influencing understandings and values for sustainability. And on the other, the designer that influences positive sustainability-based behaviours, and advocacy for sustainability-focused sites, is achieving a positive contribution to sustainability learning.

Discussion of this research has illustrated that a number of the practices and theories that Landscape Architects will have learned about or been exposed to throughout their study or career are in essence learning tools. When creating a landscape, the designer is influencing and directing public Learning for Sustainability by way of theories and practices that contain learning stimuli and/or cues. An increase in understanding of the process of design, the utilisation of design theories and practices, and of the stimuli that are activated that influence learning, will enable the Landscape Architect to better contribute to the opportunity for Learning for Sustainability within the public landscape.

Chapter Six

Conclusions

The designed landscape is highly influential in Learning for Sustainability – it is a place of experience that guides learning by activating learning stimuli. The Landscape Architect is in a prime position to ensure the potential of the designed landscape is maximised in this role; they have a skill-set that includes tools through which they can and will have an effect on Learning for Sustainability.

This research explored the objective to investigate and formalise the role of the designed landscape in Learning for Sustainability, to provide an increased understanding of theoretical and practical site design techniques and strategies that can be utilised by the Landscape Architect to aid in this area. Conclusions were reached by responding to two research questions: 'How is learning for sustainability theorised, applied and implemented in the scholarship and practise of Landscape Architecture?' and 'How does the designed landscape direct learning outcomes in relation to ecological environmental sustainability?'

Chapter one, the introduction, highlighted that a population better educated on sustainability will better serve a sustainable future, and revealed that the Landscape Architect has a role to play in this sustainability-focussed learning of the public. However on exploring Landscape Architectural and education-based literature it was revealed that the link between Landscape Architecture and Learning for Sustainability was missing – the literature is not framed in a way that links the two areas. Further exploration into this area identified a binding characteristic between the Landscape Architectural and learning/educational disciplines: experience. It has identified that when Landscape Architectural theories and practices are applied to the landscape they form a space in which Learning for Sustainability occurs through user experience. This research has extended the reach of Landscape Architectural literature, which can now formally acknowledge that landscape-based Learning for Sustainability is contributed to on application of certain Landscape Architectural theories and practices.

In response to the first question, 'How is Learning for Sustainability theorised, applied and implemented in the scholarship and practice of Landscape Architecture?' the literature review revealed that, although not formally recognised, the Landscape Architect is involved in the direction of Learning for Sustainability through the design of the landscape - a place of experience-based learning. It highlighted seven theories and practices that appeared to influence Learning for Sustainability: immersion and acclimatisation, place specific design and sense of place, landscape narrative, site layout/organisation, eco revelatory design, sensory design and the choice of materials, and interpretation. It indicated that implementation of these implicit and explicit learning-based theories and practices can influence, shape and direct experience and therefore learning.

The case studies – Waitangi Park, Wellington, and Paradise Valley Springs, Rotorua – further explored the learning impact of these theories and practices. Site participants were a central focus of the studies, meaning that direct access to user experience was gained. The results of the fieldwork were consistent with the findings revealed in literature, suggesting the designed landscape is indeed influential in Learning for Sustainability. Participant responses highlighted that through design, the Landscape Architect has an influence on learning, though as a contributor to a multifaceted learning process rather than as the sole educator. This field work, in conjunction with literature, provided a response to the second research question 'How does the designed landscape direct learning outcomes in relation to ecological environmental sustainability?' by reinforcing that experience of the landscape plays a large role in Learning for Sustainability; learning occurs through the manipulation of experience, which in turn triggers five key learning stimuli. The stimuli are emotion, context, repetition, active

engagement, and advocacy. Triggering these stimuli results in experiences that direct user understandings and values of sustainability and/or promote user advocacy for future landscapes that maintain a focus on sustainable ideals. The Learning for Sustainability outcomes are those understandings, values and advocacies that have resulted from experience of the designed landscape.

This research explored landscape-based learning possibilities beyond the signboard. It has shown that if the landscape is designed appropriately, it can transcend the signboard approach to education. By applying the seven experience-based theoretical and practical approaches to design, the Landscape Architect can have an impact on the short and/or long-term Learning for Sustainability of the landscape user. The design process, along with the seven theories and practices activate the five key learning stimuli. The result is that landscape users learn *about* sustainability and/or learn *from* their use of the sustainability-focussed landscape. This research has also revealed that the public enjoy self-recognition of their learning, meaning that didactic methods for learning employed in support of those stimuli, such as signboards, remain a valuable tool in fulfilling this desire. Triggering the learning stimuli and supporting them with cues to learning can amplify short and long term learning opportunities. The designer, with recognition that theories and practices of Landscape Architecture influence learning, and that those theories and practices can be supported by publically recognisable cues to learning can endeavour to utilise yet another layer of design through which Learning for Sustainability is supported.

This research makes use of and recognises ties between the theory of Landscape Architecture and education, highlighting possibilities for the designed landscape to reflect and support knowledge provided in public education and conversation, reinforcing that learning is a multidisciplinary and multifaceted process through time. The research has also established that even if the Landscape Architect does not intend to draw on the landscape for learning, they must be aware that the public will learn from their experience of the design - be that positively or negatively regarding sustainability. So on recognition that Learning for Sustainability is multidisciplinary and is an ingrained result of landscape experience, the Landscape Architect holds a responsibility to design in a way that will ultimately support the sustainable drive of this world. At the very least, consideration about how the site portrays sustainability issues is important if the Landscape Architect is to positively contribute to the societal movement toward a sustainable future. However the Landscape Architect could also endeavour to design landscapes that are themselves sustainable, focusing on for example the ecological costs of materials, implementation and project management. Or they could take a layered approach to design, providing learning opportunities within the landscape through which an understanding of the sustainable processes and techniques represented on-site is made possible. They could also offer places in which groups can be brought to learn. The Landscape Architectural discipline can fittingly contribute to the future of sustainability through the manipulation and inclusion of possibilities for learning in the landscape. This research concludes that to do so the Landscape Architect should design to contribute to user understanding and value of, and advocacy for the natural environment.

With regard to the above conclusions this research has exposed three key areas that the Landscape Architect needs to understand if they are to design to effectively activate landscape-based learning stimuli. Firstly about the introduction of explicit learning cues to the landscape; secondly about the implementation of designs that support the implicit value of the landscape in learning; and finally how to consider and include the landscape user during the process of site design. Awareness concerning the application of these areas and the effect they have on landscape-based learning stimuli will enable the Landscape Architect to better utilise the public landscape's potentials in Learning for Sustainability.

This research extends the Landscape Architect's knowledge relating to learning in the landscape. In knowing that designed landscapes are capable of influencing the user in either positive or negative ways regarding sustainability, another aspect of professional responsibility is highlighted – to contribute to the widespread sustainability push through consideration of the learning landscape in design. This research has presented a different way through

which the discipline can relate to and understand its potential in the learning landscape.

The research acknowledges that there will be changes in the sustainability knowledge and the sustainability focus of the public over time. As learning relies on context, changes in public knowledge and focus will affect how a site design works to aid in Learning for Sustainability through time. It is important that this research is not viewed as a static answer to the ways in which landscapes can be utilised for learning - the learning process is dynamic, and so are the ways in which the landscape can influence learning. This research should therefore be consulted as a contextual exemplar that provides a starting point for understanding the role of the Landscape Architect in this area.

This research started out by identifying that Landscape Architecture has a tie to learning/education through the phenomena of human experience. It explained that Learning for Sustainability in New Zealand and across the world is important if the push for a sustainable future is to be achieved, and highlighted the potential role of the Landscape Architectural discipline in this area. On recognising that the link between Landscape Architecture and Learning for Sustainability was not formally acknowledged in the academic theory and practice of Landscape Architecture, this research set out to explore and expand this new space. The findings have indicated that Learning for Sustainability is occurring on many levels in the designed landscape, be that through the influence of designer-programmed explicitly educational landscapes for learning, through the implicit learning values of the designed landscape, or through the knowledge and understanding of the landscape user. It shows that landscape-based learning occurs through user experience and that design can be implemented to positively affect this experience and therefore learning. By expanding the academic understanding of certain Landscape Architectural theories and practices – revealing that the application of them is influential in landscape-based Learning for Sustainability - this research has formalised the link between Landscape Architecture and sustainability education. It has highlighted an additional potential for the discipline of Landscape Architecture to be involved in the worldwide shift toward a sustainable future.

Epilogue

This thesis began with an anecdote leading you through your local botanic garden. After the anecdote it was explained that the experience you had might have affected your sustainability-focussed learning, questioning you about whether the way that you treat and understand the natural environment may have been influenced by your experience of the designed landscape.

The concept was introduced that, by designing spaces, the Landscape Architect is modifying user expereince and so is influencing user learning.

Having developed an understanding of this topic throughout this research, you can now understand the role of, and possibilities for the Landscape Architectural discipline to influence the Learning for Sustainability landscape.

You may now return to the anecdotal experience of your local botanic gardens and recognise those ways in which its design is activating your learning experience. As this research explained, learning occurs in different ways according to the individual. So while I may provide you with an idea as to how you are affected, it is up to you to personally decipher your learning experience. You may however better recognise specific aspects of the environment that the designer has, consciously or not, made use of that have influenced your Learning for Sustainability.

Here I guide you back through your botanic gardens. I present you with questions regarding possible ways in which you have learned, and regarding the ways that that learning may contribute to your sustainability knowledge.

"It is the beginning of autumn. Imagine entering your local botanic garden just as the trees are losing their leaves. Following a gravel path between the magnificent oak trees, you step around a late-blooming flower. It emerges from a soft area of dirt, on a section of pathway devoid of gravel – the metal now a small river-like braid in the grass; washed off the path by a steady rain earlier in the week. As you crunch through the newly fallen leaves, you tread on something hard - an acorn. You realise that the acorn has fallen from above, and looking up you notice many more nestled amongst yellowing foliage. The ducks that often follow you in the hope of a bread crust are now feeding by the stream, more interested in your recent discovery – the acorn must be a food source for them in the autumn. "How do you crack through that hard shell?" you question..."

Note the environment you have been immersed within, and the way that the carefully placed path and the introduced oak trees evoke within you an emotional response to your immediate environment. Note that the placement of the path allows you an active engagement with certain features of that environment – the trees, the acorns, the river and the ducks. The path leads you in a direction that encourages you to recognise the wildlife and their habitat. Having visited a number of times, you are able to notice the importance of this environment to the ducks – you are reminded that they make use of this environment in a different way to you, that seasonal changes evoke different habits in them.

Could this immersive environment have provoked your emotional response and your thought about what is occurring around you? Could it have contributed to your understanding about ducks and their habitat, or has it simply allowed you to recognise that wildlife inhabits the area and that this environment is important to them in a differing way to you? Does this mean you have an increased appreciation of the environment and the life it supports? Does following a path, a worldwide symbol of directed movement, remind you

consciously or subconsciously that you need to stay on track? Does it contribute to your understanding, your habits, that may see you picking and following paths of least disturbance to the environment in the future?

"...As the path winds lazily through the trees you enjoy what the gardens have to offer, especially noting the abundance of different birds foraging in the litter of leaves. The autumn foliage produces brilliant colour. There is a board explaining the life cycle of the oak tree. It is significant to the area - how interesting it is that the oak first produces acorns when it is 20 years old!"

Note how immersion in this landscape has led to your recognition of seasonal change. Are you visiting to witness the autumn foliage? How did you learn that the leaves turn yellow - during your years at school? Have you applied an understanding from elsewhere to this real-life context that in turn contributes to your understanding of seasonal change? And have you been encouraged to recognise the individual beauty of the seasons, once again contributing to your long-term understanding and value of your environment?

Why did you read the sign? Did you read it because it is a cue to you that there is something to be learned, or because there may be further interesting information for you to gather? Did that information contribute to your immediate knowledge, making you consider that that oak itself must be over twenty years old, or did it encourage you to take your children back to walk around the gardens searching for trees over twenty years old that produce acorns? Could this in turn contribute both your, and their long-term appreciation and awareness of the environment?

Note also how your positive emotional response may contribute to you seeking like places to visit in the future. Do you feel that this is a place designed for you to enjoy? Is it a place you are proud to associate with your city? Has the inclusion of the botanic gardens contributed to the area's sense of place? With these feelings, your experience of this intentionally designed landscape has likely contributed to your value of and advocacy for of these types of landscapes in the future.

As you may see, it is not imperative that you have any one distinct learned outcome – this landscape is designed in a way that guides you through a pleasant experience, while at the same time it may be contributing to your Learning for Sustainability. The learning experience all depends on you, as an individual. However you may now recognise that the ways in which this landscape has been designed have activated learning stimuli, and have influenced your learning experience.

Appendix

Questionnaire

Name of Project: Education for Sustainability in Landscape Architecture

You are invited to participate in a project called '*Education for Sustainability in Landscape Architecture*' by completing the following questionnaire, followed by a digitally recorded interview.

The aim of the project is:

- To look into the intent of the Landscape Architect in terms of Education for Sustainability (EfS), versus the subsequent understanding of the user(s).

- To determine a range of successful principles of landscape design for EfS within New Zealand and provide additional possibilities for future design.

- To relate these principles to New Zealand based case studies to gain an insight into how design for EfS is being achieved within New Zealand.

- To collate important theory and practical responses in Landscape Architecture in terms of design for EfS.

The questionnaire is anonymous, and you will not be identified as a respondent without your consent. You may only withdraw your participation, including withdrawal of any information you have provided, previous to 20 December 2011. If you complete the questionnaire, however, it will be understood that you have consented to participate in the project and consent to publication of the results of both questionnaire and interview with the understanding that anonymity will be preserved.

Participant number: *(for researcher to fill in)*

Please fill in the following:

Male / Female (*Please circle one*)

Age:

Occupation:

Country of Origin:

How often do you visit Waitangi Park/ Paradise Valley Springs?

Daily / Weekly / Monthly / Yearly / First time (*Please circle one*)

How long have you spent at Waitangi Park/ Paradise Valley Springs today?

Less than 10 minutes / 10 – 20 minutes / 20 – 45 minutes / 45 minutes + (*Please circle one*)

Who accompanied you to Waitangi Park/ Paradise Valley Springs today?

Alone / My partner / My children / My family / My friend(s) / A tour group / Other

3-1 Questionnaire

Lincoln University Policies and Procedures

Consent Form

Name of Project: Education for Sustainability in Landscape Architecture

I have read and understood the description of the above-named project. On this basis I agree to participate as a subject in the project, and I consent to publication of the results of the project with the understanding that anonymity will be preserved. I give consent to participate in a digitally recorded interview. I understand also that I may only withdraw from the project, including the withdrawal of any information I have provided, previous to 20 December 2011.

Name: _____

Signed: _____ Date: _____

3-2 Consent Form

Interview Questions:

Why are you visiting this site today?

Has education been a part of the reason you are visiting?
If Yes – For education on what?

Did you know that the site has been designed for the reasons of…(*insert reasons here*)?

If Yes - How did you know that / Where did you find that out? Do you read the signboards here?
If No - Have you heard about these ideas / processes anywhere? Where? Do you read the signboards here?

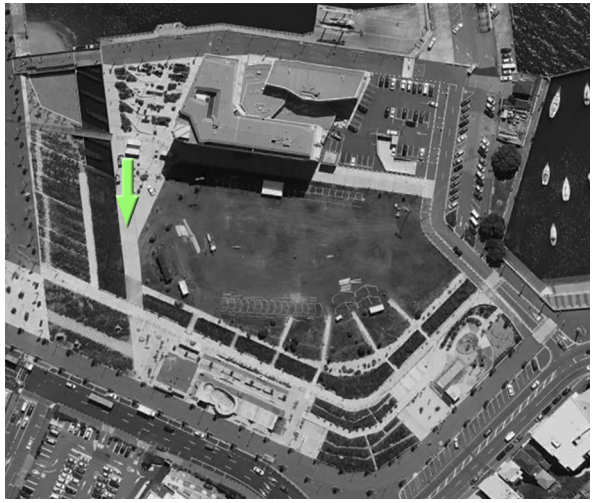
Are there any other sites that you have visited that also show these ideas / processes? Where?

Have you visited the part where (*point or describe*)? Are you familiar with that as a sustainable process? How/where have you learned about that process either here or away from this site?

What is your favorite part of this site? Why? Have you learned anything from it? What?

Is there anything that you experience around this site that you have trouble understanding?

3-3 Research Information Sheet



Waitangi Park

Paradise Valley Springs

3-4 Initially selected interview locations: Waitangi Park and Paradise Valley Springs (Google Earth, 2012)

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