Learning for Survival, Resilience, Well-being and Continuance:

An Epistemology and Pedagogy for Environmental Education/Education for Sustainability informed by Māori Culture

David John McKay

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ABSTRACT:

The literature suggests that philosophies, worldviews and approaches of indigenous cultures may be key to an urgent shift in paradigm towards holistic ethics, attitudes, values and behaviours essential for an ecologically sustainable future, if not humanity's survival.

This thesis presents an empirical study engaging a grounded theory methodology (Glaser & Strauss, 1967) that investigated how 'environmental education' (EE) or 'education for sustainability' (EfS) or its equivalent, is conceptualised, understood and practiced within Māori culture. This research sought to identify ways in which understandings and approaches informed by Māori culture might help address epistemological and pedagogical gaps in mainstream EE and/or EfS.

Sixteen questions were posed during face-to-face (kanohi ki te kanohi) interviews with 14 tāngata whenua (people of the land) participants, 7 male and 7 female, representative of hapu and iwi throughout Aotearoa-New Zealand.

The findings of this research indicate that the ultimate goals of Western perspectives of EE/EfS underpin Māori cultural perspectives of learning, attitudes, values and behaviours. An intrinsic, holistic epistemology and pedagogy for EE/EfS informed by Māori culture has emerged in the context of Aotearoa-New Zealand, which addresses key epistemological and pedagogical gaps identified in mainstream Western EE/EfS literature.

The epistemology for EE/EfS informed by Māori culture that has emerged from this research and is presented in this thesis is fundamentally different from mainstream Western models. Rather than EE/EfS 'in', 'about' and/or 'for' the environment, all living and learning informed by Māori culture is understood to occur 'as' or 'as

part of the environment'. Pedagogy arising from this epistemology informed by Māori culture includes a clear, engaging and relevant (Sauvé, 1999) purpose for holistic education and learning that is focused upon equipping individuals and communities with knowledge, values and skills for life: for survival, resilience, well-being, and continuance. The key objectives for learning are individual and community well-being and resilience. A flexible curriculum informed by Māori cultural values, as articulated by participants in this research, arises from a base or framework of core life-skills embodying EE/EfS. Synergies are identified with the National Curriculum (Ministry of Education, 2007a), Action Competence theory (Jensen & Schnack, 1997), and the *Enviroschools* Programme (Enviroschools, 2013), with potential. A conceptual model illustrating the epistemology and pedagogical framework is presented and explained. The nature, purpose and objectives of the emergent epistemology and pedagogy embody community resilience.

Further it has been found that meaningful integration of principles and values informed by Māori culture in EE/EfS guidelines and policy (e.g. Eames and Chapman, 2008) is not workable so long as such guidelines and policy are founded upon mainstream Western perspectives and assumptions. This research concludes that meaningful integration of mainstream Western perspectives upon holistic frameworks would be workable – particularly in a progressive transitional process.

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Another major hurdle has been recovering my personal life over six years following an acrimonious divorce, including several court battles

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No reira:

Unuhia, unuhia, unuhia!
Ki te uru tapu nui,
Kia watea, kia māmā, te ngākau, te tinana, te wairua i te ara takatā
Koia rā e rongo,
Whakairia ake ki runga
Kia tina! TINA! Hui e! TĀIKI E!

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GLOSSARY OF KEY MĀORI TERMS

This study is centred in Aotearoa-New Zealand, where Māori are tāngata whenua and te reo Māori is the indigenous language. It investigates Māori perceptions of Western concepts and constructs and, conversely attempts to frame Māori perceptions, understandings, concepts and constructs in a way that is accurately conveyed for Western understanding. It would therefore be useful for the reader to become familiar with and have ready reference to, meanings of Māori terms employed in this thesis.

Ako	'to teach and to learn' - reciprocal learning (Bishop, 2003, p. 227)
Atea	space
atua	usually translated as god but, more correctly, ancestors whose mana is extant, usually in a specific domain
hapū	sub-tribe
hau	the vital essence of mankind, obligation to reciprocate
hau ora	the first breath imbuing life
Hawaiki	traditional homeland
Hineahuone	the first woman created from clay by Tāne
iho	umbilical cord
iwi	major tribe
kai	food
kaihaumi	one who is without manawhenua, who takes resources without authority
kaitiakitanga	stewardship
karakia	invocation/prayer
koroua	old man
kaumātua	elders
kaupapa	philosophy, way of thinking, strategy or rationale
kawa	correct procedure or way of doing things
kuia	old lady
kutai	mussel *Perna canaliculus*
mahi	task, undertaking or activity
mahi kai	food harvesting/preparation

mahinga kai	place where food is obtained
mana	prestige or power implanted by atua in all things
mana moana	equivalent to mana whenua as it applies to the sea and its resources
mana tāngata	power acquired by an individual according to their ability to develop skills and gain knowledge in particular areas
mana whenua	the right to harvest, or make decisions over, resources in an area
Mana whenua/Manawhenua	the people who hold the mana whenua
marae	meeting area or focal point of a community
mātauranga Māori	knowledge and values
mauri	life force or essence, the life principle / conduit by which the mana of ancestors may draw near
mauri ora	state of conscious life
ora	alive, well
oranga	health, welfare
Papatūānuku	The Earth mother
pou	upright post, support, pole
poroporoaki	farewell
ngārara	insects, creepy-crawlies, reptiles
noa	free from sanctions (relative to tapu)
nohoanga atua	resting place of atua (often equivalent to mauri)
rāhui	to restrict access
rangatahi	modern youth or a new fishing net
Ranginui	The Sky father
rangatira/rakatira	person of chiefly rank
rohe	tribal or hapū territory
rōpūtanga	the ways of working together as a group or society
rūaumoko	atua with domain over earthquakes
taonga	treasured thing
Tāne-mahuta	atua of the forests and birds
tāngata whenua	people of the land/the people belonging to a locality
tangi	a funeral, to mourn/lament
tapu	involving sanctions, similar to being 'sacred'

Te Ao Hurihuri	The world of confusion
Te Ao Marama	The world of light and enlightenment
Te Kore	The nothingness or void or the 'great potential'
Te Po	The darkness or the night
Te Taiao	The universe and world, or everything that is nature, of the 'now'
tikanga	correct way, rule
toheroa	shellfish
tohunga/tohuka	expert, especially in ritual
tuakana	older brother (of male), older sister (of female), senior, cousin
tupuna	ancestor, grandparent
turangawaewae	home turf; place of belonging and familiarity
tutu	to learn by a process of trial and error
urupā	cemetery
wāhi tapu	sacred place
wairua	spirit, soul
wānanga	series of discussions, learning, occult science
whakapapa	genealogy
whakataukī	proverbs
whānau	family

(Williams, 2004; Williams, 1957; Ryan, 1997; Whangapirita et al, 2003)

LIST OF ABBREVIATIONS

BOT	Board of Trustees
DSP	Dominant Social Paradigm
EE	Environmental Education
EfS	Education for Sustainability
IEEP	International Environmental Education Programme
M.f.E.	Ministry for the Environment
M.o.E.	Ministry of Education
NEFS	National Education for Sustainability
NGO	Non-governmental Organisation
RMA	Resource Management Act 1991
UN	United Nations
UNCED	United Nations Centre for Environment and Development
UNEP	United Nations Environment Programme
UNESCO	United Nations Education, Science and Cultural Organisation

PART 1:

SETTING THE SCENE

1.0 INTRODUCTION

1.1 Introduction

Māori are the indigenous peoples, the tāngata whenua (people of the land) of Aotearoa-New Zealand. This thesis is the product of a journey by a pākehā (an Aotearoa-New Zealander of European descent) seeking to learn from and understand perspectives, understandings and values of Māori culture. As such I believe it is appropriate for me to position myself in context of what I understand of kaupapa Māori.

Accordingly in this chapter I will first introduce who I am, where I come from and how I view and approach the task of researching and writing this thesis. I will explain why I believe this study is necessary and important, before describing what is laid out and discussed in this thesis, how, why, and in what order.

With respect, the following narrative introduces myself and contextualises my position as the researcher in this research. It displays the sources of my inherent bias, as is appropriate in the ways of science. It also respectfully substantiates my identity, perspective and qualification to speak on issues addressed in this thesis, as is appropriate to the ways of Māori.

1.2 Mihi: Where I Stand

Ka taki te karearea, ka taki te kea, ka taki hoki au! Ti hei mauriora!
(The falcon cries, the kea cries, I also cry out: behold there is life!)

I have become familiar with and have great respect for what I understand of Māori culture, and have received gifts of insight and wisdom in many forms, including exposure to whakatauki passed to me by Dr. Hauiti Hakopa and also by Abraham Witana, to help my understanding of " . . . the qualities of modesty and humility in a person . . ." that are valued within perspectives informed by Māori culture:

Ehara te kumara e korero mo tona ake reka
(The kumara does not boast of its own sweetness)

(Dr. Hauiti Hakopa, 2011, p. 2)

I recognise, understand and respect the caution in this whakatauki conveyed to me by these gentlemen, regarding the honour of knowledge from within the inner sanctums of various iwi being shared with me, a pākehā and outsider – something the whakatauki cautions against. I am humbled.

I belong to the hills, mountains, grasslands, forests and lakes of Central Otago. The mountain ranges I anchor my travels to are known as Leaning Rock (Haehaeata), The Old Man Range (Kopuwai) and behind them, from where I stand, the Remarkables (Tupuaenuku). I am pākehā, and fortunate to be son of Colin and Esther, fantastic parents, both of whom are respected teachers. I am brother to Bruce and Trudy-Jayne, father of Louis, Wilson and Tim, and partner to Hana. This is where I stand.

Many decades ago, at age 13, I was up to my armpits in 44 gallon drums of 245-T solution, 'dunking' the root bundles of hundreds of sapling fruit trees, in preparation of planting. My then next door neighbour and weekend employer had demonstrated, bare-armed and T-shirted, with cotton pants, how to "get it right down in there", breaking up bundles of saplings and plunging and splashing individuals, twos and threes deep into the mix. It was never discussed as to what the substance was. No protective gear was offered or even likely considered as perhaps necessary; it was not uncommon for spray-gear to be never-washed cotton overalls and a towel hat, in those days. I was young, trusted adults on the assumption that they 'knew stuff' and was keen to prove myself a hard worker and, as was valued in my community, a 'hard man' – unperturbed at a little chemical wetting. I got 'stuck into it'.

I am now 50 years of age. Since my twenties, I have carried 'lumps' throughout my body. Every two years, these lumps are counted, measured, mapped, stuck with rather nasty hollow needles and biopsied. At last count there were 62. So far all have proven benign; including the two that were in

doubt and were removed. It is a painful routine, one I stick to religiously, and have shared with many of the 'kids' I grew up with or who came from the same area or similar communities. I say 'shared' in the past tense because many of these people, my friends, neighbours, acquaintances and their children, have ailed and died: cancers, mostly. Why is this? What might explain my lumps, the rampant cancers in my country community - a not uncommon story amongst agricultural and primary industry communities in Aotearoa-New Zealand?

245-T, or 2, 4, 5-trichlorophenoxyacetic acid (Dwernychuk et al., 2002, p. 118) is a synthetic auxin; an artificial hormone that stimulates and/or regulates plant cell activity and growth. Its hormonal nature stimulates such rapid growth of cells that the plant self-destructs. 245-T was widely used in orchard establishment, and similarly throughout society, since the early 1950s as a 'root-dunk' pre-planting treatment for saplings and for weed control, up until the late 1980s in Aotearoa-New Zealand. 245-T is more commonly known as a weed-spray and defoliant, and one of the ingredients in the infamous 'Agent Orange' used in the Vietnam War. Like many substances widely and wantonly applied for agricultural, domestic and other developmental activities whose harmful effects upon humans have been retrospectively proven and accepted, 245-T is now a globally banned substance. 245-T is acknowledged to be linked to serious negative health effects and ecological damage (Dwernychuk et al., 2002, p. 118), and is linked to cancers in humans[1] (Dwyer & Flesch-Janys, 1995).

245T is just one of all manner of toxins, contaminants and questionable practices I have been exposed to in work and everyday life, producing food, eating, in medical treatment, in building houses and amenities and in living and working in the same, and in controlling plant, insect and animal populations indoors and out. The abundance and nature of recollections of personal examples literally gives me the chills; birds as big as magpies pecking fruit, deliberately poisoned with dioxin, toppling instantly and dying; my Labrador's and my ears, eyes and lips swollen closed up as though

[1] PAN Pesticides Database, retrieved on 15 June 2012 from http://www.pesticideinfo.org/Detail_Chemical.jsp?Rec_Id=PC34514

stung by a swarm of bees after wading a flooded river lined with recently 245T-poisoned willow stumps; road maintenance crews dressed in shorts, soaking roadsides and river-banks in various herbicides; waterfowl dying within hours of landing on certain arsenic-oxidisation ponds; a water de-salination plant built on the site of a 'incident'-troubled nuclear power station[2]; and on and on it goes. I do not believe my experiences are unique; rather they are more likely a snapshot of the reality of the accepted and generally unthinking attitudes, values and behaviours of Western society interacting with the whenua of 'Clean-Green' Aotearoa-New Zealand and the Earth in general. Such incidents are so common that we don't even notice them or think about them, and if we do: 'she'll be right, mate'! My shifted awareness and horror at the simple logic of 'cause and effect' in what I have seen, has stimulated my drive to do something about it – particularly as father to three beautiful children.

David Orr (1992b) has described an environmental educator as being by necessity "a specialised generalist". This makes good sense to me and is what I have sought to become.

I hold several qualifications, each of which consolidate my position as an educator, covering education and teaching, parks and amenity design, wildlife conservation management, adult literacy and numeracy tuition, Antarctic studies and environmental education.

I bring to this research a range of perspectives that result from experience in a wide range of capacities outside of academia. I have lived much of my life in the high country and the bush of the South Island, mainly in Central Otago, yet there are few places on the whenua of Aotearoa where I have not trodden in one capacity or another. As an educator, I became very aware and concerned at, not only my own early work-life and health journey, but also an apparent lack of educational curriculum and content that sought to engender healthy attitudes, values and interactions with the environment amongst

[2] Digges, C. 2011. *Small-scale US Nuclear Reactor blamed for spiking Cancer Rates, Casting Pall over Russia's FNPP Fetish.* Retrieved on 18 June 2012 from http://www.bellona.org/articles/articles_2011/McMurdo_leaks; http://www.newsnet5.com/dpp/news/local_news/investigations/classified-documents-turned-over-related-to-leaking-mcmurdo-nuclear-plant-and-cancer-claims

learners and amongst society in general. I had also become increasingly aware, literate to and alarmed at, wide-spread examples of self-harming and environmentally damaging attitudes, values and behaviours that had become 'the norm', and of clear signs of accelerating environmental contamination and degradation in all areas of the built and natural landscapes in which I was working and recreating. It appeared to me then that a majority of people around me were, to a greater or lesser extent, oblivious or ignorant of, uncaring, accepting of, or misguided and an active agent in, compounding environmental decline. It horrified me that I was implicit in this. I returned to University and postgraduate study in 1996 in order to learn more and to try to do something about it.

My research for my Master's degree dissertation (McKay, 1998) explored individual definitions, understandings and practices of environmental education of twelve environmental educators in Canterbury, New Zealand, and compared these with the Ministry for the Environment's (M.f.E., 1996) description of environmental education. The literature review (McKay, 1998) identified:

- an urgent need for humans to change the way in which they interact with the environment, altering the dominant social paradigm (DSP), through environmental education;
- confusion regarding definition of environmental education, diverting attention from the mission of achieving change;
- that beyond fragmented efforts, little had been done in Aotearoa-New Zealand towards environmental education;
- a lack of government support in the form of coordination, training, guidance or networking;
- a [then] proposed national strategy for environmental education yet no environmental education policy (effectively 'a cart before the horse');
- official documents that reflect a problem-based DSP, based on an anthropocentric, Judeo-Christian ethic of stewardship of the Earth;

- that ecocentric philosophies were agreed to be more appropriate for the foundation of proactive, vision-based approaches to environmental education.

Results of the study (McKay, 1998) indicated that most descriptions of environmental education and its practices by environmental educators were anthropocentric and problem-based. While no descriptions were ecocentric, some were transitional: leaning towards ecocentric perspectives and understandings. The conclusion of the (1998) Master's dissertation recommended research to clearly identify a shared vision of the probable, possible and preferred environmental futures for Aotearoa-New Zealand, so that the objective is commonly agreed, understood and valued, and so that a strategy can be mapped, with contingencies, of how to 'get there'. It concluded that a strategy without a policy based on a clear vision and mission is directionless.

I spent several subsequent years attempting to make meaningful changes in schools, government agencies and corporates. There is a saying about brick walls and foreheads that sums up my experiences in this direction.

An invitation was extended, in 2007, by iwi representatives for my two children and I to participate in a rōpū, consisting of New Zealanders representative of each generation, to the United States to meet with First Nations representatives to discuss how the peoples of the Earth might work to together towards a common future. I became involved with the Environmental Risk Management Authority's (now the Environmental Protection Agency's) National Iwi Network, Māori communities and community groups, such as Sawmill Workers Against Poisons (SWAP). These interactions established relationships with Māori representatives and kaumātua throughout Aotearoa-New Zealand, and so insights into alternative perspectives, attitudes, values and interactions amongst people, communities and the Earth. It began to dawn on me that maybe if everyone shared such understandings and perspectives as those embodied in Māori and other indigenous peoples' cultural understandings, the Earth may far more likely be well. I began to speculate that perhaps a solution to the mounting human crisis might lie in indigenous understandings – and perhaps always has?

These experiences, with the observations, ponderings and questions that have consequently arisen, set me on this particular journey.

The opportunity to spend what has become more than 5 years researching a PhD thesis has given me a chance to revisit the literature to ascertain the reported state of and situation around the well-being of the Earth, and what progress has been made in shifting attitudes, values and behaviours in the fifteen years since the scrutiny of my last research, between 1996 and 1999. My initial review of the literature has established the starting points of this research, and is presented in Chapter 2 of this thesis.

I have been increasingly confronted with the alarming realisation that, in reality, much of what was observed during my 1998 study remains unchanged. Little has yet been undertaken or achieved that is likely to contribute to a meaningful shift in attitudes, values and behaviour - a shift in the dominant mainstream perspective - towards ecological sustainability within Aotearoa-New Zealand or perhaps in the wider world. My initial review of the literature indicated that most attempts at environmental education have been (and continue to be) prescribed and delivered from within the Western perspectives and values that are the very cause of the situation: from a reductionist, problem-based perspective as 'snippets' of information delivered as a topic that is an add-on to the curriculum (Coyle, 2005). This observation seems to me to defy logic.

Reflection upon what I had read in my initial review of the literature and upon what I had learned from my experiences as an educator and in other roles in my diverse career, and particularly from my interactions with Māori individuals and communities, led me to hypothesise that the sorts of thinking, valuing and behaving that are needed are potentially embodied in Māori culture. I set out to investigate this further. The process of researching this thesis has given me the chance to take my personal understandings and experience into dialogue with both wider literatures engaging with these issues and with an inspiring group of actual practitioners of embodied, indigenous environmental learning. The following chapters trace my

intellectual journey into a deeper engagement and understanding of the potential future of environmental education in Aotearoa/New Zealand.

1.3 Rationale and Purpose of the Research

This thesis is partly a response to critical gaps identified in the initial review of the literature regarding the adequacy of human response to the escalating global human-environmental crisis: firstly, that despite fifty years of efforts, particularly through environmental education and/or education for sustainability, no meaningful changes have been achieved, and; secondly, that holistic cultural epistemologies and pedagogies that are potentially key to achieving such urgent paradigm shifts are not considered, understood or included beyond episodic interpretation and integration within Western frameworks.

The overarching gaps identified in this research's reflection following review of the international literature are:

1. a need to recognise, agree and accept that the necessary shift of mainstream ways of thinking to holistic positions cannot be made using contemporary technocentric mainstream assumptions and frameworks (see such as Cullingford, 2004; Van Eijck & Roth, 2009);

2. a need to identify an appropriate holistic framework, pedagogy and strategy for transition;

3. a need to commit to and comprehensively engage the appropriate holistic framework, pedagogy and strategy.

Several scholars, including Te Aue Davis (1991), Michael King (2003) and Jim Williams (2004), have argued that Māori had developed an environmental or 'conservation' ethic, a culture and way of kaitiakitanga (guardianship) that facilitated the survival and well-being of the tāngata (people) and whenua (all that is the land) in Aotearoa-New Zealand prior to the arrival of Europeans. There is abundant evidence that to a greater or lesser degree, this

conservation ethic and connection with the whenua persists amongst Māori (Davis, 1991; Williams, 2004). The literature highlights that such an ethic is lacking in the mainstream Western worldview, and despite an increasingly evident urgent need (see, for example, the likes of Aronson et al., 2010; NAAEE, 2011a), efforts at establishing strong eco-ethics throughout the national and global community have been frustrated or ineffectual (Bolstad et al., 2004a; Eames & Chapman, 2008; Coyle, 2005). A key observation in the literature is of disconnectedness and environmental illiteracy in Western society (Campbell, 2001; Coyle, 2005), including amongst much of contemporary Aotearoa-New Zealand's society (Bolstad et al., 2004). Conversely, understandings of connection, inter-relatedness and interdependence and transferral of such concepts continues amongst many Māori (Durie, 2001; Panelli & Tipa, 2007; Royal, 2007). It makes sense to identify why this is and how it occurs so that the gaps in educational understanding and practice affecting human-environment perceptions, attitudes and values, interactions, relationships and well-being may be addressed. Evidence suggests that only once these things are achieved may an environmentally literate and responsible society be realised (Coyle, 2005; NAAEE, 2011a), with a hope of achieving a sustainable lifestyle and common future for humanity (Campbell, 2001).

A gap identified in the literature is an understanding and appreciation of environmental connections, inter-relationship and inter-dependence of living and non-living things (Aronson et al., 2010; Campbell, 2001; Lautensach, 2003; Oats, 2001). Few, if any, Western perspectives allow these understandings (Porritt, 1991; Fien, 2001). Perspectives of indigenous peoples throughout the world require a basic and intimate understanding of humanity as just one inter-connected and inter-related part of the environment in which a specific people survive and depend upon for survival – in many cases proven over several thousand years (Suzuki et al., 2007; Turner 2005). The recovery of this omission through education and a shift in worldview is key to humanity's survival and sustainability (Aronson et al., 2010; Fien, 2001; Lautensach, 2003). Leaders in raising awareness amongst the global community of the current global environmental crisis strongly suggest that indigenous perspectives, understandings and appreciations of inter-connection inter-

relationship and inter-dependence, such as within a Māori worldview, may be key in addressing the common issue of environmental futures and survival of humanity (Campbell, 2001). As Williams (2011, p. 10) suggests of Māori:

> All peoples, on earth, have made their environmental errors but it is instructive to focus on a group who seem to have learned from theirs and modified their society accordingly.

and:

> As society developed, lessons continued to be learned, contributing to an improved knowledge base. Appropriate management strategies were adopted as a consequence, leading to emergence of a genuine conservation ethic. This eventually became reflected in the very fabric of society, and was supported by the expression of key spiritual values such as mana, and tapu.

It therefore makes good sense, in the context of Aotearoa-New Zealand, to examine and understand not only the general Māori worldview, but also how Māori perceive and understand what is aspired to in the Western worldview as environmental education, and how such awareness, knowledge, understanding, connections, attitudes and values, skills, participation and motivations are transferred so effectively. Such understanding may lead to the identification, possible adaptation and/or development of an educational approach that helps bridge the gaps between the current DSP and survival, if not sustainability. The preceding paragraphs of this section describe the rationale of this research.

1.4 Research Purpose

The purpose of this thesis is to identify ways in which understandings and approaches informed by Māori culture might help address epistemological and pedagogical gaps in mainstream environmental education and education for sustainability.

1.5 Research Objectives

There are three objectives for this research:

a. To investigate, identify and describe how 'environmental education' or 'education for sustainability' or its equivalent in Māori culture is conceptualised, understood and practiced amongst Māori of Aotearoa-New Zealand.

b. To identify and describe strengths and opportunities that may be adopted, adapted or otherwise inform appropriate and meaningful integration of Māori understandings in environmental education (education for sustainability) policy and practices in Aotearoa-New Zealand.

c. To explore ways in which epistemology, pedagogy, tools or perspectives informed by Māori culture might help address gaps in environmental education (education for sustainability) epistemology, pedagogy, policy and programmes the context of education and learning in Aotearoa-New Zealand.

In order to meet these objectives, this research addressed the questions described in the next section of this chapter.

1.6 Research Questions

1. How is 'education for sustainability' or 'environmental education' or its Māori equivalent, conceptualised, understood and practiced and/or facilitated amongst New Zealand Māori and within Māori cultural perspectives?

2. How are key concepts within the constructs of 'education for sustainability' and 'environmental education' perceived and understood amongst New Zealand Māori and within Māori cultural

perspectives, and how does this affect their perceptions of the constructs?

3. What is the relationship between people and the environment and how does this affect Māori perceptions, understandings and transfer of knowledge relating to the environment and to a conservation ethic?

4. What can be learnt and gained from Māori cultural perspectives for education of communities and society towards ecologically sustainable lifestyles and practices in Aotearoa-New Zealand?

1.7 Methodology

This study was undertaken using qualitative research methods, mainly in the form of in-depth interviews and analysis using 'grounded theory' (Charmaz, 2006; Glaser and Strauss, 1967) and Berg's (2004) model of a 'spiralling research'. Other methods have included a review of the literature and comparison of education and environmental education research, policy and practice, as well as environmental literacy, in other countries. These methods and their application are described in Chapter 5 of this thesis.

In the process of this research I have drawn upon my own experiences as a teacher, environmental educator, researcher and citizen, and upon an initial review of international and Aotearoa-New Zealand literature to reflect, consider and identify a problem, as well as the starting points and initial theories that informed the first stages of this research. I then researched and designed a methodology appropriate to the research's nature and scope.

A group of fourteen tāngata whenua who are tohunga (expert), kaumātua (male or female elder), matua (male adult), whaea (female adult) rangatira (chief), kaitiaki (guardian) or individuals otherwise representative of hapu or iwi from throughout Aotearoa-New Zealand, participated in interviews during this research. Seven participants were male; seven female.

During the process of analysis of the interview data from participants in this research further theory was developed, which was tested against the literature and further analysis of the data in a spiralling (Manning, 1986)

action research process (Gloster, 2000), which has resulted in new theory and a new model grounded in the research.

This qualitative research approach has enabled an exploration of Māori cultural and personal experiences and perspectives, values and beliefs in a culturally appropriate manner.

1.8 Statement of Limitations

Every research is limited by an array of influences and variables. It appears rare for these to be comprehensively acknowledged in statements of limitation that qualify research, such as this which is surprising given the supposed objectivity of the contemporary reductionist scientific approach to investigation. Researchers so often appear to forget to stand back and intimately examine the frames of reference from which they posit reality beyond the conventionally acceptable.

In the context of convention, this research has a number of apparent conventional limitations including temporal, financial, logistical, geographical scope, social, cultural, linguistic, religious, conceptual, inter-personal, intellectual, philosophical, methodological, epistemological, pedagogical, which are acknowledged here.

As with all research projects, this study was restricted by limited time and resources. The sample size, type and its geographical distribution raised significant difficulties in logistics in and around events of busy people's lives, including illness and tangi, taking priority and frustrating opportunities for participation by many enthusiastic and generous participant tāngata whenua throughout the country. Thirty-two enthusiastic and generous potential participants agreed to take part in this research; of those, for one reason or another, only fourteen participants were able to be interviewed.

A major limitation of this research is that I am seeking to interpret and integrate Māori participants' perspectives and understandings of taha Māori, kaupapa Māori and mātauranga Māori without using Māori-focused methodologies. As a pākehā using pākehā methodologies to interpret and

integrate a robust representation of those Māori participants' perspectives and understandings of taha Māori, kaupapa Māori and mātauranga Māori, at least a degree of alteration is inherent in translation from one culture to another due to there often being no matching constructs and concepts from different worldviews and understandings of what is possible or impossible (Hart, 2010). For example, for a person with a worldview informed by Māori culture, the Earth is Papatūānuku and a direct ancestral relative of female gender, just as to a person with a worldview informed by Christianity 'Jesus' was the son of God who is the creator of all that is as it is, and as to a pure scientist the universe or 'all that is', is part of a perpetually changing accident of chance.

A further limitation in this vein is that the construct of 'Māori' is historically a recently emerged descriptor of the collective iwi (tribes) of a society whose pre-European culture was iwi-based, locally referenced and environmentally responsive (King, 2003, p. 77). As a result of this, different iwi and sometimes different hapu (sub-tribes) have different understandings, dialects and descriptors (ibid., p. 79). In other words, there is no one prescriptive 'Māori' set of understandings and approaches (Williams, 2004). While there are overarching and common perspectives such as in the example of Māori cosmology, there are different versions in the telling that are characteristic of different iwi and hapu (King, 2003; Williams, 2004). In the context of this research and how it has been designed and conducted, this has meant that a flexible and adaptive method and approach has been necessary to accommodate related variations in what has otherwise been presented as an essentialised Māori worldview.

Identifying individuals in the Māori community who have mana in this (or any) area can be difficult: people of influence or position are not promoted or advertised or made public outside of hapu or iwi other than by reputation. Often it is difficult for an outsider and even for younger members of an iwi, trying to gain insights into traditional ways and reasons for particular kawa, to ascertain who best to speak with and how, and then to understand what it is that they have been told. Further, as explained in the first section of this

introduction in relation to humility, it is not tika (correct) for individuals to self-promote, and not all information is for sharing.

I have learnt that kaumātua often talk in esoteric ways, protecting information with cryptic deliveries so that only the initiated or those who are 'ready' to receive the true meaning, actually understand. It has been necessary to find appropriate opportunities to ask a senior kaumātua (respectfully) to help by identifying who they believe best to start with, in the knowledge that each in any given list will have a wealth of others to network with. A further limitation extending from this lies in the extent to which I might be considered to have demonstrated trustworthiness and readiness to receive information and be referred on. The scope of this study has therefore also been limited to who I have approached and how appropriately I have gone about interpreting and applying the advice received.

Language and cultural constructs are also limitations in this research. This research investigates Māori perceptions of Western concepts and constructs and, conversely attempts to frame Māori perceptions, understandings, concepts and constructs in a way that is accurately conveyed for Western understanding. It is therefore very important for the purposes of respect and of this study that all efforts are made to avoid approximations and mis-interpretations and inaccuracy. This being said, it should be noted that there are Māori words that hold meanings and describe concepts that may not have an equivalent in English, such as 'kaitiakitanga' – the closest English approximation of which is 'stewardship'. Conversely, as is illustrated in the data of this study, English words – such as 'sustainability' - may not fit neatly or meaningfully within a Māori worldview. Indeed, as is apparent in the literature, English words – such as 'sustainability' – may not even have a commonly agreed or stable meaning in English (Jacob, 1994; Lautensach, 2003; Sterling, 2001).

1.9 Approach to Language

This study is centred in Aotearoa-New Zealand, where Māori are tāngata whenua and te reo Māori is the indigenous language. As required under The Māori Language Act, 1986, te reo Māori will be given equal status with

English in this thesis. Accordingly I have chosen not to underline or italicise te reo Māori in this thesis.

Where te reo Māori is first used in the text, the word or phrase will be translated and included in the glossary. Where te reo Māori is used in quotations, unless the participant interprets the word or phrase themselves, the translation will only appear in the glossary. Where a dictionary has been used to translate a Māori term, an appropriate reference is made. Where te reo Māori has been used in a quotation, the particular participant has been asked to check and confirm the accuracy of the quote, as well as provide a translation.

1.10 Structure and Outline of Thesis

This thesis is presented in four parts. Part 1 includes this introduction and a review of the literature to contextualise and position this research. Part 2 of this thesis describes the research design and methodology, Part 3 presents the results, and Part 4 discusses findings and conclusions. What follows is an outline of each parts' chapter content. With the exception of this introduction, each chapter in this thesis is preceded with a map of its location in the thesis structure, as illustrated below in Figure 1.

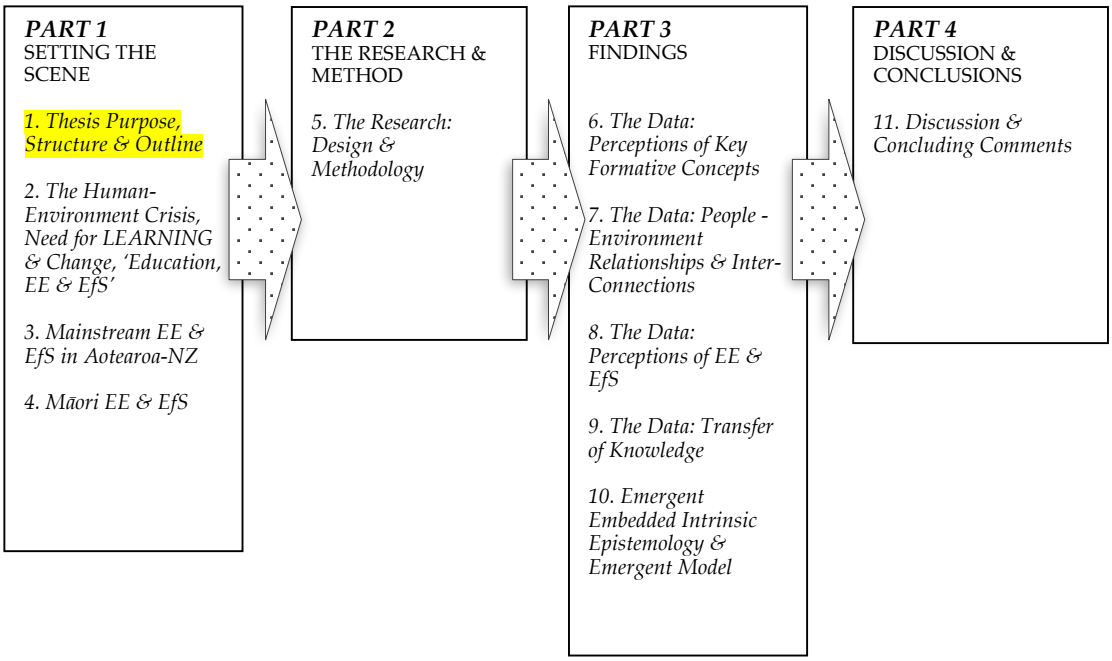


Figure 1: Thesis Structure

The following subsections describe a summary of each chapter of this thesis.

1.10.1 The Introduction

Chapter One has established the context of this study with its rationale, purpose, objectives, and the research questions. The methodology, research limitations, and approach to language lead to an overview of the structure and content of the thesis.

1.10.2 The Literature Review

A review of the literature is divided into three chapters in order to provide a background, establish starting points and position this research.

Chapter two establishes the need for this research due to inadequate response of mainstream Western society to the mounting global human-environment crisis due to gaps in 'environmental education' and 'education for sustainability' (henceforth EE/EfS) that are critical to achieve ecologically sustainable lifestyles and futures. The development and current status of EE and EfS are reviewed, leading to consideration of what might be learned from

the accumulated knowledge represented in indigenous cultures and, specifically, Māori culture.

Chapter three describes the status quo of mainstream Environmental Education and Education for Sustainability in the context of Aotearoa-New Zealand.

Chapter four of this thesis explores the literature for evidence of the specific understandings and practises described in Māori culture that equate to EE/EfS.

1.10.3 The Research and Methodology

The fifth chapter of this thesis describes the research and methodology, what the study set out to establish, where, when, amongst whom, how and why.

1.10.4 The Data

The data resulting from this research is presented in five chapters.

Chapter six describes the interview data addressing participant descriptions of key terms and concepts that shape understanding and descriptions of EE and EfS.

Chapter seven presents interview data that describes participant understandings of human-environment inter-connectedness and relationships.

Chapter eight describes participants' interview data addressing participant perceptions of EE/EfS.

Chapter nine presents participant interview data describing the process and mechanisms informed by perspectives of Māori culture as represented by participants in this research that transfer knowledge that equates to the objectives of mainstream EE/EfS.

Chapter ten presents participant interview data that illustrates an intrinsic epistemology and pedagogy for EE/EfS that is embedded in Māori culture as articulated by participants in this research.

1.10.5 Integrated Discussion and Conclusions

The findings and implications of this research are discussed towards conclusions and new theory grounded in the research in Chapter eleven of this thesis.

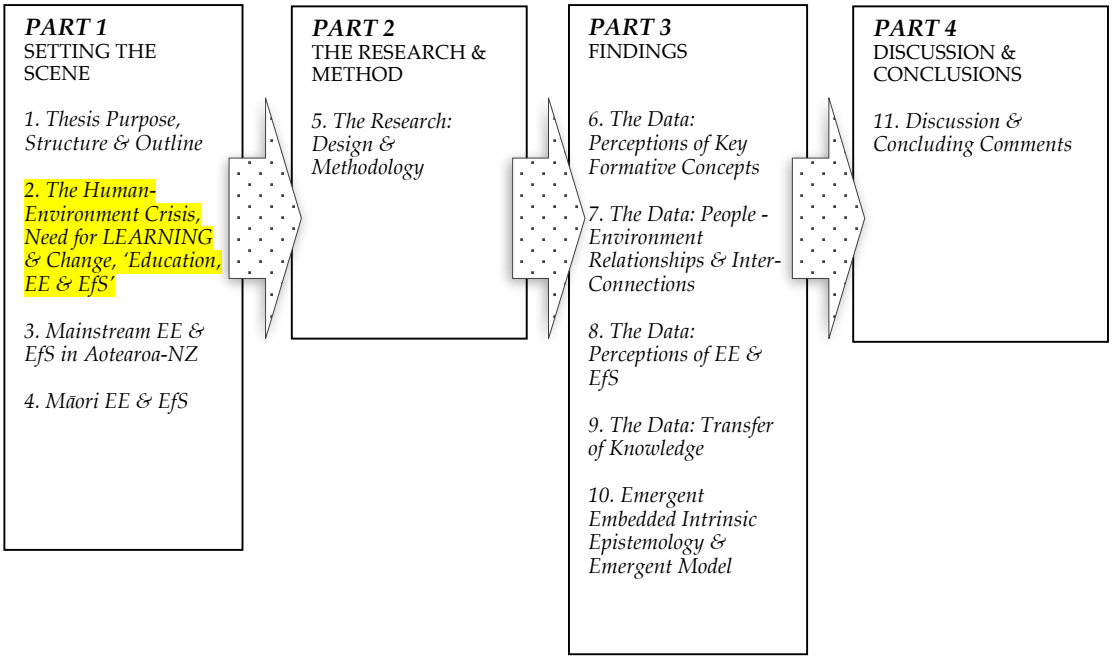
A glossary of key Māori terms is provided, as well as a separate glossary of other terms, following the table of contents, list of tables and figures, which is followed by a list of abbreviations and their meanings.

Appendices are presented at the rear of this thesis, immediately following the bibliography, including examples of an information sheet for participants, a consent form, and a question schedule for the interviewer.

1.11 Chapter Conclusion

This chapter has briefly introduced my own personal journey that led to the initial questions posed within this thesis. These questions are empirically situated in Aotearoa-New Zealand and ask how 'environmental education' (EE) or 'education for sustainability' (EfS) or its equivalent in Māori culture is conceptualised, understood and practiced amongst Māori and might help address epistemological and pedagogical gaps in mainstream environmental education and education for sustainability. A Grounded Theory methodology and qualitative methods are employed to address the research purpose, objectives and research questions. From here, the wider context of academic literature that informs the thesis will be presented and reviewed. The following chapter will focus on a series of key claims in the international literature including: the need for a shift in paradigm through education, and in particular EE/EfS; that this is not being meaningfully achieved; why and what needs to be done, and by whom and how. It will provide the wider context to understand Aotearoa-New Zealand's position and stance with regard to EE/EfS and the need for meaningful change, as well as the position of Māori culture within related contemporary epistemology and pedagogy.

2.0 POSITIONING THE RESEARCH



The challenges are great, and the stakes are high.

(Colin Power, 2001, p.21)

2.1 Introduction

The purpose of this thesis is to identify ways in which understandings and approaches informed by Māori culture might help address epistemological and pedagogical gaps in mainstream environmental education and education for sustainability. This research uses a qualitative method of inquiry with a grounded theory approach to data collection and analysis (described in Chapter 5 of this thesis). The structure and overview of this thesis have been introduced in chapter one.

This thesis initially responds to and seeks to address, two gaps identified in the literature regarding the adequacy of human response to the escalating global human-environmental crisis (see such as Flannery, 2005; Leiss, 1994; NAAEE, 2011a; Roszak, 1992; Suzuki et al., 2007). The starting point identified

in the literature is that, despite widespread agreement for the need for an urgent paradigm shift towards holistic ethics, attitudes, values and behaviours that have been advocated and coordinated by the United Nations over a period of fifty years (see such as UNESCO-UNEP, 1976; UNESCO-UNEP, 1978), no meaningful changes have been achieved. Furthermore, while the literature strongly suggests that holistic philosophies, worldviews and approaches embodied in indigenous cultures may be key to achieving such urgent paradigm shifts and environmental responses, specific cultural epistemologies and pedagogies are rarely researched. Nor are they considered, understood or included in contemporary EE or EfS policy or practice, beyond superficial statements (see such as Bolstad et al., 2008; Brignall-Theyer et al., 2009; Chapman, 2004c, 2011; Gough, 2006). This research seeks to meaningfully address these gaps in one case of indigeneity, in the context of Aotearoa-New Zealand. This chapter will position the research in terms of its background and context within which it sits so that its contribution, applicability and significance.

This chapter will first introduce the need for this research in the context of the mounting global human-environment crisis. Next, the nature of and rationale for urgent, comprehensive and fundamental change will be described. Education, and in particular environmental education (EE), will then be introduced as a critical platform for achieving such change. Next, reasons why meaningful change has not yet occurred or perhaps even progressed meaningfully despite awareness of the threat posed to humanity by the global condition and agreement for the nature and need. An overview of EE and the emergence and current status of education for sustainability (EfS) will follow. A description of gaps identified in the literature as critical to achieve ecologically sustainable lifestyles and futures then leads to consideration of what might be learned from the accumulated knowledge represented in indigenous cultures and, specifically, Māori culture. Ten starting points emerge from each section of the review of the literature presented in this chapter, grounding the research's theoretical development and line of inquiry. A summary of these emergent key starting points led to this chapter's conclusion.

The following section will introduce the global human-environmental crisis as a background to and starting point for the rationale and development of this research.

2.2 Global Human-Environmental Crisis

The global human-environmental crisis is well documented in contemporary literature. This not-withstanding, for the purposes of this thesis it is important to note the nature and severity of the environmental condition, what is causing it, with what implications and some key potential remedies. This section of the thesis will provide an overview of the human-environmental crisis, humans' role in its eventuality, its threat, and what needs to be done, as a background to the nature, direction and importance of this research.

It is clear from the literature that the planet Earth, humans' only home, is not well (see for example, Brundtland, 1987, 1990; Campbell, 2001; Club of Budapest: Worldshift Network, 2008; Diamond, 2003; Gilding, 2012). Evidence, such as described by Corti et al. (1999) and the United Nations' (2005) *Millennium Ecosystem Assessment*, suggests the Earth's environment is stressed and critical elements, including air, atmosphere, water, soil and ecological systems, have degraded and continue to degrade at global, national, regional and local levels. Leading opinions (see, for example Attenborough, 1991, 2010; Club of Budapest, 2008; Foley, 2010; Ramphal, 1990; Suzuki et al., 2007) have expressed concern that the health and viability of the very elements that provide for the basic biological needs of humans and other life on the Earth, are in decline and under threat of collapse.

Widespread concern is also expressed within the literature by writers such as Diamond (2003), Foley (2010) and Gilding (2012), that the mounting human-environmental crisis threatens the continued well-being of humanity as well as much of the biodiversity of the planet. The threat to humanity of the global human-environmental crisis is a starting point for this research.

It is equally clear in the literature and oral histories that humans have played a large part in the declining condition of the Earth (see, for example, Gluckman, 2010; Lautensach, 2003; Porritt, 1991; Simmons, 2008). Nancy Turner (2005, p.1), for example, suggests that much of today's environmental

damage is a direct result of poorly considered use of technology and the impacts of this technological mind-set: through unsustainable attitudes, values, behaviours and practices amongst human beings. Sterling (2005) and others argue that the status quo, the way we currently do things within mainstream Western society, is simply not sustainable. A common sentiment within the literature (see, for example, Aronson et al., 2010; Lautensach, 2003; Ramphal, 1990; Simmons, 1991, 2008) is that there is urgent need for change in human attitude, values, behaviour and the way in which we interact with 'the environment' for there to be any hope of long term solutions and perhaps, inevitably, human survival. That there is an urgent need for comprehensive change is a second starting point to this research.

Having established it is widely agreed there is a global human-environmental crisis threatening humanity's survival and continuance and that human activities have contributed to and continue to contribute to, declining conditions, it follows to clarify what it is that needs to change: from what, to what and why? The following sections will address the nature of changes needed by first contemplating mainstream Western perspectives as a brief background leading to discussion of education as a system for change.

2.3 The 'From': Mainstream Western Perspectives

This section describes an overview of the status quo represented in the literature, along with some key limitations of its characteristics. This section provides a background to what needs to be changed and why it is considered critical by many authors (see such as IPCC, 2007; Simmons 1991, 2008) for the future of humanity that such changes must occur.

It is clear that there are many different philosophical perspectives or worldviews within societies and certainly within the global population (Armstrong & Botzler, 1993). Some of the literature reviewed in this thesis, including Kilbourne et al. (2002) and Kopnina (2011b), argues that the current Dominant Social Paradigm or 'DSP' (the way the majority of a social group predictably think or behave) of the world leans towards Western perspectives. Jacob (1994, p. 477) describes such broad categories of perspectives as 'mainstream perspectives'. Western perspectives tend to

reflect blends of anthropocentric (assuming humanity is to be valued more highly than other things), technocratic (assuming technology fixes everything), Judeo-Christian (humans are God's appointed stewards of the Earth), reductionist scientist (things are examined and considered in fragments and in isolation from the whole), capitalist (profit over-rides other considerations), utilitarian consumerist (resources are there to be used) and individualistic (self-interested) understandings, assumptions and motivations (see Moss, 2010; Murdy, 1975; Porritt, 1991).

Both anthropocentric and technocratic perspectives assume that human moral relationships with nature should be determined solely by human needs (Negra & Manning, 1997). Within such perspectives, humans and human activities are perceived to be separate from nature (Simmons, 1991). Humans are viewed as being superior to other creatures and to nature in general (Kant, 1963). Humans' relationship with nature is considered to be one of stewardship, concerning only those non-human entities that have value to humans (Armstrong & Botzler, 1993; Fraser Darling 1969). Sterling (2005) explains that, from the mainstream Western perspective, all other things, often including the natural world and often, other people, are considered to be resources. Some anthropocentric views argue that the way in which humans treat non-humans is merely a matter of taste (Guthrie, 1967); any human actions towards nature may be justified (Kant, 1963); any consequences of actions that do not bear directly upon humans in the present or the future are considered acceptable (McGee, 1990). In an anthropocentric view, 'real risks' might be seen as those that pose an obvious hazard to human comforts, benefits, health or life (McGee, 1990).

The technocentric or technocratic perspective is a subset of anthropocentrism, differing in that technocrats assume that in all areas of human behaviour and interaction with nature, experts know best (Thompson, 1996). Science and technology play a large role in the technocratic or technocentric perspective, in providing a knowledge base with which any problem might be overcome (Handel, 1982). Human survival and well-being are seen to depend on this expert knowledge, and on management of nature for economic growth and other human ends (Burkhart, 1997). Information is often only acceptable if it is

couched in scientific and/or economic terms (Porritt, 1991; Suzuki et al., 2007; Turner, 2005), which in turn heavily influence, and are influenced by, political ideologies (Aronson, et al., 2010; Gore, 1992; Small & Mallon, 2007). It follows that science, economics and politics strongly influence contemporary framings within mainstream Western perspectives and influence environment-related attitudes, values, decisions and behaviours amongst the public and our leaders (Gore, 1992; Lautensach, 2003; Gluckman, 2010; Mooney, 2010; Simmons, 1991, 2008).

As a classically trained teacher, it is confronting to think of 'science' as part of our framing. While there is no standard description of the scientific method (Armstrong & Botzler, 1993, p.2), science has a primary methodology of reductionism in which we examine the world around us in fragments and often, in isolated pieces that are manageable parts of a whole, without always considering the whole (Simmons, 1991; Suzuki et al., 2007). This approach can allow us to look deeply into something, but means we have to piece isolated bits together, sometimes linking incomplete, disjointed and somewhat disparate information, to understand the overall picture as best we can (Gluckman, 2010; Suzuki et al., 2007). The difficulty arises when the required constructed objectivity of 'being scientific' disconnects us from our ecological and other intuitions, so hinders our capacity to assess from the kind of holistic perspective (Royal, 2007; Suzuki, et al., 2007; Taylor, et al., 2007) that some argue is urgently needed in considering and addressing the global environmental situation (Gore, 1992; Simmons, 1991, 2008). In this way, the reductionist framing of science operates as the superior approach within mainstream Western perspectives, something that is highly problematic for attempts to rethink EE/EfS.

Chapman (2004a), Foley (2010) and Gilding (2012) are amongst a body of authors who describe an emphasis within mainstream society upon continuous, ever-increasing consumption for the purposes of production, development, growth and, overall, profit. Gore (1992) argues that such attitudes, values and behaviours with associated acceptable levels of risk and collateral damage or 'externalities', including destruction and contamination of finite resources, is simply not sustainable on a finite planet (also see such as

Aronson et al., 2010; Foley, 2010; Gilding, 2012; Simmons, 1991). Aronson et al. (2010, p. 225) caution that unfettered and accelerated consumption will 'hit the wall' of scarcity of finite biological resources and exhausted systems and services, and ultimately lead to societal collapse, human decline and possibly human extinction.

Some authors (see such as Mol & Spaargaren, 2000; Pollini, 2009) articulate an optimistic hope of escalating human-environmental crisis stimulating a last minute technological solution. To carry on despite knowing the status quo clinging to such hope ignores all the lessons demonstrated in the evidence of collapses of cultures through ignorance and/or arrogance and/or choice illustrated in our collective histories (see such as Allen, 1970; Aldrich, 2006, 2008; Diamond, 2003; Gilding, 2012). Such a path where we continue to ignore our inextricable biological selves and our ecological interdependence would be, in all probability, a short one for billions of humans. Arguments within the literature suggest that, in order to be avoided, comprehensive changes in attitudes, values and behaviours that are not technocentric are needed (see such as Porritt, 1991; Sterling, 2001).

The following section describes the nature of such changes as are needed.

2.4 Shifts Needed – Holistic or Ecocentric Attitudes, Values and Behaviours

Fien (2001), Foreman (1991), Lautensach (2003) and others, argue that human survival depends upon humanity's capacity to see that we are part of nature and the environment around us and not a separate entity. These authors and still many others (see for example, Agyeman, 2002; Aronson et al., 2010; Cajete, 1999; Campbell, 2001; Chapman, 2004a; Coyle, 2005; Durie, 2010; Fien, 2001; Hardin, 1977; Lautensach, 2003; Mehrota, 2006; Roszak, 1992; Royal, 2010; Simmons, 2008; Suzuki et al., 2007) stress that humanity's understanding of our inextricable inter-relatedness, inter-connectedness with and interdependence upon other life and systems on the Earth is critical to sustainability, at the very least. These understandings reflect perspectives of holism or ecocentrism (Armstrong & Botzler, 1993).

Ecocentric and Holistic perspectives assume that human moral relationships should be determined by the intrinsic rights and comfort of both humans and non-humans (Leopold, 1949). Human and non-human life forms are believed to have value in themselves (Gunn, 1986; Leopold, 1949; Rodman, 1983). In these world-views, humans are considered to be part of nature (Gunn, 1986) and have no right to use any resource beyond satisfying vital needs; that is, those needs that are essential to all life (Foreman, 1991; Rodman, 1983). It is commonly understood, particularly amongst many indigenous world-views, that humans are inter-related, inter-connected with and inter-dependent upon all that is (Cajete, 1999; Royal, 2010).

Aldrich (2008) and others (see, for example Allen, 1974; Simmons, 2008) posit that failure to understand and ultimately, live by such basic holistic principles, will likely lead to human failure and eventually, human extinction. Upon such rationales, it is argued by Marietta (1988), Marlor (2010), Tilbury (2004) and a host of other scholars therefore, that urgent comprehensive shifts in values and changes in awareness, understanding, attitude and individual action within the global community are needed towards holistic or more ecocentric positions that may facilitate the realisation of ecologically sustainable communities and society (Aldrich, 2006, 2008; Angell et al., 1990; Aronson et al., 2010; Blewitt, 2004; Campbell et al., 2001; Coyle, 2005; Cullingford, 2004; Lautensach, 2003; Sterling, 2001, 2004). The need for change to be towards holistic or more ecocentric attitudes, values, ethics and behaviours is a third starting point of this research.

The sections of this chapter to this point have identified the global challenge facing humanity of signs of a collapse of ecological systems upon which we depend for survival and continuance, at least in part due to human activities, and emphasised an urgent need for change from anthropocentric-technocentric to holistic or more ecocentric attitudes, values and behaviours. This leads us to considering how to go about facilitating such necessary comprehensive changes. The following section will describe education as a key mechanism for hoping to achieve a shift to an ecologically sustainable paradigm.

2.5 Education: Key to Change

Since the 1960s and early 1970s, 'education' has been widely and consistently highlighted throughout the literature as being considered key to achieving necessary changes in societal attitudes, values and behaviours towards a sustainable future (Cullingford, 2004; Sterling, 2001; Gluckman 2010; UNEP, 1972; UNESCO-UNEP, 1976, 1978; UNESCO 1978, 1993, 1997, 1998, 2002, 2005, 2008, 2009, 2011; Williams, 2008). Specifically, environmental education (EE) and education for sustainability (EfS) and their variants[3] have been developed and implemented both in response to the global human-environmental crisis and to the need for the changes sought (Williams, 2008). That education and in particular EE and EfS, is key to a shift of attitudes, values and behaviours that may actualise an ecologically sustainable society is a fourth starting point for this research.

Sterling (in Blewitt, 2004, p. 51) notes that while the idea of remedying environmental ignorance through education is influential, the notion cannot be simply and uncritically accepted. As Blewitt (2004, p. 39) reminds us, it is important to remember that 'education' in itself, even at high levels, is not the solution to the human predicament given that, in the past, highly educated people have caused great damage to the Earth. Allen (1970), Cachelin et al. (2010) and Nisbet et al. (2011), are amongst authors who caution that it is not the existence of education itself that counts; rather, it is a combination of the purpose, nature and content of education and the frameworks and cultural meanings from which and upon which, learning occurs (Kilbourne & Polonsky, 2005; Royal, 2007; Sterling, 2001). It is stressed that what is most important is that learning actually DOES occur so that a necessary shift in paradigm may be realised (Chapman, 2004, 2006; Lautensach, 2003; Sterling, 2001). That meaningful collective learning needs to occur and manifest as a paradigm shift, regardless of what its effective vehicle is called, is a fifth starting point of this research.

[3] There has been ongoing debate and dispute in conception, articulation and practice of both EE and EfS. These will be described later in this chapter.

2.6 Environmental Education

Ways in which people have tried to help individuals, groups or communities develop awareness, knowledge, attitudes and skills to understand and care for the environment, and often to resolve environmental issues, have commonly been referred to as 'environmental education' (see, for example, Brennan, 1974; Disinger, 1989; Eames et al., 2008; Hungerford et al., 1980; Tilbury, 1995).

Recognition of the impacts of human activity on the Earth grew through the 1960's and led to a series of international meetings sponsored by the United Nations during the 1970's, for the purpose of identifying issues and solutions (Gough, 2006). Environmental education and education for sustainability have evolved out of these meetings (Gough, 2006; Williams, 2008). Palmer et al. (1998), Sterling (2004) and others have described the history and evolution of EE and EfS and their variants.

There are many descriptions and definitions of environmental education (M.o.E., 1999b). Each description stems from different sets of attitudes, values and philosophical perspectives of reality, issues, possibility, values and perceptions of 'need' that comprise different worldviews (Handel, 1982; McKay, 1998). The implications of this will be discussed later in this chapter. However, there is general agreement that among the most commonly accepted goals, objectives and guiding principles for environmental education are those recommended and endorsed at the 1977 UNESCO-UNEP intergovernmental Conference on Environmental Education in Tbilisi (USSR) (UNESCO-UNEP, 1978, p. 3) and subsequently re-endorsed at the 1987 UNESCO-UNEP International Congress on Environmental Education and Training in Moscow (UNESCO-UNEP, 1988):

> *(1) The goals of environmental education are:*
>
> *(a) to foster clear awareness of, and concern about, economic, social, political and ecological interdependence in urban and rural areas;*

(b) *to provide every person with opportunities to acquire the knowledge, values, attitudes, commitment and skills needed to protect and improve the environment;*

(c) *to create new patterns of behaviour of individuals, groups and society as a whole towards the environment.*

(2) *The categories of environmental education objectives:*

Awareness: *to help social groups and individuals acquire an awareness of and sensitivity to the total environment and its allied problems.*

Knowledge: *to help social groups and individuals gain a variety of experience in, and acquire a basic understanding of, the environment and its associate problems.*

Attitudes: *to help social groups and individuals acquire a set of values and feelings of concern for the environment, and the motivation for actively participating in environmental improvement and protection.*

Skills: *to help social groups and individuals acquire the skills for identifying and solving environmental problems.*

(UNESCO, 1978; cited in Gough, 1990, p. 41)

The goals and objectives endorsed in the Tbilisi Declaration (UNESCO-UNEP, 1978) draw from the principles and guidelines established at an international workshop on environmental education held in Belgrade, Yugoslavia, during 1975, which became known as *the Belgrade Charter* (UNESCO-UNEP, 1976).

The ideology expressed in the Belgrade Charter (UNESCO-UNEP, 1976) and Tbilisi Declaration (UNESCO-UNEP, 1978) place EE as an essential component of education critical in stimulating and shaping change in human attitudes, values and behaviour. EE was originally articulated in the Belgrade Charter (UNESCO-UNEP, 1976) as a holistic approach and described in the Tbilisi Declaration (UNESCO-UNEP, 1978) as a comprehensive, fundamental, integrated framework linking all aspects of education and urged that:

> *Environmental education must look outward to the community. It should involve the individual in an active problem-solving process within the context*

> *of specific realities, and should encourage initiative, a sense of responsibility and commitment to build a better tomorrow. By its very nature, environmental education can make a powerful contribution to the renovation of the educational process.*
>
> (UNESCO-UNEP, 1978, p. 24)

Unfortunately, in the thirty-seven years since Belgrade (UNESCO-UNEP, 1976), there has been little or no change in global attitudes, values, ethics or behaviours (Coyle, 2005). That there has been no meaningful change is a sixth starting point of this research.

The reasons for there being no change are complex (Cullingford, 2004). Identifying, considering and understanding some of the factors and tensions that contribute to the lack of change will inform this study and its outcomes. The next section will start to explore some of the key causes and tensions in order for their consideration and perhaps unravelling towards suggestions for possible correction through this thesis.

2.7 Fifty Years On – Why No Change?

It is now fifty years since Rachel Carson's (1963) *Silent Spring* stimulated a groundswell of public concern at the state of the environment and human interactions with nature (Stevenson, 1987) and a growing official response, including recognition and appreciation of the need and urgency for necessary shifts towards holistic societal attitudes, values and behaviours (UNESCO-UNEP, 1978, p. 12). Despite considerable activity (see, for example, UNCED, 1992a, 1992b, 1992c; UNESCO 1972, 1978, 1993, 1996, 1998, 2000, 2002, 2005, 2008, 2009, 2011 and so on), it is evident in the literature that very little change of consequence has been achieved beyond rhetoric (Aronson et al., 2010; Coyle, 2005; Simmons, 2008; Williams, 2008; UNEP, 2012; UNESCO, 2011).

Authors such as Sauvé (1999) and Sterling (2001) are adamant that before fundamental shifts in attitude, values and behaviours may be achieved towards necessary holistic positions, the framework itself must be changed to something clear and engaging. Sterling (2001) argues that EE and EfS need to be nothing less than *transformative* and is clear that the way we think about

this itself needs to shift before meaningful change towards a shift in paradigm may occur (Sterling, 2005). Ecocentric-holistic awareness, knowledge, understandings, connections, attitudes and values, skills and behaviours are unlikely to come from mainstream Western thinking and most likely to arise from holistic-ecocentric attitudes, values, ethics and models. This is the seventh starting point for this research.

Cullingford (2004) and Campbell (2001) have observed that agreeing to and achieving proactive, holistic change as called for in the literature and recommended policies such as those of *the Treaty on Environmental Education for Sustainable Societies and Global Responsibility* (TEESSGR) (Earth Council, 1992) is easier stated than actioned. While there are examples of excellent EE and EfS programmes and results in the literature (see such as Fien, 2001, p. 129), these appear to be isolated and exceptional instances. Bolstad et al. (2004) and a swath of authors describe regional, national and international EE and EfS initiatives in similar terms to Brignall-Theyer et al.'s (2009), "ad-hoc and individual-champion-driven" (see also; Chapman et al., 2006; Eames et al., 2008; Gough, 2005; Henderson & Tilbury, 2004; Lautensach, 2003; Williams, 2008). A major hurdle to date has been that:

a) few if any contemporary Western perspectives allow the holistic understandings recognised as necessary or a priority in the literature (Gough, 1987; Kiefer & Kemple, 1999; Fien, 2001; Miller & Hopkins, 2013), and;

b) most efforts towards change described in the literature have been conceptualised and implemented from within mainstream Western perspectives, upon mainstream assumptions and frameworks, engaging mainstream epistemologies and pedagogies (see such as Sterling, 2001, 2005)

General implications of the two over-arching limitations are reflected in the documentation of studies investigating states and shifts in awareness, attitudes and behaviours. For example, Coyle's (2005) study of shifts in environmental awareness, literacy and competence amongst the American

public over a period of ten years, for example, indicates public awareness of environmental issues has increased, yet few people accurately understand the significance or relevance of the information, and even fewer displayed ability, readiness or willingness to change, let alone competence in having made changes. In other words, there have been no meaningful shifts in values or detectable changes in awareness, attitudes or behaviours.

As another example of the main limitations symptoms, a study conducted by the International Social Survey Programme (ISSP) between 1993 and 2010 (Smith, 2013) has shown environmental issues are not perceived to be a priority amongst its international participants. The ISSP study's results (Smith, 2013) indicate that environmental issues (most of which have implications and potential effects for their or following generations' or collective futures) have been eclipsed by concerns relating to the states of economy, health care, education, poverty and crime, all of which have immediate effects upon the individual as against indefinite possible future effects and outcomes.

In light of such evidence as described above, it is informative to the purpose of this research to identify and understand reasons why environmental issues are not seen as a priority. It is also informative to identify and understand reasons why there has been little or no meaningful change achieved towards holistic societal attitudes, values and behaviours; and how these failings relate to education in terms of what is or is not being done, so that gaps may be closed and a course for a sustainable society actualised. The following section will explore some considerations identified in the literature that inform this research in this regard.

2.8 Mainstream Education, EE & EfS Sustains Unsustainability

2.8.1 EE: Misinterpreted, Misunderstood & Marginalised

Rather than becoming the fundamental basis for integrated education envisaged in the Tbilisi Declaration, EE has in many instances either been reduced to a topic in its own right or more commonly, as an aspect of science (Robottom, 2012). Many authors, including Fien (2001), Gough (2006) and Tilbury (1996) have described EE and EfS being constrained in terms and

practice to address the natural environment and 'nature study' (including gardening), waste management (particularly recycling) and outdoor education (often confused with outdoor pursuits). Such specialisation and compartmentalisation is a feature of reductionist approaches and technocentric worldviews, and work contrary to the need for a paradigm shift to holistic understandings, attitudes, values and behaviours. It appears such objectives have either not been understood or not been palatable within modernist neoliberal mainstream thinking: prioritising development, progress and capital gain or 'growth'.

Differences in conception and ethic led to disparity in form, content, approach, practice and description in theorising and implementing EE (Sauvé, 1999). Considerable confusion and debate resulted (and continues) in the literature as to what is or is not EE (see such as Disinger, 1983, 1990; Sauvé, 1999), distracting critical attention, energies and resources from the central mission of facilitating a shift in paradigm. Environmental education was being misinterpreted and misunderstood in various ways upon various agendas, and so marginalised in policy and practice (see Huckle, 1991, 1996; Knapp, 1998; Tilbury, 1995). Such observations substantiated and reiterated Van Matre's (1984) conclusions of environmental education being a "mission gone astray".

2.8.2 'Sustainable Development': Education for Sustainability

In 1980, an international meeting coordinated by the IUCN and supported by UNEP, WWF, the United Nations Food and Agriculture Organisation (FAO) and UNESCO, prepared a World Conservation Strategy, establishing the World Conservation Union (IUCN, 1980). The goal of the World Conservation Strategy is the integration of conservation and development to ensure that modifications to the planet secure the survival and well-being of all people (IUCN, 1980, p. 19). The concept of 'sustainable development' emerged from this meeting as a strategy for human survival and prosperity (IUCN, 1980, pp. 18-19).

In 1987 'sustainable development' was recommended as a means of ensuring the well-being of current generations without compromising that of future

generations in the Brundtland report (WCED, 1987). The Brundtland report was prepared by World Commission on Environment and Development (WCED). It described the results of the first comprehensive survey of the state of the Earth's environment, and was presented to the UN in 1987 by the WCED Chair, former Prime Minister of Norway, Dr. Gro Harlem Brundtland. The report recommended education focusing ". . . on the environment and . . . integrated into other disciplines in the official curriculum at all levels in order to develop a feeling of responsibility toward the environment is identified as one way of achieving this" (Brundtland Commission, 1987, p. 136).

Vaillancourt (1992) suggests that 'sustainable development' has been engaged as a deliberately vague term, and as a political compromise between commercial and environmentalist pressures. Disinger (1990) and others have been critical of the oxymoronic nature of the idea of 'sustainable development' as a misguided economic theory which overlooks parameters of a finite and ecologically functioning world.

Such concerns as Disinger's (1990) and Vaillancourt's (1992) not-withstanding, 'sustainable development' has become the "goal for humanity" (UNESCO, 1998) and the contemporary focus and ethical basis of education relating to the environment and in general, shaping perceptions, attitudes, values and behaviours within society (UNESCO, 1997), first as 'education for sustainable development', then as education 'for sustainability'. As with EE, confusion, debate and redefinition around the framework of what is or is not EfS have been constant, despite agreement of core underpinning objectives articulated in Belgrade (UNESCO-UNEP, 1976) and then Tbilisi (UNESCO, 1978). Many variants have been and continue to be argued over.

Throughout the literature a very clear pattern of swings and shifts between an official United Nations and governmental advocacy and push for EE and EfS to be a vehicle for accelerated, indefinitely sustainable economic development and growth (UNESCO, 2002) and non-governmental organisations, academics and practitioners 'playing watchdog' and perpetually attempting to steer EE and EfS policy back towards Belgrade (UNESCO-UNEP, 1976) and Tbilisi (UNESCO, 1978) objectives. A clear example is a set of alternative treaties

developed by NGOs, who gathered in Rio de Janeiro between June 1 and 15, 1992 for a global forum (the Conference of Citizens Groups), that ran parallel to the United Nations Conference on Environment and Development: 'the Earth Summit' (UNCED, 1992). *The Treaty on Environmental Education for Sustainable Societies and Global Responsibility* (TEESSGR) outlines a view of education which is considerably different from that set out in Chapter 36 of the UNCED (1992) *Agenda 21.* Principle 15 of TEESSGR (Earth Council, 1992) suggests that environmental education should empower all peoples and promote opportunities for grassroots democratic change and participation, so that communities regain control of their own destiny. Unlike the terms of *Agenda 21*, TEESSGR (NGOs, 1992) does not assume that development is desirable for indigenous people. Rather it asserts in Principle 14 that:

> *Environmental education must recover, recognise, respect, reflect and utilise indigenous history and local cultures, as well as promote cultural, linguistic and ecological diversity. This implies acknowledging the historical perspective of native peoples as a way to change ethnocentric approaches, as well as the encouragement of bilingual education.*

The flavour and tone of the *Treaty on Environmental Education for Sustainable Societies and Global Responsibility* (Earth Council, 1992) is proactive rather than following the problem-based, reactive mould of official UN documents, and advocates collaboration, communication and cooperation at all levels, yet maintenance of independence for communities and nations. It is notable, however, that the terms of both 'camps' throughout the literature to date reflect reductive mainstream tendencies towards seeking and arguing precise definitions, interpretation, formulation, redefinitions and resultant acronyms that have served to perpetuate debate. For example, the TEESSGR (Earth Council, 1992) introduces yet another variant of environmental education as 'environmental education for equitable sustainability' (EEES) to the debate.

The 50-year dispute over interpretation and formulation of the mainstream EE/EfS framework has distracted from both the need and the mission (Gough, 2002). Coyle (2005) and Dunlap (2013) are amongst a number of authors who argue that such has served to compound public perception of

disagreement amongst the scientific community regarding central issues supporting the need for change, including climate change, peak oil and human population. Further, misunderstandings, manipulations and misapplications of terms and objectives in contemporary political applications by the UN, by international governments acting with UN endorsement, and by corporates and interests (including the popular media) referred to as 'the denial machine' (Piltz, 2008) undercut efforts of academic, NGOs and of informed practitioners seeking to achieve meaningful societal shifts in attitudes, values and behaviours towards ensuring humanity's survival and continuance (see such as Boykoff, 2013; Dunlap, 2013; Piltz, 2008). The multiplicity and broad range of perceptions, understandings and practices of what comprises (or does not comprise) EE towards what objectives or purpose, has been problematic (Sauvé, 1999).

Many educators have been and continue to be confused as to the need and nature of either EE or EfS (Coyle, 2005). While authors such as Greenall Gough & Robottom (1993) point to some outstanding examples of achievement of effective EE/EfS evident within the community, the literature suggests such are fragmented, isolated, and largely unsupported (Brignall-Theyer et al., 2009; Chapman, 2004c), so appear to have occurred despite mainstream educational frameworks (Coyle, 2005, Eames et al., 2008).

Disinger (1990) and others have expressed concern that such debate serves to distract the informed and desensitise, disillusion and disengage the wider population from the real issues and need for buy-in and action (see Aronson et al., 2010; Gore, 1992 & 2006; Suzuki et al., 2007; Van Matre, 1984). Bolstad (2003) on the other hand, suggests that the process of 'environmental education' being supplanted by terms such as 'education for sustainable development' (ESD), 'education for a sustainable future' (ESF), or 'learning for a sustainable future' (LSF) reflects a broadening concern beyond conservation issues to integration of social, political and economic sustainability (Tilbury, 1995).

Studies by the likes of Coyle (2005) and Smith (2013) illustrate that, while awareness of environmental issues appears to have increased amongst the

public, shifts in attitudes, values and behaviours have not significantly changed. Simply raising awareness of human-environmental issues is recognised in the literature as being insufficient to bring about change (Ministry or Education, 1999b, p. 8).

Bolstad (2003, p. 69) notes that contemporary literature often describes EE/EfS as comprising three dimensions: education 'in' the environment', education 'about' the environment, and education 'for' the environment. Further, the literature commonly maintains that 'true' EE/EfS occurs when the purpose is 'for' the environment (see such as Fien & Greenall Gough, 1996). Coyle (2005) reports that EE and EfS are commonly informational, 'about' the environment or environmental issues (as environmental science), and often 'in' the environment (as nature study and/or outdoor education), but rarely 'for' the environment (addressing social, economic, cultural interactions) in any meaningful capacity.

Authors including Coyle (2005) and Fien (2001) suggest there can be large gaps between what is described in EE and EfS programmes and what is actually done, leading to further confusion and ineffectiveness.

Several scholars (see such as Aldrich, 2008; Chapman, 2006; Eisner, 2003; Gough, 1987) observe that most mainstream Western education, including EE and EfS, is founded upon and shaped by mainstream Western perspectives. These authors and others (see such as Scholz, 2011; Simmons; 1991, 2008; Sterling, 2001) express concern that such educational initiatives operate upon assumptions, epistemologies and pedagogies that arise from mainstream Western worldviews and frameworks towards mainstream Western goals - those that have contributed to, if not led to, the current escalating human-environmental crisis – and as such, reinforce and perpetuate the status quo. In other words, to a greater or lesser extent, it can be argued that mainstream Western education, EE, EfS and their variants, sustain unsustainability. That mainstream education, EE and EfS and their variants sustain unsustainability establishes an eighth start point for this research.

2.9 Different Thinking, Different Framework

The observation that no meaningful change has occurred and that most mainstream educational pedagogies and practices are based on and effectively perpetuate the status quo indicate that, despite widespread agreement of the need and contrary to the need, collective learning has indeed NOT occurred (Cullingford, 2004; Diamond, 2003). This perhaps also explains the lack of learning and lack of change described in the literature: the main hurdles to change, as suggested in the previous section.

For example, David Orr (1992, p. 1) suggests that ". . . more of the same kind of education that enabled us to industrialize (sic) the earth (sic) can only make things worse . . ." echoing Einstein's (1879-1955) observation that ". . . we can't solve problems by using the same kind of thinking we used when we created them". Sterling (2001, p. 11) argues that, at best, ". . . 'education for sustainable development' or environmental education' within the framework of a mechanistic education paradigm can only meet with limited success, as such forms of education for change are marginalized (sic) and accommodated by the mainstream".

Sterling (2001) and Campbell et al. (2001) have stressed the necessity to break the cycle of maintaining what we know within the mainstream Western worldview, and to identify, effectively implement and commit to an epistemology for deeper education and practices that will allow transformation to the vision of a truly environmentally literate (Coyle, 2005, p. xiii) and competent society, equipped to realise an ecologically sustainable future. As Cajete (1999), Fien (2001) and Stables & Scott (2002) have reasoned, regardless of best intentions, efforts that are not based upon and model ecocentric-holistic attitudes, values, behaviours, are unlikely to imbue ecocentric-holistic awareness, knowledge, understandings, connections, attitudes and values, skills and behaviours.

In order to address such challenges contemporary education needs to be fundamentally reappraised and adjusted (Aldrich, 2008) so that basic changes in our guiding cultural assumptions may facilitate radical, but very necessary, educational reform (Bowers, 1999, p. 163). Rather than learning being ". . .

functional or informational . . ." and ". . . oriented towards socialization (sic) and vocational goals that take no account of the challenge of sustainability" (Sterling, 2001, p. 79), the underlying purpose of education needs to reflect the likes of Coyle's (2005, p. xiii) vision, described above in the preceding paragraph, including Sterling's (2001, p. 79) objective of and provision for, critical, creative and participatory learning (Wilson-Hill, 2003).

Blewitt & Cullingford (2004), Gough (1987, p. 50), Lautensach (2003), Power (2001, pp. 27-28), Simmons (1991) and Sterling (2001, pp. 78-79) all say education needs to be re-oriented towards an ecological-holistic, 'whole systems' paradigm. Sterling (2001, p. 61) refers to this as a "change from *transmissive* to *transformative* learning. . . ". Learning needs to be understood as a lifelong process (Blewitt, 2004, p. 38). Content and activities of education need to be relevant, meaningful and interesting to the learner (Robinson, 2013), and practical in terms of Delors[4]: learning **to do**, learning **to know**, learning **to be**, and learning **to live together**, with the adaptability and resilience to survive and continue (Blewitt, 2004, p. 38, his emphasis).

Considerable focus of EE/EfS research has been turned towards developing a legitimate epistemological and pedagogical basis for the development of EE/EfS that builds on growing understandings of transferability of knowledge and skills (Birdsall, 2005, 2011), whole school approaches to learning (Eames et al., 2009c; Eames & Barker, 2011), participation (Wilson-Hill, 2003), and individual action competence (Jensen & Schnack, 1997). Eames et al. (2009a & 2009b) have developed and Aotearoa-New Zealand framework for whole school approaches to action competence. Bolstad (2003, p. 70) describes the objective of such contemporary initiatives as being for students to become competent and willing participants in current and future actions that contribute to the solution or avoidance of environmental problems. Unfortunately, the problem-based, reactive technocentric language and assumptions represented in such frameworks as Eames et al.'s (2009a & 2009b) and descriptions such as Bolstad (2003) illustrate the key gap identified

[4] UNESCO, International Commission on Education for the 21st Century, 1996, as described on page 25 of Blewitt, 2004

in section 2.8 of this chapter of change being sought towards holistic outcomes within mainstream Western frameworks.

Authors such as Sauvé (1999) and Sterling (2001, 2005) are adamant that before fundamental shifts in attitude, values and behaviours may be achieved towards necessary holistic positions, the framework itself must be changed to something holistically aligned, clear and engaging. That our guiding cultural assumptions and frameworks need to shift before a change in paradigm may occur is the ninth starting point of this research.

John Fien (2001, p. 124) suggests that ". . . problems of unsustainability should not be regarded as ones requiring technical solutions, but rather as symptoms, or consequences, of the wider malaise of many of the modern values and practices that have supplanted indigenous systems of sustainability and have put the world on its present unsustainable path". Kawagley and Barnhardt (1999, pp. 117-140) suggest that educational curriculum needs in terms of those appropriate to survival and continuance in ecological balance, are in fact indigenous to the context of place (see also Orr, 1990). Orr (1992) describes this overall idea as ecological literacy (See also Mancl et al., 1999), while others such as Coyle (2005) describe a combination of environmental sensitivity, environmental awareness, environmental literacy, and environmental competence, with each successive ability and degree of ability a prerequisite for the next. Many authors (such as Aldrich, 2008; Stables et al., 2002; Suzuki et al., 2007 and so on) not only support this view, but go further to suggest that what is needed for humanity as a whole to learn, move forward, survive, and continue, may in all probability, lie within existing indigenous cultural understandings, attitudes, values, ethics and practices (Royal, 2010).

The next section of this chapter will consider an overview of what is described in the literature of indigenous and otherwise holistic worldviews that might inform the purpose of this research.

2.10 Lessons from our Past to Shape the Future: Drawing on Indigenous Roots

History shows us many instances of cultures, societies and communities who have risen to ascendancy and then disappeared (Bellamy & Quayle, 1986; Diamond, 2003; Fagan, 2008; Simmons, 1991). In most cases, there has been some sort of sudden or progressive environmental change that has made that civilisation's lifestyle no longer sustainable (Diamond, 2003; Fagan, 2008). Inability or unwillingness to recognise the need or to make necessary adjustments in the window of opportunity, should such have existed, inevitably led to such societies' demise (Bellamy & Quayle, 1986; Fagan, 2008; Melko, 1995; Scholz, 2011). The lessons here appear simple and clear (Diamond, 2003).

There are also many examples throughout history of peoples and cultures that have survived change over time and space by managing to adapt sufficiently to and cope with change (Turner, 2005). Such people, our ancestors, were observers of themselves and of nature and the world around them (Williams, personal comment, 2012). They understood that, no matter how advanced their thinking or their technologies, humans are a part of nature, not apart from nature (Hanbury-Tenison, 1991); that, in one way or another, all comes from the Earth – is the Earth – and so is inextricably inter-related so that, eventually, all returns to the Earth (Cajete, 1999; Leopold, 1949). Observations of the folly of non-recognition, insensitivity to, if not defiance of, such basic (for indigenous peoples) understandings of human's interconnection and the importance of balance, by indigenous peoples of conquesting cultures, are similarly recorded (Hanbury-Tenison, 1991; Suzuki et al., 2007). So too are observations of significant change and clear predictions of serious ecological changes based on thousands of years of cultural observation of cause and effect, many of which have long since come to pass (McFadden, 1989). Again the lessons of the past, from which contemporary humanity might choose to learn, appear elementary.

While traditional cultures have dwindled and in many parts of the world have become, to a greater or lesser degree, lost or blurred as their practices are supplanted with or tainted with, mainstream Western societal and

technological influences (Simmons, 2008), much wisdom arising from lessons of the past endure in traditional understandings and practices (Turner, 2005). Johnson (1992) notes that the value of traditional knowledge of indigenous peoples, and particularly their traditional environmental knowledge (Heckler, 2009, pp. 2-5), has been increasingly recognised in the literature.

A key observation in the literature is of disconnectedness from nature, and corresponding environmental illiteracy, within Western society (Campbell, 2001; Coyle, 2005), including much of Aotearoa-New Zealand (Bolstad et al., 2004). Suzuki et al. (2007, p. 34), for example, suggests that as we have become increasingly reliant upon technology in centralised, built and controlled environments of the developing world, we have lost our connection to the rest of the living planet and feel ourselves separate to nature:

> *We forget the source of our water and energy, the destination of our garbage and our sewage. We forget that as biological beings we are as dependent on clean air and water, uncontaminated soil and biodiversity as any other . . . Divorced from the sources of our own existence, from the skills of survival and from the realities of those who still live in rural areas, we have become dulled, impervious, slow.*

At this fundamental level, authors including Aldrich (2008), Diamond (2003), Gluckman (2010) and Simmons (2008) suggest the contemporary human position, as a consequence of the mainstream Western ethos is, to a greater of lesser extent, vulnerable.

A body of authors, including Cajete, (1999), Hanbury-Tenison (1991), Fien (2001) and Royal (2002, 2010), describe indigenous cultural perspectives throughout the world as requiring a basic and intimate understanding of humanity as just one inter-connected and inter-related part of the environment in which a specific people survive and depend upon for survival. Leaders in raising awareness amongst the global community of the current ecological crisis strongly suggest that indigenous understandings are possibly ". . . far more profound than current science, because it has been tested over time with the survival of those who possessed the knowledge . . ."

(Suzuki, 2007). In cases such as those of Australian Aboriginal peoples, these qualities have been demonstrated over many thousands of years (Australian Geographic, 2011). UNESCO (2002, p. 3), for example, observes that:

> For thousands of years human societies have proved that living sustainably – as healthy and happy individuals, within caring and stable families and communities, and in harmony with the natural world – is possible. (UNESCO, 2002, p. 3)

Further, as Williams (2011, p. 10) has suggested:

> *All peoples, on Earth, have made their environmental errors but it is instructive to focus upon a group who seem to have learned from theirs and modified their society accordingly.*

In the context of Aotearoa-New Zealand, Māori are just such a group. Māori are the indigenous peoples, the tāngata whenua (people of the land) of Aotearoa-New Zealand (Durie, 2010; Ka'ai, 2003; Williams, 2004; Royal, 2007). Baker (1945, p. 229) explains that the origins of the term 'Māori' are not definitive, but the term appears to have been applied as a generic description of a native of Aotearoa-New Zealand since the arrival of Europeans in the country. Māori are thought to have inhabited Aotearoa-new Zealand for 800 to 1000 years before the arrival and settlement of Europeans around 1800 AD (King, 2003).

In the short time that humans have been in Aotearoa-New Zealand, we have dramatically changed the environment (Ministry of Education, 1999b). It is likely to have taken some time for pioneering Māori communities to learn from their environmental mistakes (King, 2003b; Upton, 1997; Williams, 2004) and to develop what may have been a sustainable lifestyle through the customs and practices of kaitiakitaka (Matunga, 1995; Williams, 2004). Despite the development of a holistic, relationship-focused philosophy (overviewed in Chapter 4), the costs of Polynesian settlement of Aotearoa-New Zealand were significant (Anderson, 1968; King, 2003, Ministry for the Environment, 1997), including the destruction of one third of the forest cover and the known

extinction of 36 species of endemic land birds (Ministry for the Environment, 1997).

Cajete (1999), Fien (2001), Hanbury-Tenison (1991), Kawagley & Barnhardt (1999), Royal (2010), Suzuki et al., (2007), and others suggest indigenous cultures may have the qualities that are lacking in mainstream Western society, including traditions of facilitating for transformative (Sterling, 2001, p. 61), lifelong learning (Blewitt, 2004, p. 38). In many enduring cultures the traditional understandings and lessons subsequently learned persist to this day (Cajete, 1999; Royal, 2010; Williams, 2004). Some scholars suggest that, while such cultures are apparently technologically vulnerable (actual or perceived) to the onslaughts of accelerating global environmental change (Adger et al., 2003; Nyong et al., 2007), others (Allen, 1970; Aldrich, 2008) suggest that they may in fact be considerably better equipped to contextualise, adapt and survive, at individual and collective levels (see Smit & Wandel, 2006, p. 282), than members of modern mainstream technological society. In other words, it appears that such cultures may be equipped with qualities of and capacity for, resilience. The key to humanity's survival may more likely be found amongst these pools of knowledge and wisdoms than within any technological 'fix' (Aldrich, 2008; Scholz, 2011).

2.10.1 Resilience, adaptability and 'sustainability'

The term 'resilience' is used in a variety of ways in the literature (Miller & Hopkins, 2013, p. 14). Davidson (2010) and others (e.g. Folke, 2006) describe its original use in the fields of physics and mathematics (Davidson, 2010) to describe the capacity of a material to return to equilibrium after a displacement (Norris et al., 2008). In terms of physics, resilience describes not only the capacity to bend and bounce back but also the speed at which balance is re-established (Gordon, 1978). Resilience was first applied in ecological terms by Holling (1973) to describe adaptive response and recovery of disturbed ecosystems towards ecological balance. The term has since been applied in health and psychology, as well as in the social sciences (Berkes and Ross, 2013, p. 6). Resilience is described in terms of social science as the process that produces adapted outcomes in anticipation of or response to

predictable and/or unpredictable rapid change (see such as Norris et al., 2008, p. 132). Such descriptions tend to reflect some degree of technocentric optimist or accommodationist perspectives of the ability of social systems to bounce back from disruption to a 'normal' state of being, essentially retaining the same function and structure.

Capacity for resilience has increasingly become a topic and focus of research reflected in the literature over the past forty years (Berkes & Ross, 2013, p. 6). Much of recent literature exhibits a technocentric focus upon strategies for disaster readiness (Smit & Wandel, 2006; Norris et al., 2008) and/or upon community development - such as building capacity to cope with challenging social conditions (Berkes & Ross, 2013). Norris et al. (2008, p. 127), for example, describe community or 'collective' resilience as a metaphor emerging from four adaptive capacities: economic development, social capital, information and communication, and community competence, in terms of community potential to be prepared for, function effectively and adapt successfully in the aftermath of disasters or 'shock'. Miller and Hopkins (2013, p. 14) suggest that the concept of resilience has gained popularity because shocks to geopolitical, environmental, energy and economic systems have become more commonplace, and because there is a growing recognition that more shocks are on the way.

Berkes and Ross (2013, p. 6) explain that thinking about resilience – or 'resilience theory' - is one of the major conceptual tools in the environment literature to deal with rapid and flexible responses to rapid change. Resilience theory deals with system dynamics and conceptualises ecosystems as continuously changing, sometimes abruptly and unpredictably. Along with resilience, 'adaptability', 'adaptive capacity' and 'vulnerability' of human systems have become part of a closely associated focus (see such as Smit & Wandel, 2006). 'Adaptability' describes capacity, capability and flexiblity to adapt to change to influence resilience (ibid., p. 15). Vulnerability describes a lack in such adaptive capacity and resilience. 'Wellness' or 'well-being', is described to be the result and measure of successful adaptation (Norris et al., 2008, p. 132).

"In its broadest 'social science' context . . .", Berkes and Ross (2013, p. 7) suggest, " . . . resilience is about ecosystems and people together as integrated social-ecological systems in which social systems and ecological systems are recognized [sic] as coupled, interdependent, and coevolving". A key assumption of resilience theory is that there is no balance in nature, but rather a nonequilibrium or (more accurately) multi-equilibrium conditions within unpredictable systems, which are all subject to cycles of continuous change and renewal (Berkes & Ross, 2013, p. 7; Davidson, 2010; Noberg & Cummings, 2008). While grounded in an underpinning technocentric perspective, such an assumption progresses contemporary mainstream Western perspectives (see section 2.3 of this thesis) to a position of recognising that 'sustainability', in terms of the indefinite perpetuation of a discrete socio-cultural-economic system, does not exist (Davidson, 2010, p. 1137). As Davidson (ibid.) explains, history demonstrates that, although varying in longevity, all systems known to science have come to an end. In such light, resilience theory, by intent or by accident, seriously challenges mainstream Western assumptions apparently underpinning approaches such as the UN goal for 'sustainable development' as a strategy for human survival, well-being and prosperity (e.g. IUCN, 1980, pp. 18-19) (see section 2.8.2 of this thesis).

Magis (2010) describes resilience as an indicator of social sustainability, which suggests a perspective of resilience (community or otherwise) being a component of 'sustainability' (or sustainable development). Miller & Hopkins (2013, pp. 13-16) argue to the contrary, that sustainable attitudes, values and behaviours should be understood to be component qualities and aspects of resilience, along with understanding of vulnerability, flexibility, innovation and capacity for adaptability. I hypothesise in this thesis that both perspectives are accurate: that a critical and inseparable interdependent relationship exists between the two concepts, so that there can be no semblance of sustainability without capacity for resilience while at the same time no resilience without capacity for 'sustainability' in terms of capacity to survive and progressively adapt and continue (see such as Aldrich, 2008). This thesis draws upon Berkes and Ross' (2013) approach to developing an integrated concept of community resilience seated in a synthesis of ecological understandings (see such as Hollings, 1973; Magis, 2010) and complex

adaptive systems (see such as Davidson, 2010; Norris et al. 2008; Smit & Wandel, 2006).

This research's review of the literature supports Berkes and Ross' (2013, p. 17) observation that while there is much theorising in the literature about the characteristics, need for and benefits, there is little describing methodologies for facilitating and achieving community resilience (Berkes & Ross, 2013, p. 17). As alluded to in the opening paragraphs of this section, many authors point to cultural history (e.g. Aldrich, 2008; Simmons, 2008) and indigenous cultures (e.g. Turner, 2005; Suzuki et al., 2007) as sources of such methodology.

2.10.2 Lessons in Resilience, Adaptability, Well-being and Survival

Campbell (2001), Fien (2001), Suzuki et al., (2007) and others, in reflecting upon their interpretations of indigenous cultures resilience and lessons to be learnt, have observed that, in order to move forward and hope to achieve a sustainable future, we need to return to the basics of life and learning: understanding first ourselves and what is needed to simply 'be' and stay alive and well (Oats, 2001; Mehrotra, 2006). We need to understand our biological and ecological selves (Sterling, 2001), our basic needs (Suzuki et al., 2007), interconnections and inter-relationships (Simmons, 2008), in context with our specific and global settings (Porritt, 1991), in order to equip ourselves for resilience and survival (Aldrich, 2008). We need to not only understand the probable future under the current DSP or 'mainstream perspective' and have a realistic vision of possible and preferred futures (Simmons, 1991), but also to look behind us, through history and work out what choices we have collectively made, learn from these, understand how to adjust and change the way we think, behave and interact – otherwise history will, without doubt, repeat (Gore, 2006; Porritt, 1991; Scholz, 2011; Simmons, 1991).

Coyle's (2005) study indicates that a public being aware of alternatives through informational education is not sufficient to imbue change (see also UNESCO-UNEP 1994, 1996; UNESCO, 2011). Simmons (1991) has observed that, regardless of information, in order to actively change it is first necessary

to be willing to change (Diamond, 2003). Diamond (2003), with other authors, such as Aronson et al. (2010) and Suzuki et al. (2007), concludes that ultimately we will either choose to change or the choice will be made for us through changing conditions and circumstance, with which we may cope or not.

It would appear to make sense to gather, understand and utilise all knowledge bases and skills towards addressing the common issue of environmental futures and survival, particularly those that are tried and proven (see such as Brundtland, 1987; Suzuki, 2007), learning from the past to build a better future (UNESCO, 2002), in an ecologically sound blend of the best-of-the-old with the best-of-the-new (Williams, personal comment, 2012) – in other words, drawing upon the collective wisdom of lessons learned from the past in terms of what understandings, ethics and practices maintain ecological balance and so sustainability, and combining these strategically with appropriately compatible ecologically sustainability new technologies.

Understanding of inter-relationship, inter-connection, inter-relatedness and interdependence and transferral of the same, along with levels of environmental literacy and competence, are described by authors such as Royal (2007) and Williams (2004) to continue amongst many Aotearoa-New Zealand Māori, embodied within Māori culture as it is variably understood and reproduced. Williams (2004) and others have described a pervasive conservation ethic amongst Māori, which is based upon, and reinforced by, perceptions of direct relationship and inter-connectedness with all that is, traceable through whakapapa (genealogy) to the beginning of time (Ka'ai, 2003; Royal, 2010; Williams 2004). Such a conservation ethic is lacking in the Western worldview (Cullingford, 2004). Despite an increasingly evident urgent need (Aronson et al., 2010; NAAEE, 2011a), efforts to date at establishing such a conservation ethic throughout the national and global community have been predominantly ineffective, frustrated or are incomplete (Bolstad, 2004; Eames & Chapman, 2008; Coyle, 2005). That such qualities are described in the literature as being evidenced amongst indigenous cultures, and in particular amongst Aotearoa-New Zealand Māori, is a tenth start point for this research.

The theme of 'we need to learn from traditional indigenous cultural and environmental knowledge' is common within the literature (see such as Fien, 2001; Suzuki et al., 2007), as are descriptions of lessons in context with specific peoples and places by authors such as by Johnson (1992) and Turner (2005) of indigenous lore in localised contexts. However, no documented examples of epistemologies for transitional education and learning arising from indigenous cultural perspectives, understandings and practices were identified in this study's search of the literature. In their lead up to (Chapman & Eames, 2007) and revision of New Zealand's guidelines for EE (Ministry of Education, 1999b), for example, Eames & Chapman (2008) have observed that there is a significant lack of robust Māori cultural perspectives being understood or represented in Aotearoa-New Zealand's environmental education policy or practice. I suggest that identifying and understanding why and how a conservation ethic occurs and pervades within Māori culture is a start to responding to gaps in educational understanding and practice affecting human-environment perceptions, attitudes and values, interactions, relationships and well-being.

This chapter has positioned the research with ten starting points that emerge from two critical gaps identified in the literature, giving rise to the direction and purpose of this thesis. The following section summarises the key starting points in this review of the literature that have established the rationale and direction for development of this research and thesis.

2.11 Chapter Summary

This chapter has reviewed the literature describing the escalating global human-environmental crisis and the adequacy of human responses to date, with particular reference to mainstream Western education, environmental education and education for sustainability. This review of literature has established the background and rationale for this research, which is summarised as follows:

1. An escalating global human-environmental crisis threatens systemic collapse and so significantly threatens the security of humanity;

2. human attitudes, values, ethics and interactions need to change comprehensively and urgently;

3. fundamental change from human-centred to holistic attitudes, values and behaviours is critical;

4. education, and in particular EE and EfS, is key to effecting such change;

5. regardless of label, meaningful collective learning needs to occur to produce a holistic paradigm shift;

6. despite this knowledge, after fifty years of educational efforts and rhetoric, there has been no meaningful change;

7. ecocentric-holistic awareness, knowledge, understandings, connections, attitudes and values, skills and behaviours are unlikely to come from mainstream Western thinking and most likely to arise from ecocentric-holistic attitudes, values, ethics and models;

8. mainstream Western education, EE and EfS often arise from mainstream Western attitudes, values and ethics, which have led to and perpetuate the status quo and are not sustainable; therefore sustain unsustainability;

9. basic changes in our guiding cultural assumptions are needed to achieve radical educational and social reform;

10. examples of such ecocentric-holistic attitudes, values, ethics and models exist within understandings, attitudes, values, ethics and practices of indigenous cultures, such as Aotearoa-New Zealand Māori.

It has been theorised that identification and understanding of why and how a conservation ethic occurs and persists within Māori culture may inform adequate response to the critical gaps identified in the literature.

2.12 Chapter Conclusion

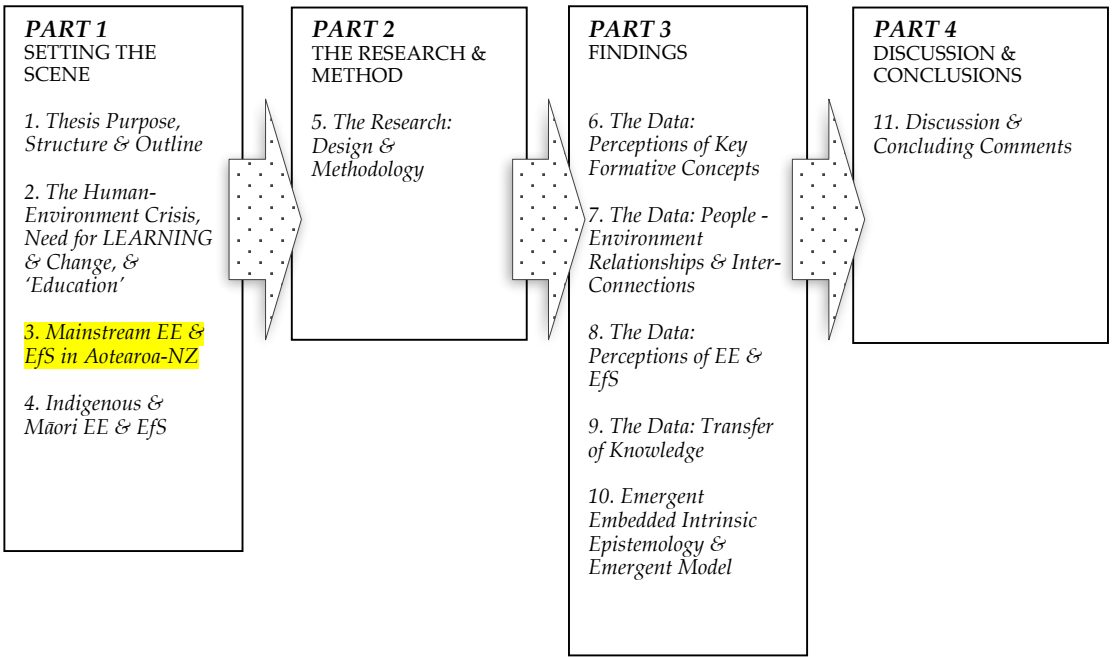
The purpose of this chapter has been to describe the background and context of this research, to explain and substantiate its rationale and purpose. Its sections first introduced the need and context for this research, before describing the nature of and rationale for urgent, comprehensive and fundamental paradigm change. Education, environmental education (EE) and education for sustainability (EfS) were then described as critical vehicles towards such change. Identification of reasons for lack of meaningful change, despite 50 years of efforts, followed with descriptions of what is needed for gaps to be closed and ecologically sustainable lifestyles and futures realised. Consideration of what might be learned from indigeneity and, specifically, Māori culture led to a summary of key points and this chapter conclusion.

The purpose of this research has been refined through this process: to identify ways in which understandings and approaches informed by Māori culture might help address epistemological and pedagogical gaps in mainstream environmental education and education for sustainability.

Given such a purpose, it is appropriate that this research reviews the literature describing EE and/or EfS or their equivalent as documented within Māori culture. First though, in light of contemporary Māori culture sitting within the context and parameters of a bicultural Aotearoa-New Zealand society and its systems, it would be useful to the purposes of this research for the status of mainstream environmental education and education for sustainability in Aotearoa-New Zealand to be understood.

The following chapter will review the literature with a specific focus upon mainstream environmental education and environmental education in Aotearoa-New Zealand, as a background to a subsequent chapter reviewing the literature focused upon EE and/or EfS within Māori culture.

3.0 MAINSTREAM ENVIRONMENTAL EDUCATION AND EDUCATION FOR SUSTAINABILITY IN AOTEAROA-NEW ZEALAND



3.1 Introduction

The previous chapter has described the background and rationale to this research in terms of the context, emergence, nature and status of environmental education (EE) and education for sustainability (EfS) on the international stage as represented in the literature. This chapter will present an overview of the current status and framework of EE and EfS in the context of Aotearoa-New Zealand as represented in the literature.

Aotearoa-New Zealand's *Guidelines for Environmental Education* (Ministry of Education, 1999b) and other governmental documents[5] juxtapose EE and EfS. For this reason, and for the purposes of this research, unless being differentiated for a point of discussion, EE and EFS will henceforth be described in this thesis as being coupled as 'EE/EfS'.

[5] See such as http://seniorsecondary.tki.org.nz/Social-sciences/Education-for-sustainability Retrieved 6 October 2013.

This chapter will first describe how EE/EfS is currently represented, resourced and supported in Aotearoa-New Zealand, before a description of its current frameworks. Next the Enviroschools programme will be reviewed. The Enviroschools programme is an independent initiative that is the main driver of formal EE/EfS in Aotearoa-New Zealand. Descriptions of independent EE/EfS programmes in primary schools follow, before an overview of the status quo of EE/EfS in the secondary School and then tertiary education sectors. An overview of barriers to EE/EfS in Aotearoa-New Zealand will lead to a review of recent EE/EfS research and theory in Aotearoa-New Zealand and its implications, before the chapter's summary and conclusion.

The following section will describe the current status of EE/EfS in Aotearoa-New Zealand.

3.2 Current Status of EE/EfS in Aotearoa-New Zealand

The history and status of environmental education (EE) and education for sustainability (EfS) in Aotearoa-New Zealand has been described by various authors including Bolstad et al. (2004), Brignall-Theyer et al. (2009), Eames & Chapman (2008), Eames & Barker (2011); Eames et al. (2006), Law (2005), McKay (1998) and Williams (2008). Essentially the pattern of development, evolution of terms, prioritisation and status is reflective of the international literature (Eames & Barker, 2011). Much of the contemporary literature in the context of Aotearoa-New Zealand is constrained to seeking to address the same set of concerns around lack of support from the system, funding, time, resources, prioritisation and training (e.g. Brignall-Theyer et al., 2009; Eames et al., 2006; Williams, 2008), all of which are perhaps indicative of a general lack of comprehension or acceptance amongst community leaders and decision-makers of the human predicament described in the previous chapter[6].

[6] See for example Key, J. (2011). In Harper, P. (2011), K*ey Rejects BBC Criticism of NZ 'Pure' Claim*. N.Z. Herald, Wednesday May 11, 2011. http://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=10724868

EE/EfS has received no formal governmental funding or support in Aotearoa-New Zealand since December 2009[7] following a change to a more right-wing government in November 2008 (Eames & Barker, 2011). Prior to the 2008 change of government, Chapman & Eames (2007) have described governmental ambivalence towards the environment and ecological sustainability issues and suggest EE/EfS's marginal (and inadequate) status in schools reflects this (see also Brignall-Theyer et al., 2009; Bolstad et al. 2008). Further evidence of governmental ambivalence has been noted by Bolstad et al. (2008) and others in a lack of meaningful official recognition and advocacy of the UN Decade of Education for Sustainable Development (DESD) (UNESCO, 2002, 2005). Eames & Barker (2011, p. 187) observe that the 2008 change in government appears to have compounded the EE/EfS's low prioritisation and marginal status. They also note a concurrent related tension between exploitation and conservation demonstrating " . . . the critical need for environmental education in [Aotearoa-New Zealand] to equip our people with the education to be kaitiaki (guardians) of this land and to make good decisions for its future" (Eames & Barker, 2011, p. 189).

EE/EfS is not compulsory in the schooling of Aotearoa-New Zealand's young (Bolstad et al., 2008; Chapman & Eames, 2007; Eames & Barker, 2011; M.o.E., 1999b; Williams, 2008), nor is it included as a core part of teacher training (Bolstad et al., 2008). Inclusion of EE/EfS in education programmes is voluntary (Chapman & Eames, 2007) and at individual teacher and school discretion.

Economic imperatives, assessment and standardisation have become the priority for education in schools (Eames & Barker, 2011). There is significant pressure on schools and teachers to ensure students achieve National Standards[8] for literacy and numeracy in primary schools and pass topic-based examinations in secondary schools (Brignall-Theyer et al., 2009; Eames & Barker, 2011). EE/EfS is required to fit around governmental, community and school priorities dictated by National Standards for reading, writing,

[7] See Ministry of Education Budget 2009
http://www.minedu.govt.nz/theMinistry/Budget/Budget2009/EducationSavings.aspx
[8] http://www.minedu.govt.nz/theMinistry/EducationInitiatives/NationalStandards.aspx Retrieved 6 October 2013.

mathematics and other contemporary 'core' subjects in early childhood, primary and secondary school programmes (Bolstad et al., 2008; Eames & Barker, 2011; M.o.E., 1999b). It follows that environmental education has struggled for recognition, acceptance, inclusion and support, let alone prioritisation sought in *the Belgrade Charter* (UNESCO-UNEP, 1976) and *Tbilisi Declaration* (UNESCO-UNEP, 1978), in Aotearoa-New Zealand schools and communities. Eames & Barker (2011, p. 187) suggest that lack of cohesion through governmental support threatens to stall the progress that has seen EE/EfS being delivered in over 25% of all Aotearoa-New Zealand schools (see also Eames et al., 2010).

From the literature (e.g. Brignall-Theyer et al., 2009) it is clear that EE/EfS initiatives are co-ordinated and implemented with the initiative, enthusiasm, funding and support of volunteers, some teachers and some schools, some local and regional government agencies, a few government agencies, some institutions (mainly at departmental levels) and non-governmental organisations (NGOs), including the World Wildlife Fund and the Tindall Foundation[9]. In other words, EE/EfS in its various guises happens largely despite the constraints of the system. Independent initiatives, such as the Enviroschools programme (Enviroschools Foundation, 2010a) have developed, expanded and gained momentum. The Enviroschools initiative has had significant influence upon EE/EfS in Aotearoa-New Zealand (Eames & Barker, 2011; Jackson, 2009) and will be described in more detail later in this chapter. Despite the support of the Enviroschools programme (Enviroschools, 2013) and other non-governmental initiatives, lack of prioritisation, cohesive direction, support and coordination within a clear and engaging framework mean that EE/EfS efforts continue to be fragmented, 'piece-meal' (Bolstad et al., 2008) and 'ad hoc' (Brignall-Theyer, 2009), and so vary hugely in nature, relevance and outcomes (Eames & Chapman, 2008).

Such an unflattering description of the status of EE/EfS in Aotearoa-New Zealand contrasts with the urgent need and objectives for EE/EfS described in the literature yet is consistent with many of the gaps described in the global overview of the previous chapter. As has been described already, the

[9] See http://www.wwf.org.nz/what_we_do/community_funding/funding_for_schools/

development of EE/EfS in Aotearoa-New Zealand has followed a similar pattern to many Western countries to a point where, despite the need being apparent and widely recognised in the literature as being critical (e.g. Aronson et al., 2010; Lautensach, 2003; Sterling, 2005 and so on), incomplete and inadequate frameworks for EE/EfS appear to be in place to, at best, give a semblance of activity, yet ensure marginalisation and so perpetuation of the status quo. The following section will describe the framework for EE/EfS in Aotearoa-New Zealand as it currently stands.

3.3 The Aotearoa-New Zealand Framework for EE/EfS

Aotearoa-New Zealand's Ministry for the Environment (1998) has prepared a National Strategy for Environmental Education entitled *Learning to Care for Our Environment*, which followed the 1995 release of the Environment 2010 Strategy (M.f.E., 1995a). The National Strategy for Environmental Education was developed without clear objectives, policy and a mandate for its implementation (McKay, 1998) and so was directionless without a policy, definition and official commitment. Subsequent associated poor allocation of resources appears to have contributed to poor credibility and acceptance of EE/EfS in educational realms (Brignall-Theyer et al., 2009). More than a gap in legislation, lack of EE/EfS policy may be a negative influence upon people's awareness, attitudes and priorities of sustainability as a foundation of education (ibid.).

The Ministry of Education (Ministry of Education, 1999b) produced *Guidelines for Environmental Education in New Zealand Schools* in 1999. A guide for education for sustainability in secondary schools has been developed for senior students from these guidelines as part of the Ministry of Education's secondary school curriculum guides[10].

Aotearoa-New Zealand's Ministry of Education (1999b) *Guidelines for Environmental Education* describe an environmental concept of 'interdependence', highlighting relationships between all living things with "their physical environment" and relates this to Fien and Gough's (1996)

[10] See http://seniorsecondary.tki.org.nz/Social-sciences/Education-for-sustainability

systemic description of looking at the environment as a set of inter-related systems – the biophysical, social, economic and political systems:

> The biophysical system provides life-support systems for all life. A social system provides rules and structures that enable people to live together. An economic system provides ways of producing and exchanging goods and services. Through a political system, people make decisions about how social and economic systems use the biophysical environment.

M.o.E. (1999b) guidelines also suggest, amongst other things, that the concept of interdependence is reflected in "the Māori world view" and that "Environmental Education provides a context for learning about these interdependent relationships and people's effect on them". Māori cultural concepts are acknowledged and it is suggested that as well as Western perspectives of concepts such as "interdependence, sustainability, biodiversity, and personal and social responsibility for action", Māori cultural concepts such as " . . . whenua, mauri, rangatiratanga, taonga, hauora, rāhui, tapu, and kaitiakitanga can be developed through . . ." integration in topics arising from mainstream Western perspectives, epistemologies, pedagogies and frameworks, such as science.

Eames et al. (2008) have described the Ministry of Education's 2002 establishment of National Education for Sustainability (NEFS) team as (Williams, 2012): a team of candidates to train as school advisers for environmental education to help develop teachers' and other environmental educators' capacities to facilitate environmental education or education for sustainability. Funding was extended in 2006 to secure NEFS operations for three years, to establish a Māori language initiative, *Te Mātauranga Taiao*, and to provide contractual support for the established, proven and expanding Enviroschools programme (Eames et al., 2010). This programme and all others, was discontinued in December 2009 (Eames & Barker, 2011).

The New Zealand Education Curriculum was reviewed in 2007. In terms articulated by Sterling (2001) in *Sustainable Education: Re-visioning Learning and*

Change, the nature of the review is potentially transformative. Eames & Barker (2011) and others (e.g. Bolstad et al. 2006; Eames & Chapman, 2008; Eames et al., 2008; Eames et al. 2011) have observed this potential for EE/EfS and its outcomes. The Curriculum (M.o.E., 2007) not only provides for inclusion of EE/EfS in schools, it also encourages schools and communities to design their own curriculum in the context of local community and individual needs.

Connection to the land and environment is stated as a key part of the vision for lifelong learners as confident, connected, actively involved community members that is articulated in the Curriculum (M.o.E., 2007, p. 8). Eight meaningful principles direct the focus of each school's curriculum design to support and empower learners in *learning how to learn* in a locally *engaging and meaningful* context and *coherent* manner, to have *high expectations* of being *included* and experiencing *cultural diversity*, including understanding Aotearoa's founding *Tiriti o Waitangi* (the Treaty of Waitangi), with a proactive *focus upon the future* (M.o.E., 2007, p. 9). The Curriculum (M.o.E., 2007) encourages the modelling and exploration of eight core values, including ecological sustainability and care for the environment, with integrity, respect, equity and community participation, amongst others. These values are consistent with holistic philosophical objectives articulated in the *Belgrade Charter* (UNESCO-UNEP, 1976) and Tbilisi Declaration (UNESCO-UNEP, 1978).

While the National Curriculum (M.o.E., 2007) has stopped short of making EE/EfS mandatory (Eames and Barker, 2011) in schools, its transitional scope leaves few reasons why schools cannot work with local communities to create curricula and pedagogy based on the principles of EE/EfS towards developing an environmentally competent and 'sustainable' society. I suggest that perhaps one of the few reasons why such potential has not widely been grasped may lie in the terms of the National Curriculum (M.o.E., 2007) being commonly interpreted from within contemporary frameworks upon mainstream Western philosophical perspectives and assumptions, rather than from holistic perspectives. The potential for such a shift by administrators and educators in interpretation and application, to consider and understand the

National Curriculum (M.o.E., 2007) from a holistic and literal perspective, in itself appears significant to the intentions of this research.

Bolstad et al. (2008) have observed a widespread lack of appreciation or understanding amongst Boards of Trustees, school administrators, and teachers of the nature, need for and purpose of EE/EfS. Brignall-Theyer et al. (2009) suggest that without clear objectives, policy and a clear mandate for policy makers and educators to understand, prioritise and deliver effective and meaningful EE/EfS (McKay, 1998), as well as without appropriate educator training, support and funding, the National Strategy for Environmental Education (M.f.E., 1998) and *Guidelines for Environmental Education in New Zealand Schools* (1999b) are insufficient and inadequate as a framework (see also Bolstad et al., 2008; Eames & Barker, 2011).

In their positioning paper Chapman & Eames (2007) observe both the potential for the new curriculum (M.o.E., 2007) and disparities between it and the *Guidelines for Environmental Education* (M.o.E., 1999b). They also observe the Ministry of Education's cognisance of the fact and arrangements for revision being implemented. Eames & Barker (2011, p. 187) confirm that as a consequence of the change of government and resultant focus described in the previous section, a revision of the guidelines has not occurred. The low cognisance of a need for EE/EfS and subsequent ambivalence of the current government is reflected in the total lack of funding and support, and relegation of EE/EfS to the volunteer and NGO sector of the economy, and to the discretion of schools and teachers. Despite lack of government leadership, funding and support, many schools and agencies have developed and maintained EE/EfS programmes either as part of a NGO network or locally and independently.

The main independent network synonymous with EE/EfS in Aotearoa-New Zealand and key driver of formal EE/EfS in Aotearoa-New Zealand, has been the Enviroschools programme. The following section will overview the Enviroschools programme's origins and development, illustrating the programmes influence and importance in EE/EfS in contemporary Aotearoa-New Zealand.

3.4 The Enviroschools Programme

In the early 1990's, the Hamilton City Council developed a trial programme with three schools in and around Hamilton as 'Enviroschools' (Jackson, 2009; Williams, 2012). The success of environmental education in these schools and their communities led to the development of a programme for facilitated Enviroschools, launched in 2001, with a kit of resources for interested schools and a professional development programme for teachers and facilitators in the Hamilton area (Enviroschools, 2010a). The Enviroschools kit became available throughout Aotearoa-New Zealand in 2002 through the collaboration of the New Zealand Association for Environmental Education with local and central government agencies (Williams, 2012). The Enviroschools Foundation was established in 2003 as the governing body for Enviroschools, with a national office in Hamilton over-seeing Enviroschools throughout the country, coordinated on a regional basis (Enviroschools, 2008; Jackson, 2009). The influence of the EnviroSchools programme has been significant throughout Aotearoa-New Zealand since the Foundation's establishment in 2003, with around 28% of schools and kura and 58% of Local Authorities involved in the Enviroschools network in November 2010 (Enviroschools, 2010a).

A team of Māori educators, Te Mauri Tau, helped develop the Enviroschools programme to include Māori perspectives and values (Enviroschools, 2010a). The Enviroschools programme is guided by five main principles that, to a greater or lesser degree, incorporate or are reminiscent of Māori values, perspectives and approaches:

- Empowered students
- Learning for sustainability
- Māori perspectives
- Respect for diversity of people and cultures
- Sustainable communities

(Enviroschools Foundation, 2008, p. 9)

A need for indigenous people's inclusion in education for sustainability has been emphasised in the literature, including *Agenda 21* (UNCED, 1992) and other United Nations' documents (see such as UNESCO-UNEP, 1976; UNESCO-UNEP, 1978; UNESCO, 2002; UNESCO, 2007; UNESCO, 2009, and others). Eames and Chapman (2008) note a lack of meaningful integration in the context of Aotearoa-New Zealand EE/EfS policy and practice (see also Bolstad et al. 2004). In such light, the involvement of Te Mauri Tau and inclusion of aspects of Māori culture in the establishment of the Enviroschools programme and its kaupapa, is significant.

Bolstad (2003), Eames & Barker (2011) and Wilson-Hill (2003) describe 'the Enviroschools approach' as being to encourage the development of a whole school curriculum that actively involves all staff, students, management, administration and operations, and includes the physical and biological environment, along with the local community (see also Williams, 2012; Jackson, 2009). The Enviroschools Foundation (2004) seeks to model sustainable attitudes, values and practices in healthy learning environments, including and incorporating the natural and built environment, in projects within the local and wider community. Enviroschools offers training for facilitators, as well as support for schools and communities, including resource kits and a network of agencies, NGOs and schools (Enviroschools Foundation, 2010a). This not-withstanding, Jackson (2009) and others note that there is a wide range of interpretations and applications of Enviroschools throughout Aotearoa-New Zealand.

Some studies of educational outcomes of Enviroschools have been conducted, yet there is considerable scope and need for comprehensive evaluation towards their optimisation (Eames et al., 2006). What data has been gathered describing educational outcomes of Enviroschools , despite the limitations of sample size and geographic representation, is positive. For example, Eames et al. (2006) have documented a wide range of other positive educational outcomes. Technological aptitude and innovation are developed in inquiry-based projects that address real-life challenges in energy saving and production, food production, resource recycling and a myriad of others

through meaningful learner participation (Williams, 2012). Bolstad et al. (2008), Eames et al. (2006) and Eames et al. (2010) reported observation of increased awareness and improved knowledge of environmental and social sustainability issues, increased self-awareness and sense of place as well as of physical, social and historical context have been observed, along with improvements in core skills in critical evaluation, planning, decision-making and project design and implementation, amongst students and teaching staff in and associated communities of, Enviroschools.

Eames et al. (2006) also noted increases in a propensity for attitudes of peer leadership, along with improvements in qualities of collaboration, communication and cooperation within the school environment amongst children and their peers and staff, and amongst the wider community. Research indicates similarly clear positive relationships arising from Enviroschool (Wilson-Hill, 2010) and Waldorf (Burnett, 2007) educational philosophies and approaches with text-literacy, numeracy and problem-solving. Such observations, along with those of reduced incidents of bullying or vandalism, complement and reinforce research relating to the Waldorf system of Rudolph Steiner schools (Dahlin, 2010; Rivers & Soutter, 1996), which are based on similar whole school, learner-inclusive, constructivist, experiential action learning educational philosophies and approaches (Delay, 1996; Phillips, 2000).

While not wishing to rely too much on my own recollections, it is useful to note that not <u>all</u> schools have been exemplars of unambiguous positive and deep uptake of the Enviroschools kaupapa[11]. Regardless of the nature and depth of programme content or meaningful learning, schools appear to be considered, marketed as and included in the statistics as 'Enviroschools'. Jackson's (2009, p. 7) assessment of outcomes of Enviroschools goes some way to illustrating this point in concluding:

> In addition to fundamental goals and activities for teaching and learning the Enviroschools concept is valuable for teaching and

[11] Researcher observations during relief teaching in and visits to Primary level Enviroschools in Dunedin, Otago, Aotearoa-NZ 2007-2013.

> harbouring indigenous perspectives regarding land, health and well-being . . .[yet] . . . the reasons for this is there are a number of members within the community who have a deep and rich understanding of these values . . .

This illustrates that despite contributing some degree of cohesion and guidance, rather than a 'silver bullet', 'the Enviroschools approach' in application appears to also be part of the fragmented, 'piece-meal' (Bolstad et al., 2008), 'ad hoc' (Brignall-Theyer, 2009) and hugely variable (Chapman & Eames, 2007) picture of EE/EfS in contemporary Aotearoa-New Zealand. As with any other programme of EE/EfS, the variability of the nature, composition, values, vision and input (Brignall-Theyer et al., 2009) making up different communities " . . . . is one of the major driving factors for the success of . . . Enviroschool[s]" (Jackson, 2009, p. 7).

3.5 Independent EE and EfS in Primary Schools

While there are some very good independent environmental education and/or sustainability programmes being run in Primary schools in Aotearoa-New Zealand, the nature of these tends to be ad hoc and fragmented, with programmes being dependent upon teachers and parents with a particular passion, interest and drive in this area (Bolstad et al., 2004; Eames et al., 2008). Environmental education in Aotearoa-New Zealand is commonly marginalised and is often perceived as an unnecessary extra by Principals and teachers (e.g. Eames & Barker, 2011). Eames & Barker (2011) and many authors clearly articulate that this situation is not aided by a total lack of Ministry of Education support and direction in any regard to matters relating to environmental stewardship, nor by a strong push towards economic development as part of a global community (M.o.E., 2009) and related commercialisation of schools (Brignall-Theyer et al., 2009; Chapman, 2007; Eames et al. 2008). While this is perhaps not so marked in the primary sector, it appears to be the predominant situation in secondary and tertiary institutions in Aotearoa-New Zealand (Bolstad et al., 2004; Brignall-Theyer et al., 2009; Williams, 2012).

3.6 EE/EfS in Secondary Education

It is apparent from the likes of Brignall-Theyer et al. (2009) and Williams (2012) that EE/EfS is struggling for recognition, let alone inclusion, within the secondary school system. Brignall-Theyer et al. (2009) report that efforts seeking to educate towards sustainability within secondary schools tend to be driven by enthusiastic champions in an ad hoc fashion, and in the face of considerable barriers, described elsewhere in the literature over considerable time (e.g. Bolstad et al., 2004; Chapman et al., 2006; Eames et al., 2008; Lautensach, 2003; McKay 1998). Brignall-Theyer et al. (2009) suggest that such lack of change in barriers implies that there is an underlying unwillingness to change organisational structures and public policy.

Brignall-Theyer et al. (2009) and Williams (2012) observe that six level two and five level three New Zealand Level of Educational Achievement (NCEA) standards in education for sustainability have been developed for senior secondary students, complete with supporting teaching and learning modules. However, both Brignall-Theyer et al. (2009) and Williams (2012) note that at the time of their research, relatively few EE/EfS programmes actually existed in secondary schools in Aotearoa-New Zealand. There are a few examples of attempts to integrate some aspects of sustainability into existing senior programmes in a small number of secondary schools, as well as slowly increasing numbers of cross-curriculum projects being implemented in junior programmes (Williams, 2012).

3.7 EE/EfS in Aotearoa-New Zealand's Tertiary Education

Williams' doctoral research (2008) investigated reasons behind a general lack and slow response to the need for change, particularly within higher education in Aotearoa-New Zealand, through examining leadership of education institutions. Her findings suggested a lack of strong support amongst the leadership of most Aotearoa-New Zealand Universities and Polytechnics, reflected in lack of substantive references to sustainability in institutional vision statements and strategies, and thought to be reminiscent of government perspectives (Williams, 2008, p. 248).

Few course options or course content pertaining to environmental or sustainability issues, is evident in Aotearoa-New Zealand University calendars. The University of Waikato offers papers in 'education for environmental sustainability'[12] , and 'environmental and sustainability education'[13] for in-service and pre-service teachers (which are at students' interest and discretion – not a compulsory component of any professional training), as well as 65 courses with an education for sustainability intent (Spicer et al., 2011). Spicer et al. (2011, pp. 6-8) have described an overview of sustainability curricula at Aotearoa-New Zealand tertiary institutions. In their report, Spicer et al. (2011) note that Canterbury University offered more than 150 undergraduate courses that are relevant to sustainability and, while Auckland University similarly offers 160 undergraduate courses, Massey and Victoria Universities total of 'sustainability relevant' courses are unknown and pending investigation. According to Spicer et al.'s (2011) research, Otago University offered 3 major and one minor degree options during 2011, while Victoria University had two majors and a specialisation option in their Building Science degree.

Spicer et al.'s (2011) distinction and categorisation of courses as having 'relevance to sustainability' is interesting in that some argue that sustainability is relevant to all aspects of education (Sterling, 2001), therefore all courses should be included and the exercise of asserting relevance to sustainability is academic and as a measure, effectively meaningless. It is arguable that, for the main part, Aotearoa-New Zealand University students' opportunities for learning reflect perspectives and practices of the dominant social paradigm, which perpetuate the status quo of expansive economic development and, inevitably, escalate sustainability issues for future generations (ibid.; Sterling, 2001).

As an admirable exception, a precedent has been established at the Otago Polytechnic with principles of sustainability underpinning all of its courses, with the objective of engendering sustainable attitudes and practices amongst

[12] University of Waikato, Retrieved 8 May 2012 from http://papers.waikato.ac.nz/subjects/PCSS/TEPC120
[13] University of Waikato, Retrieved 8 May 2012 from http://papers.waikato.ac.nz/subjects/STER/STER513

all its graduates (Spicer et al., 2011). It is apparent that a similar initiative may be underway at Waikato University (ibid.).

Williams (2012) suggests that the overall situation in the formal realms of education in Aotearoa-New Zealand does not reflect well upon the collective institutions of higher education, whose purported role is to act as critic and social conscience for society, and advisors to central government.

3.8 Barriers to EE/EfS in Aotearoa-New Zealand

A number of barriers appear to restrict the acceptance and inclusion of EE/EfS in schools in Aotearoa-New Zealand as already described, but also including lack of environmental literacy amongst teachers, school administrators and Boards of Trustees (Bolstad et al., 2004), lack of opportunities for appropriate professional development and so lack of expertise amongst teachers (Brignall-Theyer et al., 2009; Williams, 2012), and so lack of perception of priority and support amongst school management teams (Coyle, 2005). It appears that this may be largely due to a majority of teachers, Principals and communities lacking understanding of what environmental education and education for sustainability is, why it is important, what it involves, compounded by their own environmental illiteracy and being confused at changes in descriptions and terms, as well as the lack of central government prioritisation, directive, training, funding and support (Bolstad et al., 2004, 2008; Brignall-Theyer et al., 2009; Eames et al., 2006; Williams, 2012).

Bolstad et al. (2004) suggest another limitation is a simple resistance amongst teachers to a change from familiar teaching pedagogy. Brignall-Theyer et al. (2009) reinforce Bolstad et al.'s (2004) observation that such appears to indicate some degree of environmental illiteracy amongst teachers, and particularly among secondary teachers, of the pressing issue of achieving a sustainable society and the urgent need for changes in individual and collective attitudes, awareness and behaviours to achieve such.

The main body of Aotearoa-New Zealand literature points to an over-riding barrier to sustainability education's meaningful inclusion in formal education

in Aotearoa-New Zealand is a resounding lack of governmental support (e.g. Bolstad et al., 2004a, Bolstad et al., 2004b, Bolstad et al., 2008; Brignall-Theyer et al., 2009; Chapman, 2011; Chapman et al., 2006; Eames et al., 2006; Eames et al., 2008; Williams, 2012). Since the election of the National-led Coalition Government in 2008, all funding and support linked to EE/EfS has been withdrawn (Williams, 2012) despite international recognition of the need and urgency for such programmes. For example, United Nations' appeals for governmental prioritisation of pre-service and in-service training of teachers in environmental education have been insistent since the 1970s (UNEP, 1972a, 1972b; UNESCO, 1972; UNESCO, 1978; UNESCO-UNEP, 1978) and 1980s (UNEP, 1987; UNESCO-UNEP, 1988). Likewise, United Nations' appeals for training of teachers in education for sustainable development have been constant leading up to and since the Earth Summit of 1992 (UNCED, 1992a, 1992b; UN, 1992; UN, 1994a, 1994b; UNESCO-UNEP, 1994; UN, 1995; UN, 1997; UNESCO, 1993; UNESCO-UNEP-IEEP-MIO/ECSDE, 1995; UNESCO, 1996; UNESCO-UNEP, 1996; UNESCO, 1997; UNESCO-EPD, 1997a, 1997b; UNESCO, 1998; UNESCO, 2000; UNESCO 2002; UNESCO, 2005; UN FAO, 2005; UNESCO, 2007; UNESCO, 2009). Despite this, there is no component of environmental education or education for sustainability in pre-service or in-service teacher training in Aotearoa-New Zealand (Bolstad et al., 2008; Brignall-Theyer et al., 2009) other than that offered by a few institutions for individual interest and pursuit (Spicer et al., 2011). All Ministry of Education funding to support any teaching and learning for sustainability initiatives in schools was frozen or pulled at the end of 2009 (Williams, 2012). These same barriers to sustainability education have been reflected within the literature for some time, and their continuance suggests a pervading political unwillingness to change structures in educational institutions and public policy in 'Clean-Green' Aotearoa-New Zealand (Brignall-Theyer et al., 2009).

3.9 Recent EE/EfS Research and Theory in Aotearoa-New Zealand

Brignall-Theyer et al. (2009) have noted an increase in levels of research addressing understanding and effective facilitation of EE/EfS in the context of Aotearoa-New Zealand. This trend appears to have continued (e.g. Eames et al., 2009; Eames & Barker, 2011; Robinson, 2013; Wilson-Hill, 2010; Williams, 2012). Recent research has been focused upon identifying progress and status

of EE/EfS in schools and identifying ways of overcoming the physical, structural, perceptual and systemic barriers to effective EE/EfS facilitation (see such as Bolstad, 2003; Coyle, 2005; Eames & Barker, 2011; Robinson, 2013; Smith, 2013) and so achieve meaningful change (Eames et al., 2009; Lautensach, 2003; Stables & Scott, 2002; Sterling, 2001). Of particular interest to this research has been Eames et al.'s (2009) recent development of frameworks for developing action competence (Jensen & Schnack, 1997) and whole-school approaches (e.g. Mardon & Ritchie, 2002; Tilbury & Wortman, 2005; Wilson-Hill, 2003) to EE/EfS in the context of education and learning in Aotearoa-New Zealand. Eames et al. (2009) frameworks are reflected in Enviroschools kaupapa (Enviroschools, 2011).

Whole school approaches are advocated in recent EE/EfS literature (e.g. Bolstad, 2003; Brignall-Theyer et al., 2009, Tilbury & Wortman, 2005; Wilson-Hill, 2010) as an effective way to achieve learning for a sustainable future (Bolstad, 2003). Whole school approaches are quite simply that: the entire school is geared towards and involved in planning and instigating a process of change towards achieving a sustainable school community so that children learn through the culture of the school pedagogy, social climate and organisation, structure and layout (Eames & Barker, 2011; Bolstad, 2003; Tilbury & Wortman, 2005). The Enviroschools programme is an example of a whole-schools approach (Brignall-Theyer et al. 2009). The Enviroschools programme seeks to integrate environmental education into the whole school life and to create learning opportunities by working towards a healthy, peaceful, and sustainable environment, and is characterised by respect for the diversity of Aotearoa-New Zealand's peoples and cultures, and the inclusion of Māori cultural perspectives and practices in relation to the environment (Bolstad, 2003).

Eames and Barker (2011, p. 188) describe action competence (Jensen & Schnack, 1997) as being based on the principles of democratic participation and connectedness, and identify democracy as a European trait and connectedness as an underpinning value of Māori culture. Eames et al. (2009) have developed two frameworks for developing whole school approaches to EE/EFS and developing action competence in the context of education and

learning for sustainability in Aotearoa-New Zealand, which are intended to align with the National Curriculum (Ministry of Education , 2007). The following paragraphs will describe these.

Eames et al. (2009) explain that their whole-school framework is intended to show what whole-school approaches to EfS might look like and to help develop these approaches in schools as a formative tool. The framework identifies and presents twenty-five aspects of an idealised whole-school which schools seeking to develop and maintain a whole-school approach might need to take into account. These aspects align with four general categories or dimensions and have been grouped accordingly in sections in the framework. This categorisation allows each aspect of the school to be considered in a manner similar to that of planning for risk using a risk matrix, so that a clear and comprehensive picture of what is well developed or developing, what is underway or emerging, and what is absent and needing to be facilitated, is apparent and usefully informative for self-adjustment. These categories or dimensions[14] are:

a) People
b) Place
c) Programmes
d) Practices

Each category or dimension of Eames et al.'s (2009) framework for action competence has between three and ten aspects important for developing a whole-school approach to EfS. Table 1 provides an example of one dimension of the framework.

[14] These four categories or dimensions are a central component of the Enviroschools kaupapa (Enviroschools, 2013).

People	WS1	Working collaboratively across all groups involved in the school
	WS2	Reflecting the cultural diversity of the school and its community
	WS3	Acknowledging New Zealand's bicultural foundations
	WS4	Having community relationships for learning
	WS5	Engaging in participatory key decision making
	WS6	Being involved in action for sustainability
	WS7	Having support from school leaders for EfS in school
	WS8	Involving staff in professional development in EfS
	WS9	Recognising the school as part of a local, national and global community in EfS
	WS10	Celebrating whole school achievements in EfS

Table 1: The people dimension and its 10 aspects of Eames et al. (2009) 4 dimension and 25 aspect framework for whole-school approaches to education for sustainability (EfS)

Source: Eames et al., 2009, p. 3

Each aspect has five relative indicators. So, for example, an aspect for consideration under the category of 'people' might be the capacity to work collaboratively across all groups in the school (WS1). The section of the framework allowing a school to gauge the relative status of its capacity to work collaboratively across all groups in the school at a particular time against relative indicators is illustrated in Table 2 below:

People					
Aspect	**Absent**	**Preparatory**	**Emerging**	**Developing**	**Well Developed**
Working collaboratively across all groups in the school **WS 1**	No collaborative working relationships between all groups involved in the school	Awareness of the importance of collaborative working relationships	Collaborative working relationships exist between some groups involved in the school	Collaborative working relationships exist between most groups involved in the school	Collaborative working relationships exist between all groups working in the school

Table 2: Example of one aspect of Eames et al. (2009) twenty-five aspect framework for whole-school approaches to education for sustainability (EfS)

Source: Eames et al., 2009, p. 3

Table 2 illustrates one of twenty-five aspects and sets of indicators. The twenty-four other aspects and indicators would follow underneath, grouped relative to consideration of 'people', 'place', pedagogy', or 'practice', for the school community to assess, map, develop a strategy to address each aspect, communicate, implement and monitor whole-school change over time towards the agreed objectives.

The following paragraphs will now briefly explain Eames et al.'s (2009) framework for developing action competence in education for sustainability. There are six aspects of Eames et al.'s (2009) action competence framework. These are:

a) experience;
b) reflection;
c) knowledge;
d) vision for a sustainable future;
e) action taking for sustainability;
f) connectedness.

Each aspect has been presented by Eames et al. (2009) in their framework with a descriptor, as illustrated in Table 3 below:

Code	*Aspect*
AC1	**Experience** – Experience refers to state, condition (feelings) or an event that has happened. The interpretation of this experience may be personal and/or collective
AC2	**Reflection** - Reflection is the ability to enquire into your own experiences through the process of critical thinking
AC3	**Knowledge** – Knowledge relates to both conceptual and practical understanding of sustainability and the processes through which knowledge is gained and used
AC4	**Vision for a sustainable future** – Future visions for sustainability consider how we might like things to look and also about what changes might need to be made now for the future
AC5	**Action-taking for sustainability** – Action is the intentional act of doing something. It is carefully considered behaviour that promotes sustainability
AC6	**Connectedness** – The inter-connectedness between people and all aspects of the environment: this includes making connections between thinking, feeling and acting (head, hearts, hands)

Table 3** : **The six aspects of Eames et al.'s (2009) framework for action competence in education for sustainability (EfS)

Source: Eames et al., 2009, p. 4

Each aspect is explained in terms of learner and teacher roles, with suggestions for development of these roles, links with the National Curriculum (Ministry of Education, 2007), and evidencing competence, as illustrated in Table 4 below:

Aspect			
Experience	**Learner** A **learner** has experiences of the world which they interpret through the following:	**Teacher** A **teacher** supports students to experience and interpret the world in order to develop personal understanding in authentic settings through the following:	**Possible evidence of this** Evidence could take the following forms
Explanation To be action competent, a learner should have a range of experiences to develop their understanding, commitment and engagement with sustainability issues. This includes learning *in* the environment and *about* the environment to connect the learner to the environment that the issue is situated in and engage their motivation and passion as in the motto 'head, hearts and hands' or 'think, feel, act'. This component develops the 'heart/feel' aspect	**(Suggestions)** - visiting and knowing about local places and habitats and show emotion related to a particular place and/or situation - initiating and planning experiences for themselves and /or others - knowing local places of significance and their relationship to them (such as whakapapa, connections to livelihood)	**(Suggestions)** - planning and implementing experiences that are active and reflective in and beyond the classroom - using experiential learning processes - using cooperative learning processes - encouraging emotional responses and connections to environments and places	**(Suggestions)** - photographs of students engaged in learning beyond the classroom - photographs of students engaged in experiential learning - students talking about learning in the environment plans that indicate learning is based on experiences not just pre-provided information

Table 4: Example of one aspect of Eames et al. (2009) 6 aspect framework for developing action competence in EfS.

Source: Eames et al., 2009, p. 3

Eames et al. have also developed a model (see Figure 2, below) illustrating the development of action competence (middle ring) in relation to international conceptions of EfS (inner ring) and Aotearoa-New Zealand National Curriculum (Ministry of Education, 2007) key competencies.

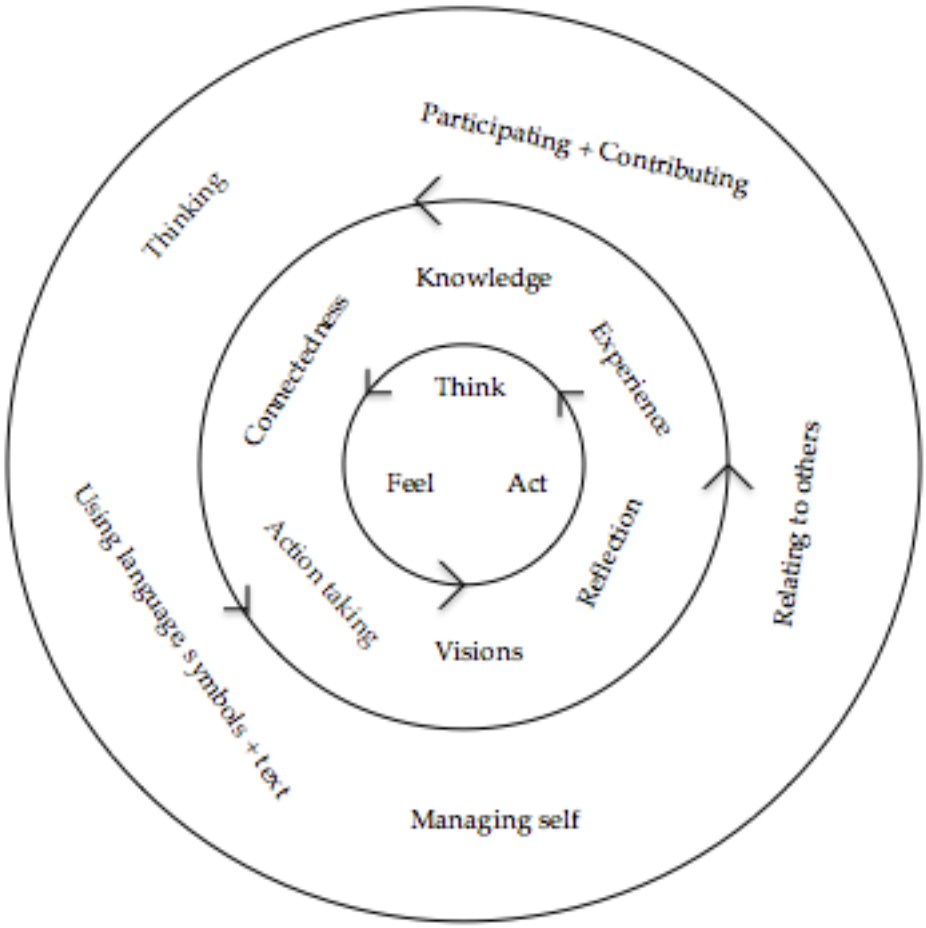


Figure 2: Diagram attempting to show that the development of action competence (middle ring) is linked to international conceptions of EfS (inner ring) and the key competencies of the Aotearoa-New Zealand National Curriculum (M.o.E., 2007) (outer ring)

Source: Eames et al., 2009, *p.2*

In the context of the previous chapter's review of the wider literature (see Sections 2.3, 2.7 and 2.8 of this thesis), there continues in this chapter the spectre of an overarching, inherent gap to some degree in the models reviewed, including aspects of the Enviroschools programme (Enviroschools, 2013) and both of Eames et al.'s (2009) frameworks. This overarching gap lies in each model, framework or programme being to some degree framed upon Western reductionist perspectives[15] and assumptions (see Section 2.3 of this thesis), such as inference that humans are separate from the environment –

[15] In this thesis I am using the term 'Western reductionist perspectives' specifically in the way Suzuki et al. (2007) describe Western reductionism, as a feature of general heavy societal emphasis upon science focusing upon one small part of a subject of interest, isolating that part, then further breaking it down into increasingly smaller parts in isolation (nature, society, the economy, a disease etc…) to try to understand or address the whole, which can lead to loss of context of the whole.

EE/EfS as 'nature study' (e.g. Fien, 2001; Gough, 2006; Tilbury, 1996) or EE/EfS as an 'aspect of science' (Robottom, 2012), and EfS being about fixing environmental problems (e.g. Handel, 1982; Burkhart, 1997). These gaps are described with their implications in Chapter 2 of this thesis, but are also illustrated throughout Eames et al.'s (2009) use of language in the framework in Table 3 above, an example of which is:

> " . . . This includes learning *in* the environment and *about* the environment to connect the learner to the environment that the issue is situated in and engage their motivation and passion . . ."

The above excerpt exhibits a set of embedded, implicit 'technocentric accommodationist'[16] (Chapman, 2007; O'Riordan, 1989) assumptions that infer:

a) EfS involves addressing an 'issue' or a problem (in other words, no environmental problem, no need for EE/EfS), and;

b) the issue/problem is specifically in 'the environment' (somewhere 'out there' other than 'here' where everyday living occurs), and;

c) in order to engage the issue/problem an individual needs to be motivated, which requires them to be passionate (as against being equipped to expect and cope with change as part of everyday life with action competence), and;

d) learning 'out there' *in* the environment has more value than learning 'here' where everyday life occurs, effectively overlooking and negating the fundamental holistic principle articulated in the Enviroschools Kit (2011, p. 51), for example, that the "environment is an all-embracing word that includes ourselves and everything around us – natural features, people and social (human-influenced) features and all the relationships between them", and;

[16] "Technocentric accommodationists believe some accommodations are needed to mitigate the impact of humans on the environment . . .[e.g.] . . . they want an undisturbed environment but also want a nice car, house and holidays overseas." (see Chapman, 2007, p 129).

e) the concept of EfS is a topic that is 'done' while at school or during facilitated activities (as against as a part of everyday activities), and;

f) EfS involves learning *about* the environment (informational), sometimes while *in* the environment, and;

g) learning *about* the environment while *in* the environment establishes a connection to the environment (as against 'with' the environment as an integrated, inter-connected part: reflective of a reductionist perspective overlooking/negating a fundamental principle of holistic philosophy).

Such assumptions, inadvertently consolidating fundamental gaps in epistemology, pedagogy and teacher as well as student attitudes, values and behaviours, are apparent throughout Eames et al.'s (2009) frameworks and the literature reporting them, and are evident elsewhere. For example, the Enviroschools programme literature (Enviroschools, 2008, 2010a, 2011, 2013) employs holistic terms for its learning objectives, yet describes Western mainstream indicators and outcomes, such as text-literacy (Wilson-Hill, 2010, p. 3). Wilson-Hill's (2010, p. 3) finding that text-literacy is instrumental in individual achievement of action competence appears to indicate Western mainstream bias both in terms of understandings of 'literacy' (Edwards, 2010; Fleming & Mills, 1992; Hart, 2010) and the value of various communication and learning preferences (e.g. Fleming & Mills, 1992) and skill sets implicit in action competence relative to the terms of Aotearoa-New Zealand's National Curriculum (Ministry of Education, 2007). These observations of an overarching gap associated with mainstream Western EE/EfS epistemology and pedagogy in the Aotearoa-New Zealand literature are persistent with both those identified in the international literature and of the international literature by this research, as described in Chapter 2.8 of this thesis.

3.10 Chapter Summary

This research's review of the Aotearoa-New Zealand literature has illustrated that while there has been some small progress in EE/EfS research and literature since November 2008, much of this has been necessarily related to

communicating what has been achieved up to that point, confirming on-going and intensifying systemic barriers, and what should be being done officially and at grass-roots, why to keep such important pre-2008 momentum going. EE/EfS and sustainability imperatives are clearly not a priority for government: economic growth and development imperatives are (Eames & Barker, 2011). With such governmental priorities and related public economic pressures, it is clear that funding, support and guidance (such as in an appropriate revision of the original Ministry of Education's (1999b) *Guidelines for Environmental Education*) will not be forthcoming from governmental sources.

There is an on-going, strong political push towards economic development as part of a global community (M.o.E., 2009) and the commercialisation of schools, so that society and schools are increasingly run on a 'business model'. In such an economic and industrial climate there is little perceived incentive for schools or communities to change. Incentive, vision, guidance and leadership are needed. Some authors appear to have recognised this and responded by researching and making available ideas and tools for teachers, volunteers and NGOs to help bridge the gap and better transition change. Researchers (e.g. Brignall-Theyer et al., 2009) have also championed programmes that are particularly effective when done well, such as the Enviroschools programme. Eames et al. (2009) have presented two frameworks as a consequence of their action research to help develop whole-school approaches and action competence in schools. The Enviroschools Foundation (Enviroschools, 2013) has continued to offer resources, guidance and support to schools to expand the Enviroschools network.

A theory has developed as a consequence of this review that such limitations and gaps may be reflective of inherent bias in any piece of research or reporting conducted within a Western reductionist framework. Such theory is consistent with the likes of Cajete (1999), Fien (2001) and Stables & Scott's (2002) argument that, regardless of best intentions, holistic changes are unlikely to be achieved within frameworks arising from Western mainstream thinking and valuing (see Section 2.9 of this thesis). In light of this and Section 2.10 of this thesis, it would be useful for the purposes of this research to

identify descriptions in the literature of approaches to EE/EfS within a framework informed by Māori culture

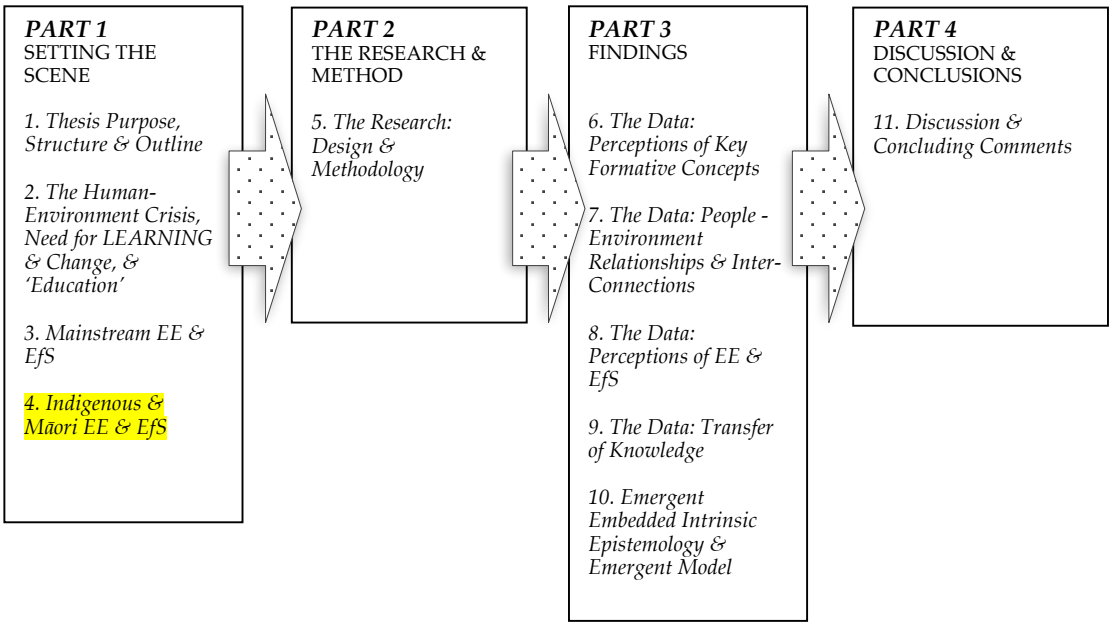
3.11 Chapter Conclusion

This chapter has described environmental education (EE) and education for sustainability (EfS) in the context of formal education in Aotearoa-New Zealand.

Gaps identified in the international literature concerning mainstream Western epistemology, pedagogy and approaches to EE/EfS are persistent in mainstream epistemology, pedagogy and approaches described in the literature focused upon EE/EfS policy, research, programmes and practices in Aotearoa-New Zealand. The overarching gap is that, while it is understood in the literature that attempts to achieve comprehensive holistic change is unlikely to be successful upon non-holistic frameworks engaging non-holistic values and approaches, contemporary efforts in Aotearoa-New Zealand continue to make such attempts: 'a round peg into a square hole'.

Holistic frameworks need to be identified and engaged for EE/EfS to achieve meaningful shifts to holistic attitudes, values and behaviours. Perspectives informed by Māori culture have been described in the literature as being holistic (e.g. Eames et al. 2008; Salmond, 1985). Accordingly, the following chapter will review the literature describing EE and/or EfS or their equivalent within Māori culture in search of an appropriate holistic framework, epistemology or pedagogy for EE/EfS in the context of Aotearoa-New Zealand.

4.0 MĀORI APPROACHES TO ENVIRONMENTAL EDUCATION / EDUCATION FOR SUSTAINABILITY



4.1 Introduction

The purpose of this chapter is to investigate Māori cultural epistemology and pedagogy for environmental education (EE) and/or education for sustainability (EfS) or their equivalent, within the local and international literature. It has become apparent through this review that there appears to be only a little documented evidence of specific approaches to, epistemology or pedagogy for EE/EfS informed by Māori culture.

This chapter will first describe a pervasive conservation ethic intrinsic in Māori culture (Williams, 2004) to which an essentialised Māori worldview will then provide a cultural reference. Next, the sparse evidence of Māori cultural epistemology and pedagogy equivalent to EE or EfS apparent in the literature will be described. Two examples of contemporary applications of understandings and approaches informed by Māori culture in EE/EfS in Aotearoa-New Zealand will lead to the chapter's summary and conclusion.

A glossary of key Māori terms that appear in this thesis is located at the front of this thesis, immediately following the list of tables.

4.2 Pervasive Māori Cultural Conservation Ethic

Aotearoa-New Zealand Māori have a distinctive culture (King, 2003) with a distinctive worldview (Ka'ai, 2003). Prior to the arrival of Europeans in Aotearoa-New Zealand, Māori had developed a conservation ethic (Davis, 1991), with a basic and intimate understanding of people as just one inter-connected and inter-related part of the environment in which they survived and depended upon for survival and well-being (Royal, 2010). This conservation ethic is acknowledged by various authors (e.g. Morgan, 2004; Williams, 2004) as being pervasive within Māori culture in Aotearoa-New Zealand's society.

Clearly such a conservation ethic didn't just happen. King (2003) notes that there is little doubt Māori made mistakes following their arrival in Aotearoa-New Zealand (Upton, 1997, Williams, 2011). Kolb & Kolb (2005) argue that learning tends to occur as a consequence of observation and experience, including from mistakes. Matsueda et al. (2006) further observe that painful or dramatic consequences tend to make lasting impressions and so be effective as lessons. Simmons (1991) suggests that experiencing and surviving such lessons, perhaps watching loved ones suffer or die and witnessing changes bigger than oneself, tend to make lasting impressions upon people reinforcing what is a good idea and what is not (see also such as Diamond, 2003; Fagan, 2008). Authors including Aldrich (2008), Davis (2003), Diamond (2003) and Turner (2005) argue that in such a way a sustainable environmental ethic will either evolve amongst a people consequent to and reflective of the lessons that have been learned so that they may survive indefinitely, or that group of people will perish, and their lineage and culture, vanish. Williams (2011, p. 10) describes the evolution of the pre-European Māori conservation ethic, the remnant of which pervades Māoridom today:

> As society developed, lessons continued to be learned, contributing to an improved knowledge base. Appropriate management strategies

were adopted as a consequence, leading to the emergence of a genuine conservation ethic. This eventually became reflected in the very fabric of society, and was supported by the expression of key spiritual values such as mana, and tapu.

For the Māori cultural conservation ethic to remain pervasive, the associated awareness, knowledge, understanding, connections, attitudes and values, skills and involvements need to have been and continue to be, transferred and reproduced (Aldrich, 2008; King, 2003; Williams, 2004). Western mainstream understandings of education and learning as part of EE/EfS described in the literature (e.g. Ministry of Education, 1999b; Ministry of Education, 2010b) suggest that such transferral requires an epistemological foundation and an identifiable pedagogical framework of intentional approach and implementation towards the conservation ethic's perpetuation.

An understanding of the mechanisms of Māori transfer of awareness, knowledge, understanding, connection, attitude, values, skills and motivation that equates to 'environmental education' or 'education for sustainability' is useful to the purpose of this study. Further, identification and understanding of the ways in which indigenous knowledge relating to the environment is transferred, instilled, imbued or imparted, assimilated and accumulated may be useful to inform and qualify shifts in educational and management pedagogies necessary and advocated in the literature (e.g. Lautensach, 2003) for the realisation of a sustainable future for humanity. As a starting point for consideration of what the literature says about evidence of Māori cultural approaches to EE/EfS, this chapter will now introduce a synopsis of a Māori cultural worldview to provide context for the following sections of this chapter.

4.3 Synopsis of a Worldview informed by Māori Culture

This section represents an engagement and review of the literature and oral-aural knowledge transfer that informs an understanding of a worldview

informed by Māori culture appropriate to the purposes of this chapter and thesis[17].

Royal (2007, p. 35) describes 'the traditional Māori worldview' or the 'Te Ao Mārama worldview' as a means of exploring ideas informed by Māori culture relevant to education theory and practice. Royal (2007, p. 36) also describes the study of worldview as lying in the field of anthropology and being about how people see, comprehend and express their comprehension in the outward forms of culture.

The Māori cultural perspective of the world is widely described as holistic (e.g. Davis, 1991; Royal, 2007; Salmond, 1985). People are understood to be just one part of the surroundings, with everything inter-related and inter-connected by direct relationship, very much including the metaphysical, spiritual, secular, elementary and physical (Morgan, 2004). There appear to be many variations in the telling, depending on iwi and hapu, but these have common threads (Royal, 2012, p. 3). For example, three particularly significant events are common in different versions of Māori cultural stories of creation, each event preceding the other and set in motion by Io, the 'supreme being'. These three events are:

> the creation of the universe, and;
>
> the creation of atua (note that 'gods' is a term commonly used but is not considered an accurate or appropriate description), and;

[17] The post-modernist argument that sweeping inclusivity, generalisations and 'essentialisms' should be avoided (e.g. Miller & Metcalfe, 1998) is acknowledged reservedly by the author. It is noted that the post-modernist perspective arises from positions such that argue that the meta-narratives necessary to describe clear categories of what is or is not included for a generalisation to be qualified and meaningful are not possible (e.g. Gregory, 2002). Stronach (2006, p. 363) suggests, this post-modernist rationale is flawed, not so much in the ultimate accuracy of assertion of infinite variability within populations, but in the logic of the illegitimacy of general characteristics and trends identifying boundaries of inclusivity for description. It is noted here that such essentialisation is, in fact, widely reflected in the literature, including in postmodernist distinctions such as 'postmodernism' and 'essentialism' (Stronach, 2006) is drawn upon for the purpose of this research.

> the creation of the people and their relations, the living things of the forest, the air and the waters.
>
> (Davis, 1991, p. 4)

It is common practice during a hui (meeting) for the general story of creation, connection and relatedness to be retold at the commencement of a leading dialogue as a reminder of where the people come from and of the connectedness and inter-relatedness of all. As I understand it[18], the story goes as follows:

> Out of the nothingness, which some tell as a complete void and others as 'the great potential', the world of spirit evolved. From this world came Io, a supreme being. Io delivered the breath of life (hauora) to this world of darkness, which allowed the light to enter. Because of this, shape and form were able to exist in time and space. Within the world of darkness Io created Ranginui (Rangi), a male atua and Papatūānuku (Papa), a female atua, who were clamped firmly together in an embrace. Rangi and Papa produced children, each with attributes that gave them authority over different elements of nature, and each who inhabited the darkness and spaces between their parent's bodies. Eventually the children began arguing and their conflict forced Rangi and Papa apart. Ranginui became the personification of the sky and Papatūānuku the personification of the land. As Rangi cried at his enforced separation from his love Papatūānuku, the children took shelter in one or other of their parents. This is the origin of rain and, conversely, mist is the lament of Papatūānuku rising to her male. So it is in the Māori worldview that all manner of life originates either

[18] The sources of my information in this regard are a mix of oral transfer and reading over many years. I have done my best to acknowledge sources throughout this section, as is appropriate to my understanding of kaupapa Māori.

directly from the children of Papatūānuku and Ranginui or as a consequence of those ancestors' actions.

(e.g. Davis, 1991; Reed, 2004; Whangapirita et al., 2003)

There is no such thing as 'the Māori perspective' of any one thing (Royal, 2007). There are many different perspectives held by iwi throughout Aotearoa-New Zealand, some with subtle differences, while others more marked, depending on the whakapapa of each particular understanding. For example, while it is true to say that a Māori worldview is holistic and is hinged upon a cosmology based upon whakapapa (genealogy) traceable from the beginning of time to the present, versions may vary from iwi to iwi (Royal, 2012, p. 3). Some versions of creation describe Tāne pushing apart his parents Ranginui and Papatūānuku from their embrace in order to allow light and space into the world, whereas others describe Tūmatauenga (the atua originating war) as the son responsible (Cheung, 2008). Each variation distinguishes the source and lineage of the telling. However, the themes and principles or lore being conveyed by whatever version tend to remain the same (Royal, 2012).

The physical, biological and metaphysical world that includes humans, but in the context of pre-European contact Aotearoa-New Zealand, Māori, is traceable by whakapapa as well as the stories held by and told amongst Māori, back to the event of creation (Royal, 2007). This is not a perspective unique to Māori by any means, but is a theme common to many indigenous peoples articulated in as many ways (Hart, 2010), such as may be illustrated in the words purportedly of Chief Seattle in a letter (1885) to America's President Franklin Pierce[19]:

This we know: the earth does not belong to man, man belongs to the earth. All things are connected like the blood that connects us all. Man did not weave the web of life, he is merely a strand in it. Whatever he does to the web, he does to himself.

[19] http://magna.com.au/~prfbrown/thchief2.html

It follows that, because of their understandings of their relationships and the interconnections and interdependences with all that is around us, the natural environment is an important component of Māori society (Whangapirita et al, 2003).

Māori believe it is important for a perspective to be grounded by first clearly conveying what is the foundation of that individual or perspective; where it comes from, through what markers of evolution, leading to and substantiating the identity of the speaker or the perspective, a process which describes who one is (or what the perspective is) and where they stand (Dr. Hauti Hakopa, personal comment, 2011). So, for example, it is practised amongst Māori that, before an individual speaks their mind in a meeting, they first acknowledge the creation of life, then systematically work through acknowledging ancestors, sometimes from the time of creation, in coming in proximity to their self, identifying their significant mountain, river, lake or landmark (a relation), then their iwi (tribal affiliations), their hapu (their family), their ancestors who have passed (but who like as not may be present in the metaphysical), their grandparents, their parents, and themselves (Boua Huata Holmes, personal comment, 2008). This introductory process is known as 'mihimihi'[20]. Mihimihi's information establishes connectedness and the background to, or substantiation of, the perspective that is about to be offered in any korero (speech or narrative) (Ryan, 1997). Without this being done at least arbitrally, but ideally in full form, an opinion may be considered without standing and weak at best (Matua Hori Parata, personal comment, 2009).

Genealogy, therefore, is an important part of Māori culture, establishing place, identity, relationship and connectedness clearly in the natural order of things within Māori understandings and perspectives of reality (Ka'ai & Hippins, 2003; Royal, 2002). The idea of our surroundings being objectified or distanced, discounting or disregarding kinship, is an alien and difficult matter to Māori, particularly for those brought up in the old ways (Matua Hori Parata, personal comment, 2009). The relationship between Māori and Papatūānuku, for example, is not understood by Māori in a unilateral fashion with the people depending upon a set of resources to be used unconditionally

[20] http://www.korero.maori.nz/forlearners/protocols/mihimihi.html

as a commodity (Joe Harawira, personal comment, 2010). Their relationship is reciprocal in nature, with tāngata whenua (people of the land) relying on Papatūānuku for sustenance, shelter and well-being, and Papatūānuku relying on the people to care for her (Davis, 1991).

Māori hold and view the concepts of hauora, mauri and tapu as being integral with understanding the world around us (Davis 1991; Royal, 2002). The rationale for this is grounded in whakapapa and the story of creation related in the paragraphs above. Simply put and as I understand it, hauora is the breath or essence of life and mauri is the life force that results from hauora having been imbued. Hauora and mauri are closely related, but are subtly different concepts, and as such are sometimes not fully understood and confused even in explanation amongst some contemporary Māori, perhaps less inducted in the old ways (Dr. Hauti Hakopa, personal comment 2011). However, it is commonly understood amongst Māori that everything shares a common origin through whakapapa and has been imbued with mauri through the process of its creation (Williams, 2004).

Because all objects living or non-living have been created and as a consequence have mauri, they are to a greater or lesser degree tapu or sacred, and warrant respect (Dr. Hauti Hakopa, personal comment 2011). The greater the mauri, the greater the tapu, so that those things that are considered very tapu cannot and should not be interfered with, so have limits and restrictions around them (Davis, 1991).

Further, because the Māori worldview holds everything to be inextricably inter-connected, inter-related (Ministry of Education, 1999b), possessing mauri and to a greater or lesser extent tapu, it is understood that no action in the environment is without consequence (Davis, 1991), regardless of how small the entity or the action (Boua Huata Holmes, personal comment, 1990). Observation of this in everyday practices in pre-European contact times maintained balance to a greater or lesser extent throughout the environment (Williams, 2004). Breaches, however, led to not only the adverse tangible effects of consequence to an individual or group, but also to the metaphysical consequences, which sometimes meant death (Davis, 1991). Accordingly tapu

and other resource management mechanisms such as rāhui, tikanga and kawa were respected by Māori in the past (Ka'ai, 2003).

Certain individuals or families within Māoridom are responsible as kaitiaki for the guardianship or stewardship of particular resources in their territories for present and future generations (James, 1993), such as pipi beds, or sacred or otherwise special places or waahi tapu, such as burial grounds. The ways and practice of kaitiaki is referred to as kaitiakitanga (Morgan, 2004) or kaitiakitaka in the Southern dialect of Kāi Tahu (Williams, 2004). Kaitiaki may also be taniwha; metaphysical beings (Dr. Hauiti Hakopa, personal comment, 2011).

Rāhui is a tool or institution used by kaitiaki to restrict or prohibit the entry into a certain area for the purpose of taking for use or immediate use of, resources (Davis, 1991). Rāhui was once established by tohunga, but there are few of the old tohunga left (Matua Hori Parata, personal comment, 2011). Rāhui is now more commonly established by kaitiaki of an area or tribal resource, to allow a resource to replenish, such as after a harvest of a particular bed of pipi, or recover to a point where it can be safely used again, such as after infection amongst a food population, the likes of toxic algal bloom amongst shellfish (Whaea Emma Gibbs-Smith, personal comment, 2010). Rāhui was also a mechanism for allowing sufficient time for tapu to dissipate or be removed from an area following a death or after a breach of tapu (Davis, 1991; Whangapirita et al., 2003).

To be free of tapu or normal and every day is to be noa (Ryan, 1997).

In a traditional sense for Māori, the presence of mauri in everything, and everything being inter-connected and inter-related, means that careful and deliberate consideration needs to be given before any given action, including the extraction and/or use of a resource (Whaea Emma Gibbs-Smith, personal comment, 2011). Certain rites need to be observed in order to change the tapu and lessen the impact on those who sought to use the resource, as well as honour the deity who exercised dominion over the resource and the sacrifice of the resource itself (Davis, 1991). I understand that these general

understandings and the institution of customary practices describes tikanga (Gray, 1990). I understand that a specific practice relative to a specific situation is kawa. So, for, example, appropriate kawa for the removal of some leaves and bark from a certain plant in the bush for medicinal purposes might be as simple as first knowing which plant is which and being informed, literate of and sensitive to any signs of the health of the particular plant selected as appropriate. It would always be appropriate to address Tāne Mahuta, who has domain over the forest and the plant itself, asking his approval for some leaves and bark to be taken for the purpose. It would also be appropriate as kawa to address the plant itself to give fair warning of what is sought, why and what is about to happen, rather than rush at it and attack it without the plant being able to prepare itself (Abraham Witana, personal comment 2009). Understanding and following tikanga and kawa prevents the use of resources without consideration of the potential impacts and sustainability of such use (Davis, 1991).

The preceding section provides a brief review of cultural understandings that underpin perspectives informed by Māori culture. While by no means complete, this establishes a degree of cultural perspective for the following sections and chapters. The following section of this chapter will review perspectives of epistemology, pedagogy and education informed by Māori culture described in the literature.

4.4 Māori Epistemology, Pedagogy and Education

Several authors have written on aspects of Māori education and learning including Bishop (2003), Bishop et al. (2009), Cooper (2010), Durie (2001, 2004, 2010), Edwards (2010), Gallagher (2008), Gray (1990), Hakopa (2011), Hook (2007), Jefferies (1998), Macfarlane (2004), Mahuta (1974), McKinley (2002), Pihama et al. (2004), Royal, (1996, 2007, 2010), Smith (2012), Te Aonohoriu Haig (1997), Te Puni Kōkiri – Ministry of Māori Development (1993), Williams, (2004). I acknowledge these and other authors and guides, including Boua Huata Holmes. I note that, as with the stories of creation, there appears to be no one Māori cultural perspective of, or model of, the conceptualisation of and facilitation of learning or education (Jackson, 2009).

Māori cultural understandings of what knowledge is, how it is generated, recorded, interpreted and reproduced, is shaped by the underpinnings described in the previous section of this thesis (Williams, 2011). Various authors describe the Māori knowledge tradition as 'Mātauranga Māori' (see Royal, 2007; Sadler, 2007; Williams, 2011). The ways in which knowledge is thought about, described, acquired and understood, or the philosophy of knowledge, is described in the literature as 'epistemology' (e.g. DeRose, 2005). Sadler (2004, p. 33) and Williams (2011, p. 3) describe Mātauranga Māori as 'Māori epistemology'. Aldrich (2008) suggests that a cultures' perspective of the purpose of education arises from its worldview and epistemology.

The instructional theory, including principles, approaches, methods, tools and practices of transferring knowledge that are the science of teaching is commonly described as 'pedagogy' (Lawson, 2013, p. 5). Pihama et al. (2004, p. 5) describe and explain kaupapa Māori as the basis of Māori education pedagogy.

Royal (2007) has written authoritatively on the topic of *The Purpose of Education: Perspectives arising from Mātauranga Māori.* The purpose of Royal's (2007, p. 9) writing has been " . . . to expose ideas and themes suggestive of certain directions when one considered the possible contribution that mātauranga Māori might make to contemporary education". However, Royal (2007, p. 8) qualifies his discussion concerning perspectives arising from traditional Māori knowledge in observing that understanding of pre-existing and traditional mātauranga Māori is fragmentary and incomplete. Royal (2007) explains that the nature and perspectives of 'Māori education' have gone through a transition through which some of the knowledge and understanding of the old ways of learning has been disconnected or lost since the colonisation by Europeans in Aotearoa-New Zealand.

A Māori perspective of 'education' is of a process and journey of an individual's development throughout life (Royal, 2007, p. 14). The process of development or 'education' can take a number of forms, including formal, informal institutional, family based, peer based, and play, but it includes being equipped with knowledge and experience which enables an adult to act

independently in a life-oriented way (Royal, 2007, p. 14). Royal (2007, p. 2 and p. 4) has described a mātauranga derived perspective of the purpose of education as being:

> *. . . to facilitate the flow and experience of mana in the individual and in his/her community. The 'fullness' of life was considered to be a function of the degree and quality of mana at play in a person's life. The outward expression of mana in the life of the individual is evidenced only in their skills, attributes and talents – expertise and skill is widely celebrated – but finally in their 'spiritual authority', their intuitive and wisdom filled knowledge and insight of knowing what, when, how and why to do something.*

The following section will describe evidence found in the literature of epistemology and pedagogy for EE/EfS informed by Māori culture.

4.5 Evidence of Māori Cultural Approaches to EE/EfS

Royal (2007), Williams (2004, 2011) and several others have described traditional Māori methods of transferring knowledge (see also Marsden, 1992; Mahuta, 1974; Sadler, 2007; Whangaparita et al., 2010). While the virtues of mātauranga Māori and wānanga have been explained and acclaimed by such authors, including Durie (2010) and Edwards, (2010), only one example of EE/EfS epistemology and pedagogy informed by Māori cultural understandings and approaches has been identified in this research's review of the literature: the *Mātauranga Taiao* programme (Eames et al., 2008; Cooper, 2010, p. 7). The following subsection of this chapter will describe this programme and its implications.

4.5.1 The Mātauranga Taiao Professional Development Programme

Cooper (2010, p. 7) has described the *Mātauranga Taiao* programme as a kura kaupapa Māori professional development programme funded in Aotearoa-New Zealand between 2007 and 2009, and approach to EE/EfS drawing " . . . explicitly and implicitly from Māori epistemology and pedagogies" (Cooper, 2010, p. 7).

'Mātauranga taiao' (Eames et al., 2008; Cooper, 2010) has not been identified in this research's review of the literature as a traditional cultural construct. It appears likely to have emerged as a term describing a contemporary response to a need for meaningful inclusion of EE and/or EFS (Cooper, p. 5) in Aotearoa-New Zealand's bicultural Education Curriculum (M.o.E., 2006). This not-withstanding, Eames et al. (2008) suggest that the *Mātauranga Taiao* programme initiative has been important in consolidating Māori conceptions of and approaches to, mātauranga taiao as a form of EE or EfS.

Māori epistemology, pedagogies, values and principles are commonly described in the literature as holistic (Eames et al., 2010, p.2). Holistic philosophical perspectives have been described in Chapter 2, but in general consider all things as being a composite part of an inter-connected, inter-related and inter-dependent whole (Marietta, 1998). The holistic philosophical and conceptual underpinnings of *Mātauranga Taiao* are very different to other EE and EFS epistemologies (Cooper, 2010, p. 7), most of which stem from technocentric mainstream Western perspectives (Sterling, 2001).

Cooper (2010) explains that Māori knowledge in the area of mātauranga taiao is implicit and that there is very little literature that makes explicit the connection between Māori knowledge, traditions and the environment, let alone in the context of education. Indeed this research's review of the literature has identified little descriptive detail of the epistemologies or related pedagogies associated with the *Mātauranga Taiao* programme in a documented form. This does not necessarily mean that such epistemology and pedagogy do not exist; it may suggest that they are embodied in an oral form consistent with Māori culture and/or are not knowledge for common sharing (as described in Chapter 1 of this thesis).

Eames et al. (2008, p. 21) and Cooper (2010, p. 24) suggest that the Mātauranga Taiao programme has important potential for Māori, Aotearoa-New Zealand and international communities. Practitioners of *Mātauranga Taiao* quoted by Cooper (2010, p. 17) identify that, rather than being a vehicle to deliver the national curriculum, the curriculum strands and content relevant to a community that address the needs of sustaining a local

environment and its communities are able to and should arise out of *Mātauranga Taiao*. This observation by practitioners as described by Cooper (2010, p. 17) appears consistent with Royals (2007, p. 68) ideas regarding the appropriateness of an Education Curriculum for Aotearoa-New Zealand being founded upon mātauranga Māori as 'State of Being' Education.

Eames et al., (2010, p. 21) observe that the Mātauranga Taiao programme has been limited by lack of epistemological, pedagogical and systematic frameworks. Consistent with this, and of significance to the purpose of this research, Cooper (2010) has called for further thinking and research into what might constitute the most effective pedagogy for EE/EfS in the context of Māori-medium education.

Two examples of integration or inclusion of Māori cultural values and/or principles were identified in this review of the literature. These were the *Guidelines for Environmental Education* (Ministry of Education, 1999b) and the *Enviroschools* programme (e.g. Enviroschools, 2013). Both the *Guidelines for Environmental Education* (Ministry of Education, 1999b) and the *Enviroschools* programme have been introduced in the previous chapter. The following subsections will describe the nature and implications of their engagement of Māori culture.

4.5.2 Enviroschools

Section 3.4 of this thesis describes the *Enviroschools* programme (Enviroschools, 2013) inclusion of Māori perspectives and values in its development, kaupapa and framework. A team of Māori educators, Te Mauri Tau, helped develop the Enviroschools programme to include Māori perspectives and values (Enviroschools, 2010a). In light of the literature, including *Agenda 21* (UNCED, 1992) and other United Nations' documents (UNESCO-UNEP, 1976; UNESCO-UNEP, 1978; UNESCO, 2002; UNESCO, 2007; UNESCO, 2009, and others) stressing the need for indigenous people's inclusion in education for sustainability, such involvement and inclusion of Māori in the establishment of the Enviroschools programme and its kaupapa, is a significant event in the history and evolution of EE/EfS.

As noted in the previous chapter by Eames et al. (2006) and Brignall-Theyer et al. (2009), the EE/EfS literature is complementary of the *Enviroschools* programme in all regards yet, as also noted, few studies of educational outcomes, let alone scope of kaupapa Māori inclusion against programme vision across a wide representative base, have been conducted. The *Enviroschools* programme and resources engage English language interspersed with te reo Māori. A Māori language resource (He Kete Taiao) is also available (Enviroschools, 2010a). The *Enviroschools* kaupapa integrates Māori cultural principles and provides excellent resources in the form of a handbook, audio-visual material and a resource kit for teachers (Enviroschools, 2013). The *Enviroschools* programme advocates a whole-school approach and action competence approach to EE/EfS (ibid.).

However, two gaps are apparent in the *Enviroschools* literature and kaupapa (Enviroschools, 2013). The first gap is that the level of engagement of each school, and so benefit to each individual student as well as the school community, is limited to the enthusiasm, interests and level of 'investment', support and understanding of kaupapa Māori and mātauranga Māori by the school staff, hierarchy and Board of Trustees. This in turn, as Jackson (2009) has demonstrated, is relative to the composition and dedication of each local community.

The second gap is fundamental, and has been described in the previous chapter in relation to Eames et al.'s (2009) frameworks for a whole-school approach to learning for, and action competence in, EfS. The *Enviroschools* programme attempts to integrate Māori cultural holistic principles and values upon what is essentially a technocentric accommodationist (Chapman, 2007) framework. Put alternatively to the conclusion of Chapter 3, authors such as Stables & Scott (2002) suggest that attitudes, values and behaviours modelled and facilitated from a technocentric accommodationist framework will likely replicate and perpetuate a technocentric accommodationist perspective (Chapman, 2007). In other words, no meaningful change.

4.5.3 The Guidelines for Environmental Education

The *Guidelines for Environmental Education in New Zealand Schools* (Ministry of Education, 1999b) are also symptomatic of a technocentric accommodationist (Chapman, 2007) policy seeking to integrate Māori cultural holistic principles and values upon a Western mainstream framework. Whereas the *Enviroschools* programme is a non-governmental organisation's concerted and coordinated effort to facilitate change, the *Guidelines for Environmental Education'* (Ministry of Education, 1999b) are a political document, without policy, mandate, and representing a kaupapa with little meaningful governmental support for change (e.g. Brignall-Theyer et al., 2009). Eames and Chapman (2008) have observed in their report a significant lack of robust Māori cultural perspectives being understood or represented in the *Guidelines for Environmental Education'* (Ministry of Education, 1999b).

Several authors, including Royal (2007) and Durie (2010) have eloquently described education within Māori cultural perspectives as a holistic approach to learning. The approach of these authors has been from a perspective of Māori in consideration of the processes and impacts of colonisation and mainstream Western education upon Māori, towards what might be best for the Māori people. In particular, Māori cultural approaches to education have been argued and illustrated to be a more effective and appropriate way of learning than mainstream Western methods for Māori well-being.

4.6 Chapter Summary

- Only one example of EE/EfS epistemology and pedagogy informed by Māori cultural understandings and approaches has been identified in this research's review of the literature: the *Mātauranga Taiao* programme (Eames et al., 2008; Cooper, 2010, p. 7).

- Funding and governmental support was withdrawn during the *Mātauranga Taiao* programme second year, in 2009.

- Māori knowledge in the area of mātauranga taiao is implicit and there is little explicit literature connecting Māori knowledge, traditions, the environment, or related education (Cooper, 2010).

- The *Mātauranga Taiao* programme has important potential for Māori, Aotearoa-New Zealand and international communities (Eames et al., 2008, p.21).

- Education practitioners described by Cooper (2010, p. 17) suggest an Education Curriculum for Aotearoa-New Zealand should arise from mātauranga taiao.

- Two examples of epistemology and pedagogy that integrate or include perspectives informed by Māori culture were identified, with fundamental gaps in epistemology and pedagogy.

- The potential of both the *Guidelines for Environmental Education* (Ministry of Education, 1999b) and the *Enviroschools* programme is limited due to their attempts to integrate holistic principles and values informed by Māori culture upon what are essentially technocentric accommodationist (Chapman, 2007) frameworks.

4.7 Chapter Conclusion

This chapter has described Māori cultural epistemology and pedagogy for environmental education (EE) and/or education for sustainability (EfS) or their equivalent, within the literature.

Gaps identified in the international and Aotearoa-New Zealand literature describing epistemology, pedagogy and approaches to EE/EfS persistent in the literature describing integration or inclusion of principles and values informed by Māori culture upon contemporary mainstream Western frameworks.

Gaps identified in the literature describing integration or inclusion of principles and values informed by Māori culture upon contemporary mainstream Western frameworks are consistent with gaps identified in the preceding chapters. A conclusion is drawn in this regard consistent with that of the preceding chapters: that holistic change may only be achieved on holistic frameworks and that perspectives informed by Māori culture are documented as being representative of holism.

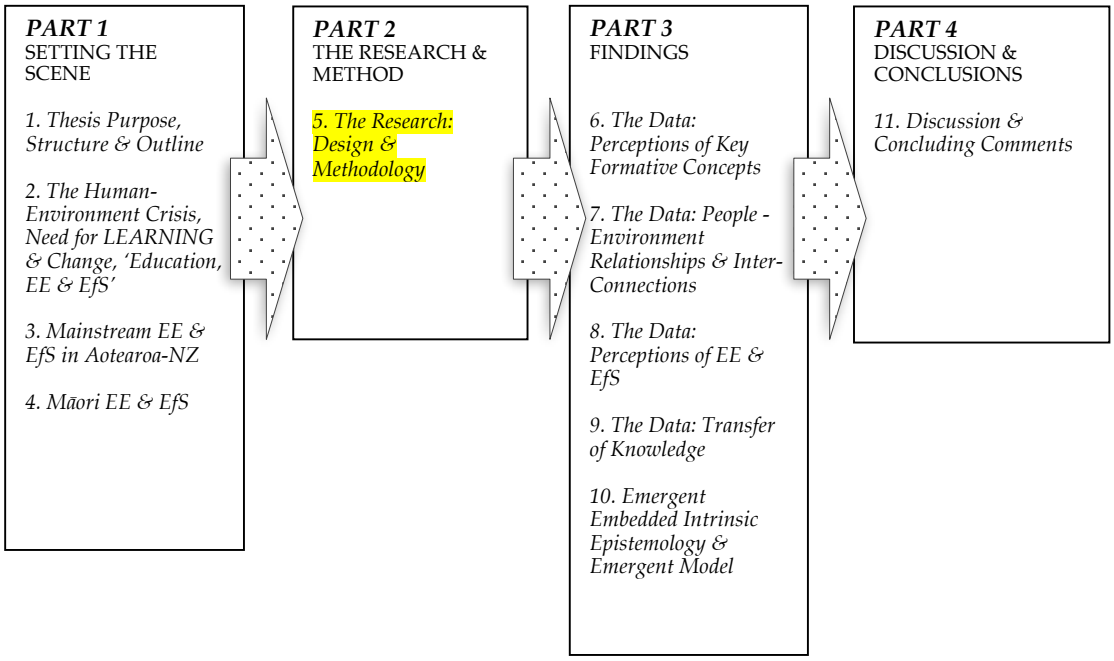
Only one example of EE/EfS epistemology and pedagogy informed by Māori perspectives has been identified in this research's review of the literature, but this was discontinued in the formative stages of its development. Little associated literature has been identified. Indications are that knowledge in the area of mātauranga taiao is implicit and that little explicit literature connecting Māori knowledge, traditions, the environment and related education exists. In order to establish and identify EE/EfS epistemology and pedagogy informed by Māori cultural perspectives an appropriate investigation is necessary amongst an appropriately representative cross-section of Māori.

The next Part of this thesis will describe the design of such research and its methodology.

PART 2:

THE RESEARCH AND METHOD

5.0 THE RESEARCH: Design and Methodology



5.1 Introduction

The first Part of this thesis has established and explained the background, starting points, rationale and focus for this research, including its purpose, objectives and research questions, through a review of the literature presented in four chapters. The purpose of this thesis is:

> *to identify ways in which understandings and approaches informed by Māori culture might help address epistemological and pedagogical gaps in mainstream environmental education (EE) and education for sustainability (EfS).*

This chapter will describe and explain how this research has been designed, upon what philosophical frameworks, using what methods and why, and an overview of how it has been carried out. It will begin by introducing and explaining the philosophical principles upon which the methodology of this research has been built. Then, for the purposes of clarity, it will briefly restate the purpose, objectives and a description of the development of the research questions, before describing the methodology.

5.2 Philosophical Paradigm

In any arguable action or opinion, including a piece of research, a philosophical position underpins the logic and criteria of its justification (Chisolm, 1989; DeRose, 2005; Klein, 2005). Identifying and understanding the philosophical position of a particular research process informs what might best be done to test its validity and what is understood to justify its outcomes as being true and accurate 'knowledge' (Steup, 2011). This section of the chapter identifies and explains the philosophical paradigm within which this research has been conducted.

This research engages qualitative methods. It involves the researcher's pākehā interpretations of Māori participants' descriptions of their own perceptions and understandings of Māori culture. The researcher does not claim to be qualified in the ways of Māori culture or te reo Māori (Māori language). The researcher's knowledge of te reo and kaupapa Māori is limited to personal and professional interactions with Māori individuals and communities, and completion of courses in te reo Māori during teacher training. Accuracy and trustworthiness of interpretations and conclusions have been checked using qualitative tools through grounded theory methodology (Glaser & Strauss, 1967, Charmaz, 2006). Memos were made for reference and cross-checking throughout the research, recording observations and mapping the evolution of my thinking and the development of theory, in a manner similar to that of 'audit trails' (e.g. Cutcliffe & McKenna, 2004; Lincoln & Guba, 1985). This strategy allowed me to trace back through my observations and logic to determine whether findings are robust and develop further theory grounded upon those findings.

Philosophical bias needs to be identified. The researcher identifies a personal position as a general realist (Simmons, 1991), as a biocentrist (Taylor, 1986) / ecocentrist (Leopold, 1949; Rodman, 1983). I understand that realism is not a distinctive philosophical position, but my understanding and stance matches Simmons (1991, p. 14) description of ". . . a *realism* that accepts that those things out there continue to have an existence whether we perceive them or not." (emphasis in original).

The core of biocentric outlooks are described by Taylor (1986 in Armstrong & Botzler, 1993, p. 354) as:

> a) *The belief that humans are members of the Earth's Community of Life (sic) in the same sense and on the same terms in which other living things are members of that Community (sic).*
>
> b) *The belief that the human species, along with all other species, are integral elements in a system of interdependence such that the survival of each living thing, as well as the chances of faring well or poorly, is determined not only by the physical conditions of its environment but also by its relations to other things.*
>
> c) *The belief that all things are teleological centers (sic) of life in the sense that each is a unique individual pursuing its own good in its own way.*
>
> d) *The belief that humans are not inherently superior to other living things . . ."*

As an ecocentrist I concur with Aldo Leopold's (1949) expression of the land ethic, which is an articulation of Western ecological thought that reflects the holistic understandings, perspectives and values rooted in indigeneity (Armstrong & Botzler, 1993). I subscribe to indigeneity-contextualised multicultural perspectives as an overall philosophical position of holism. This research's philosophical framework of realism-biocentrism-ecocentrism-holism engaging holistic indigenous perspectives lends itself to styles of research that allow realistic constructive reflection, progressive adjustment and development of theory.

Two methodologies that I have selected for this research that allow such reflexive and constructive approach to research are Glaser & Strauss's (1967) 'grounded theory' and Berg's (2007) 'spiralling research' approach. Grounded theory is a flexible systematic approach for collecting and analysing data in quantitative and/or qualitative research to construct theories 'grounded' in

the data themselves (Charmaz, 2006). The approaches, theory and methods engaged in this research will be described in the methodology section later in this chapter.

5.3 The Research Purpose

As stated in Section 1.4 of this thesis, and above in the introduction to this chapter, the purpose of this thesis is to identify ways in which understandings and approaches informed by Māori culture might help address epistemological and pedagogical gaps in mainstream environmental education and education for sustainability.

5.4 Research Objectives

As stated in Section 1.5 of this thesis, there are three objectives for this research:

a. To investigate, identify and describe how 'environmental education' or 'education for sustainability' or its equivalent in Māori culture is conceptualised, understood and practiced amongst Māori of Aotearoa-New Zealand.

b. To identify and describe strengths and opportunities that may be adopted, adapted or otherwise inform appropriate and meaningful integration of Māori understandings in environmental education (education for sustainability) policy and practices in Aotearoa-New Zealand.

c. To explore ways in which epistemology, pedagogy, tools or perspectives informed by Māori culture might help address gaps in environmental education (education for sustainability) epistemology, pedagogy, policy and programmes in the context of education and learning in Aotearoa-New Zealand.

In order to meet these objectives, this research addressed the questions described in the next section of this chapter.

5.5 Development of the Research Questions

Chapman & Eames (2007) observation that a significant lack of robust Māori cultural perspectives are understood or represented in New Zealand's environmental education policy or practice helped refine the line of enquiry, gave a meaningful focus and led to the development of the following primary research question:

1. How is 'education for sustainability' or 'environmental education' or its Māori equivalent, conceptualised, understood and practiced and/or facilitated amongst New Zealand Māori and within Māori cultural perspectives?

Three subsequent questions emerged from this primary question during the initial review of the literature as a consequence of grounded theory (Glaser & Strauss, 1967) and spiralling research (Berg, 2007) methodologies (these methods are described later in this chapter):

2. How are key concepts within the constructs of 'education for sustainability' and 'environmental education' perceived and understood amongst New Zealand Māori and within Māori cultural perspectives, and how does this affect their perceptions of the constructs?

3. What is the relationship between people and the environment and how does this affect Māori perceptions, understandings and transfer of knowledge relating to the environment and to a conservation ethic?

4. What can be learnt and gained from Māori cultural perspectives for education of communities and society towards ecologically sustainable lifestyles and practices in Aotearoa-New Zealand?

These four questions are encompassed in the purpose of this research's overarching question:

> *How might understandings and approaches informed by Māori culture help address epistemological and pedagogical gaps in mainstream environmental education (EE) and education for sustainability (EfS)?*

5.6 The Development of the Research Tool

A semi-structured interview was designed as the primary data gathering tool for the purposes of this research[21]. Phellas et al. (2011) explain that a structured interview involves a planned structure with questions prepared for presentation to all participants in a set order and style in order to produce data that can be compared and contrasted towards addressing a particular research question. In this research, an interview schedule was prepared to guide the researcher through the interview in a consistent fashion. The interviews were conducted in a style flexible enough to accommodate different settings, pace and duration of different interviews, as is appropriate to be respectful of each participant in the context of Māori culture.

5.6.1 Rationale for Questions: Contextualising Key Concepts

The first set of questions in the research interview schedule addressed participant perceptions and understandings informed by Māori culture of key formative terms and concepts that may shape and inform their perspectives and understandings of EE and EfS. The following paragraphs explain the rationale for these questions.

Different worldviews and/or frames of reference stemming from each individual's background experiences and understandings influence the ways in which different people perceive the same phenomena or construct (Handel, 1982). Individual frames of reference may mean that two individuals perceive exactly the same message in entirely different ways (Dunlap & Van Liere, 1978). For example, some people perceive the term 'the environment' to

[21] Although participant observation in combination with interview with my participants was a preferred method of data acquisition for this research, the nature of this study, consideration of its scope, geographic and practical limitations (refer to section 1.8, p. 13 of this thesis) constrained the tool primarily to interview.

describe wilderness or nature, or something 'out there' unrelated to people and everyday life (Delay, 1996), while others assume the term to be all-encompassing of things physical, biological and social (Scott, 1984). Bearing this in mind, individual understandings of composite terms and their components, independently and in combination, shape or influence participant's understandings of 'environmental education' and 'education for sustainability'. Therefore the key terms and concepts need to be clarified and understood independently and in combination. The key terms and concepts in this study are:

- the environment
- education
- learning
- sustainability[22]
- environmental education
- education for sustainability

As part of the preparation of the interview, these questions were trialled and discussed with two groups of tāngata whenua. During these trials the term 'life-skills' was commonly engaged in reference to education and the purpose of learning, suggesting a potential for understanding of what is meant by 'life-skills' being important to the purpose of this research. Observations from these trials allowed wording to be refined and led to the addition of a question specifically investigating participant understandings of 'life-skills'.

Interview questions were designed to enable participants to describe their perceptions and understandings of the key terms and concepts without feeling there was a 'right' or 'wrong' response (see Appendix D). These questions formed the first section of the interview to enable participants to

[22] The key term and concept 'sustainability' was not included in the interview schedule (see Appendix D): its significance emerged in the initial interview process through participant response and was further distinguished in the process of analysis. The error in its omission was recognised and manual amendment made to interview schedules, to ensure its inclusion in the interview as part of questioning addressing participant understandings of 'education for sustainability'. 'Sustainability' has accordingly been included here in recognition of its significance and the order of its being addressed. Both the method of monitoring, reflection, adjustment and inclusion, and the placement of 'sustainability' at this point, reflects the spiraling process in this research's development and reporting, appropriate to its grounded theory methodology.

consider the terms themselves and discuss them fully while, at the same time enabling the researcher to get a clear picture of how each participant perceived each term, concept or construct and, in the analysis phase of the study, to allow ease of recording, tabulation and comparative analysis.

5.6.2 Questions: Perceptions of Connections, Inter-connection and Inter-relationship

Growing attention within the literature upon the implications of societal perception and understanding of connections, inter-connections and inter-relationships in the literature relating to sustainability, sustainable development, environmental education and education for sustainability (e.g. Coyle, 2005; Smith, 2013) highlight a need for this research to gauge participant perceptions and understandings in these regards. The interview (see Appendix D) was designed so that participants would feel motivated to freely talk about their perception of relationships between people and the environment, including where, how and when their knowledge of such relationships came from or would be passed on by them or others around them.

This research has been conceived, developed and framed from within the researcher's own pākehā, Western worldview, based on his own background, experiences, interpretations and understandings. The terms central to this study are not only Western terms, they are terms that have been described in the literature as being somewhat vague in nature and definition (e.g. Disenger, 1990; Vaillancourt, 1992) within the Western specialised worlds of education, science and politics in which they have evolved and are, to some degree, still evolving. For example, as discussed in the previous chapter, what is and what is not considered 'sustainable' has been the subject of considerable debate and conflict in Aotearoa-New Zealand since its pivotal inclusion in the Resource Management Act 1991 (Gluckman, 2010). Similarly as discussed in the previous chapter, what is meant by 'the environment', whether within mainstream Western perspectives or cross-culturally, may vary widely from individual to individual (Negra & Manning, 1997).

The constructs formed upon understandings of these key terms provide the current platform for Western capacity to understand human interaction, connectedness, relationship and interdependence with the environment. As was discussed in the previous chapter, mainstream Western perspectives are not the same as those arising from indigenous cultural perspectives (Hart 2010), such as those informed by Māori culture (Royal, 2010). Capturing and understanding perspectives informed by Māori culture of these terms may illuminate disparities or gaps between Māori cultural and Western cultural worldviews and inform ways of perceiving and understanding that are not apparent or easily accessible from within perspectives informed by Western culture. Identifiable differences between perceptions and understandings of composite terms by may be informative to the purpose of this research.

5.6.3 Questions: Transfer of Knowledge

Sadler (2007, p. 33) describes Mātauranga Māori as a knowledge tradition that equates to Māori Epistemology (see Chapter 4 of this thesis). Epistemology is the philosophy and theory of what knowledge is, how knowledge is generated, recorded and interpreted (Williams, 2011, p.3). The science of teaching (Lawson, 2013, p. 5), or the process of transferral of knowledge, is commonly referred to as 'teaching', and the art or particular ways in which a teacher goes about teaching and so transferring knowledge is described as 'pedagogy' (Fowler & Fowler, 1996). Teaching pedagogy, how different teachers go about teaching, is a component of and influenced by, their perception and understanding of educational epistemology.

Understanding how knowledge is transferred, particularly where the transfer of a particular type of knowledge and resultant attitudes and behaviour appears to be very effective or, conversely, poor, is potentially very useful to the purposes of this research in helping understand what pedagogy works and why or does not work and why not. Such understandings may inform modification of teaching approaches in EE/EfS towards becoming optimally effective. Further, it is important that educators have more than one approach with which they are familiar. This equips 'teachers' with multiple tools and approaches to select from for application to suit different situations,

individual learner needs and preferred learning styles (Fleming and Mills, 1992).

A number of questions were formulated to explore component parts of the transfer process including what was transferred, where, when, who was involved and how the transfer occurred, as well as why it was done in such a fashion if at all. From the themes established by the questions, subthemes were developed following the analysis of participant responses and explored through further analysis, tabulation and cross analysis. The questions supplying the data for this chapter were:

- Where does your knowledge of this relationship [between people and the environment] come from?

- How did you learn about this relationship?

- How do you (or would you) pass on this knowledge?

- Do you have a typical approach in passing on knowledge and understanding of the environment and of people's relationship with the environment?

- What sorts of things influence your approach?

- Would you change this approach at any time? And why?

Data was also drawn from participant responses to key questions where they were relevant and conversation during the interview process.

This research asked participants to reflect upon their experiences and practices in facilitating learning with specific attention to relationships and interconnections with 'the environment' and 'living sustainably'. In a Māori context, isolating learning that relates to environmental relationships and interconnections as 'environmental education' or 'education for sustainability'

was an alien and challenging prospect for participants in this study. It became apparent early on in the interviewing process that, because they did not understand or within their understanding, practice 'environmental education' or 'education for sustainability', participants were not able to describe their practices. Another approach to investigating this question was necessary. Participants were asked to imagine or reflect upon past individuals and/or situations needing further development towards understanding self, connections, relationships, inter-dependencies and appropriate interactions with whanau, nature, community and society, articulations of approaches were confident and clear.

Participants were asked to describe their approaches in seeking to transfer knowledge, including why they chose to deliver towards transferring knowledge in the ways they do, as well as the ways in which knowledge relevant to this study came to them. Responses were coded and data collated and cross- analysed to identify themes and strands, which were compared against their original transcripts to check accuracy of what was being understood in isolation against what was said at the time and in context of each interview.

5.6.4 Questions: What's missing: What needs to be done? What is done well?

Constructive criticism is often a powerful means of identifying ways in which existing practices may be improved from perspectives outside of a worldview held by those involved directly in whatever is being sought to be improved (Irandoust & Boury-Brisset, 2006). What is glaringly obvious to a fresh set of eyes may have been missed entirely by a person too close to and involved with a particular issue, or too familiar with things as they are, to the issue to see it (Handel, 1982). Further, people asked for observations feel empowered to contribute to a meaningful outcome and so are involved further in investing towards constructive change (Negra & Manning, 1997). The interview (see Appendix D) was designed to include capacity for participants to identify anything that could be happening in contemporary education and management relating to the environment that is not, and which inclusion might help ensure a clean and healthy environment for future generations.

This information was categorised and included in analysis according to where responses lay.

5.7 The Research Approach

Several approaches and methodologies have been drawn together from the literature of sociological research methods and applied for the purposes of this research. This section will describe the research approaches and methods engaged and explain the rationale for their being employed as most suitable for this particular study. The over-arching research approach is based on grounded theory (Glaser & Strauss, 1967).

5.7.1 *Qualitative Methods*

This study is primarily based on inquiry addressing the research questions described in Section 5.4 of this chapter.

Rickinson's (2001, p. 306) critical review of studies of learners and learning in primary or secondary school environmental education observes that empirical research in EE/EfS is predominantly guided by the theory developed from research that engages quantitative methods. Berg (2004, p. 11) and others (e.g. Charmaz, 2006; Mills & Birks, 2014; Smith-Sebasto & Walker, 2005; Tilbury & Walford, 1996) argue that qualitative methods of inquiry enable more complex and detailed information about a subject than do quantitative methods. This research used qualitative research methods in a review of the literature, in-depth interviews and analysis of the resulting data.

Authors including Berg (2004), Charmaz (2006, 2014), Patton (2002) and Rickinson (2001) suggest that qualitative approaches are suitable to studies using inquiry-based investigations. Basit (2003, p. 151) notes that qualitative research methods enable research to ascertain 'what' people feel, 'why', as well as 'who', 'where', 'when', and 'how' and a quality and richness of data not achievable through quantitative research approaches (see also Dabbs, 1982, p. 32). Qualitative methodology focuses upon how the world is perceived, understood or constructed (Berg, 2004, p. 3; Patton, 2002), and therefore is well suited to investigating perceptions, understandings and approaches informed by Māori culture to EE/EfS. Qualitative methods allow

complexity, nuances and multi-dimensionality of data to be explored and emphasised (Mason, 2002). Further, Rotarangi (2011) has identified that qualitative methods enable exploration of Māori cultural and personal experiences and perspectives, values and beliefs to be conducted in a culturally appropriate manner.

5.7.2 Grounded Theory

This research used a grounded theory methodology as its qualitative approach to review the literature, identify a problem, collect and analyse data, and develop theory. Williams (2008, p. 96) explains that constructive grounded theory enables the researcher to use a methodological framework that provides order and structure to the collection and analysis of data, while accepting changes in the emerging relationships within the data, leading to theorising. The objective of a grounded theory approach to qualitative research is the formation of hypotheses and theory that support the data rather than data being collected that support a specific hypothesis (Strauss & Corbin, 1998). Berg (2004, p. 19) describes such as a 'research-before-theory' orientation. Instead of formula establishing the parameters of the research, general principles and tools provide guidelines for gathering, processing and analysing data, facilitating opportunities for observation of emerging relationships as the study progresses, from which starting points are able to be identified, and concepts and theories are developed (Glaser & Strauss, 1967). Grounded theory is commonly engaged in studies relating to perspectives and studied in context (Starks & Trinidad, 2007). Smith-Sebasto & Walker (2005, p. 28) support Tilbury & Walford (1996, p. 54) in advocating that grounded theory is especially suited for EE/EfS.

Charmaz (2006) explains that the process of a grounded theory approach involves an initial research question (or set of questions) first being posited in response to a research problem within an area of interest or 'substantive area'. Initial data is then collected using methods such as review of the literature or initial interviews, identifying current opinions in relation to the subject of the question. The researcher then interprets and progressively makes sense of data, establishing categories and substantiated starting points for their research. Memos are kept of developing understandings and data is coded

according to categories throughout the process. As understanding of the status quo of the subject develops, emerging concepts are able to be synthesised and organised into propositions, which are then coded and tested against the literature, and through the design and implementation of research tools that engage methods appropriate to the purpose and context (such as interviews, observations or surveys, for example). The research method results in theory grounded in the data of the research, hence 'grounded theory'. The table below illustrates the stages in the process of grounded theory methodology:

Theoretical Methodological Stages of Grounded Theory
1. Identify Substantive Area and the Research Question
2. Collect Data; categorising data and open coding as it is collected
3. Open Code Data (while collecting data)
4. Write memos throughout the process
5. Selectively Code and Test Emerging Theories through Theoretical Sample
6. Identify Theoretical Codes
7. Read the Literature
8. Write up Emergent Theory

Table 5: Theoretical Methodological Stages of Grounded Theory

(Adapted from Charmaz, 2006, p. 11)

In the application of Grounded Theory to this research, for example:

1. the substantive area of the research is environmental education and the ecological sustainability of humanity. Having been away from environmental education literature since the completion of my Master's degree in 1998 and having not been involved in formal teaching and environmental education for several years, this research started with a general research question "what is the status of

environmental education and the ecological sustainability of humanity?".

2. My initial research in the literature collected data that indicated that: a) humanity's future is threatened and, b) while there had been a significant increase in programmes, activity and publications, very little progress towards the holistic goals of environmental education to help secure an ecologically sustainable future had been made (the 'current opinion').

3. In making sense of what I understood of the status of environmental education and the ecological sustainability of humanity (the 'what'), I open coded data engaging the questions 'why?', 'who?', 'where?', 'when?' and 'how?'

4. using memos throughout the process.

5. The concept (emerging theory) that emerged suggested that environmental education has not achieved holistic change because its epistemology is predominantly based on mainstream Western perspectives and understandings, which are the antithesis of holistic principles: the changes that are required cannot be made using the same thinking and practices that created the need for change.

6. Holistic perspectives were identified as desirable (theoretical code), and;

7. examples of holistic perspectives, understandings and practices within indigenous cultures were described in the literature, including within Māori culture;

8. A proposition emerged through which to investigate Māori cultural perspectives and understandings and perhaps identify alternative epistemologies for environmental education (emerging theories);

9. This proposition has led to the design and implementation of a research tool for the purpose.

Grounded theory, and indeed the research enterprise in general, is often represented in methods texts and courses as a linear process (Berg, 2004, p. 19; Charmaz, 2014). Charmaz's (2006, p. 11) representation of grounded theory, as summarised in Table 5 (see p. 119), depicts a rather linear process, in which the literature is reviewed towards the conclusion of the research process: only after a research question has been identified and formulated, after data has been gathered and coded, after observations have led to hypotheses and theories developed. In practice, grounded theory methodology involves perpetual looping back to the literature, observations and hypotheses, checking initial concepts and adjusting observations against what (if anything) related is said in the literature as trends emerge from the data towards developing theories that might explain what has been observed through the research process. This approach is flexible to situations and developments within the research, and can complement other qualitative approaches (Charmaz, 2006). In this process, what is learned may progressively subsume what was thought before: an evolution of thinking and theorisation occurs (Gloster, 2000). In effect the grounded theory research process reflects a spiralling process of learning.

Authors such as Smith-Sebasto & Walker (2005, p. 30) describe grounded theory methodology as a circular or spiralling evolutionary process. Gloster (2000, p. 675) describes such a successive cyclic, if not vortical or spiralling process of the generation and progressive refinement of questions, hypothesis and emergent theory as retroductive theoretical drift. Berg (2004, pp. 19-20) argues that such a spiralling approach is appropriate for the research enterprise in general. I find this spiralling approach applied to grounded theory methodology to be logical, organic and common sense[23], and so appropriate to the nature and purpose of this research. A spiralling approach has been engaged in this research, and is explained in section 5.7.3. of this thesis. Charmaz's (2006, p. 11) model of the grounded theory process has been

[23] Charmaz (2014, p. 18) notes "A pivotal insight or realization (sic) can happen anytime during the research process. Grounded theorists stop and write whenever ideas occur to them.

adapted to simplistically illustrate spiralling grounded theory methodology applied to this research in Table 6 below.

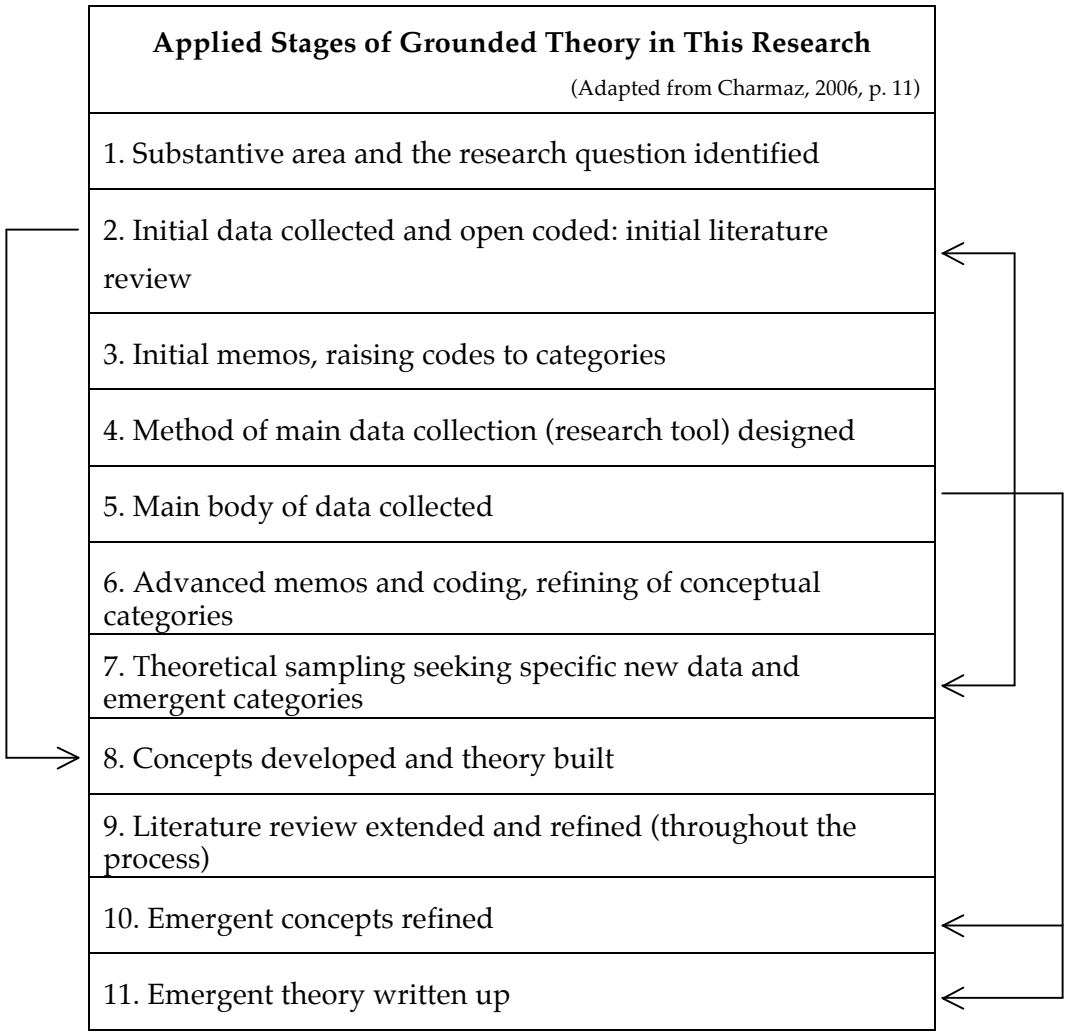


Table 6: Applied Stages of Grounded Theory in This Research (Adapted from Charmaz, 2006)

5.7.3 Spiralling Research

Berg's (2004) 'Spiralling Research' model is complementary to the over-arching constructivist, reflexive approach (Charmaz, 2006) to Grounded Theory in this research. Its function is equivalent to a spiralling feedback evaluation loop (Manning, 1986, p. 122) with which I am familiar as a teaching, resource and systems management tool, and with the principles of reductive theoretical development in action research (Gloster, 2000, p. 674). In using a feedback evaluation loop, objectives are first established against an identified need, a strategy is then developed, implemented, monitored,

assessed and the status is fed back, on which information adjustments are made to optimise performance, implemented, monitored, assessed, fed back, adjusted and re-implemented, and so on. Berg (2004, p. 19) describes the application of a spiralling research approach as follows:

> . . . you begin with an idea, gather theoretical information, reconsider and refine your idea, begin to examine possible designs, re-examine theoretical assumptions and perhaps even your original or refined idea. Thus, with every two steps forward, you take a step or two backward before proceeding any further. What results is no longer a linear progression in a single forward direction. Rather you are spiralling forward, never actually leaving any stage behind completely.

This approach lends itself to the methods of reflexive, constructive grounded theory and as such facilitated the optimisation of the overall research approach for this thesis.

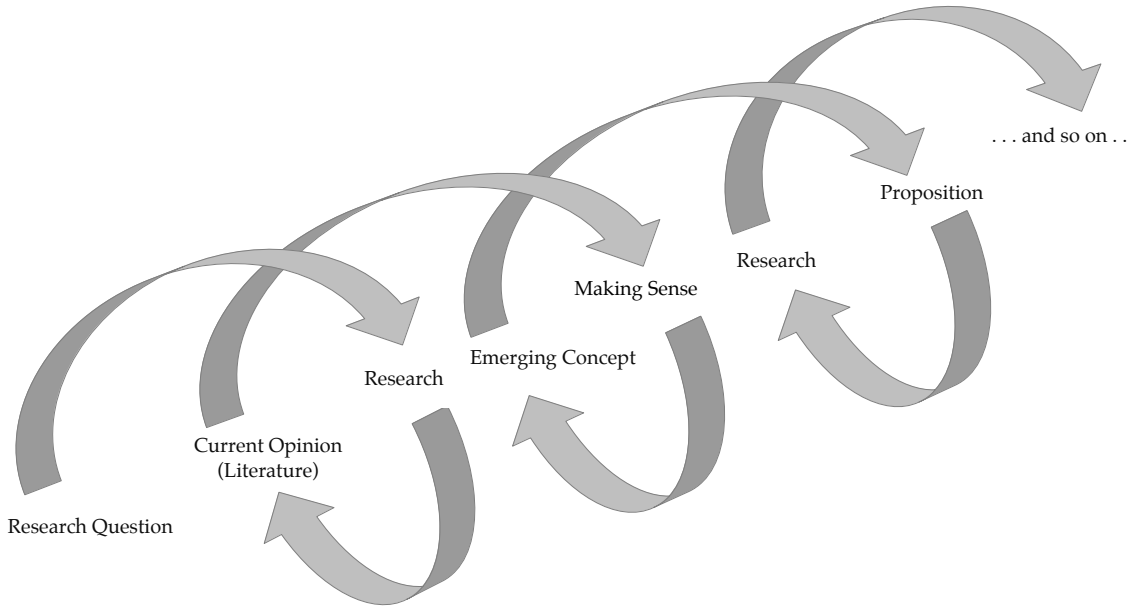


Figure 3: Spiralling Research Approach and Feedback Evaluation Loop Applying Grounded Theory (Adapted from Manning, 1986)

In the application of a spiralling research approach through grounded theory, a research question is posed and research undertaken, such as investigating the literature informing a view of current opinion, from which concepts, propositions and theories emerge for further research and testing. This process that occurs within and throughout the grounded theory framework of this research (refer to table 6) is illustrated in Figure 3, above. Subsequent observations inform improved understanding and modify developing opinion, so that new propositions and theory emerge, and so on, leading to a point of saturation or conclusion and so theory grounded in the data, which can be further tested or evaluated against the data.

5.8 Method

5.8.1 Literature review

A review of the literature was engaged in a manner reflecting the over-arching research method of grounded theory engaging a spiralling research approach, as described above. In a classic grounded theory research approach (Glaser, 1978), the literature might not be drawn upon until after observations have been made, data gathered and theories developed; the review of the literature situates and validates the emergent theory in current literature. This research takes a more constructivist approach (Charmaz, 2006), starting with a research problem and drawing upon the literature and observations to provide initial data and clarify research questions. During the initial research phase of this research, the literature review was used to scope the field of study, updating the researcher on the developments in environmental education since his last research (1998), as was described earlier in this chapter, identifying gaps as starting points, and developing initial theory and an initial research question for this study[24].

The pedagogical approach of this thesis's review of the literature reflects a thematic development of inquiry, investigation and theorisation in keeping with qualitative research using a spiralling approach to grounded theory methodology. As such, generalist, theoretical and speculative literature is not differentiated from literature based on empirical studies and national or

[24] Just to clarify in case a reader might wonder how groundedness can be retained when the starting points are informed by concepts and critiques derived from a wide range of literature, in my particular methodology I consider reading of wider concepts to be an essential stage of grounded theory.

international reports in the literature review nor, unless stated otherwise, is it differentiated from research or literary work undertaken in the United States, Australia, Aotearoa-New Zealand, or the United Kingdom, or work undertaken in schools, community and higher education settings. Rather, the literature review chapters provide the reader with a detailed thematic summary overviewing what has occurred and the current state of play, as part of the flow of logic and development of the line of inquiry, research and findings of this research. This is appropriate to the practical, applied nature of the study, as well as the over-all global scope of the problem and need for urgent remedy over and beyond the Aotearoa-New Zealand focus of this thesis' research question.

With the starting points identified and initial theory developed, an appropriate methodology was then further researched and grounded theory selected as appropriate to the nature and purpose of this research. The research was designed and conducted and data gathered.

Once gathered, the data was analysed and initial themes began to emerge. Exploration of the literature then became more focused. Themes that contributed to the framework and understandings necessary for the comprehension of the issues related to the topic of this research were identified and researched in order to develop understanding of what was said in the literature about each theme. New theory emerged at each stage, which was similarly tested against the literature. Threads were progressively developed, hypotheses tested and arguments were progressively identified, pursued and noted.

This reductive procedure continued throughout the preparation of this thesis. Each chapter follows on from the last, reflecting upon the implications emerging from the previous chapters, effectively asking of these 'so what?' in terms of the wider picture and, particularly, in terms of the purpose of this study. This spiralling constructive process has led to an extensive review of the literature in the preparation of this thesis. A full bibliography of literature reviewed is located at the rear of this thesis. It has facilitated a spiralling flow and development of concept and theory from the initial research question in

consideration of new information as it emerges from the literature. The research process leads to and through, the research and data presented in this thesis to inform the discussion and conclusions, in a clear and logical flow.

5.8.2 The Participants

A sample of fourteen tāngata whenua participated in this study. Seven participants were male; seven female. It has been discussed and agreed by participants that, if agreed, inclusion of their identity is appropriate to Māoritānga and the nature of this research, and lends the weight of their mana to the standing of this research and its findings. All but two participants have agreed to be identified. One participant who did not wish to be identified explained that the nature of their work meant that their opinion, expressed through a thesis within a different region of Aotearoa New Zealand than their own hapu and iwi, had potential to negatively affect their career and possibly, their personal relationships. This not-withstanding, this participant (T2) chose to include identification of their iwi, age and gender to assist the study description of representation. Another participant (T14) preferred not to be identified at all. A list of participants who have participated in this research is presented with their tribal affiliations in Table 7 on the following page.

Code	Participant	Tribal affiliations
T1	Tahu Potiki	Kai Tahu
T2	Identity confidential	Ngāti Maniopoto
T3	Rawinia Puna	- Kai Tahu, Kāti Mamoe, Waitaha, Hawea, Rabuvai, Moriori - Ngāti Kahungunu, Ngāti Tuwharetoa, Ngāti Porou, Ngāti Hine
T4	Hori Parata	Ngāti Wai
T5	Abraham Witana	Ngāti Manawa, Te Rarawa
T6	Linda Faulkner	Ngāti Rangi, Whanganui
T7	Tui Shortland	Ngāti Hine
T8	Dr. Hauiti Hakopa	Ngāti Tuwharetoa
T9	Zack Makoare	Te Whatuiapiti, Ngāti Porou
T10	Hinewai Ngatai	Ngāi-te-Rangi
T11	Te Moengarau Hemopo	Ngāti Tuwharetoa
T12	Chris Holtham	Kai Tahu
T13	Dr. Pip Pehi	Ngāpuhi, Ngāruahine
T14	Identity confidential	Affiliation confidential

Table 7: List of participants in this study and their tribal affiliations



Figure 4: Map of Rohe or Tribal Areas of Aotearoa-New Zealand showing main tribal affiliations of participants in this study

Participants' eligibility was determined upon the basis of their being Māori who are tohunga (expert), kaumātua (elder[25]), mātua (male adult), whaea (female adult), rangatira (chief), kaitiaki (guardian) or individuals otherwise representative of hapu or iwi from throughout Aotearoa-New Zealand. An original list of 32 potential participants was identified and cross-checked with the assistance of Boua Huata Holmes and Dr. Jim Williams as to appropriateness, adjusted and means of contact identified, as well as best approaches for each potential participant. Some potential participants were approached directly during hui and wānanga at centres and Marae around the country, while a few were approached by way of telephone call or by email.

Some interviews occurred upon first contact, while others were arranged during first contact for a time shortly thereafter. Wherever possible, an information sheet (see Appendix B), consent form (see Appendix C) and sample of the questions (see Appendix D) were forwarded by mail or email to participants prior to the interview for information and consideration. In all cases time was allowed to ensure the participants had time to read, discuss and understand the information sheet, consent form and questions before their consent was sought by way of completion of the consent form.

The University of Otago's Ethics Committee (2011) requires the completion and signature of a consent form by prospective participants in a research by interview. In the case of this research several participants declined to sign the consent form yet wished to participate fully in the study with explanations such as:

> *I understand what the university wants, but what it wants as a formality does not sit with the way that we see and do things. My consent is my being here, with you, speaking about these things in this way*[26].
>
> (Dr. Hauiti Hakopa)

[25] Kaumātua describes either male or female elder, whereas koroua describes a male elder and kuia a female elder

[26] While this matter is not of particular significance to this research's line of inquiry, its conclusions or its outcomes, it perhaps suggests a disparity or gap within the University of Otago (2011) procedures for interviews, particularly in regard to research involving cross-cultural investigation.

From the original list of potential participants, twelve agreed to participate. Of these, seven were successfully interviewed. A number of variables interfered with the research's ability to schedule and secure interviews with prospective participants including illness, the deaths of two prospective participants, tangihanga[27] and disruption of travel due to weather events leading to erosion of budget. A critical number of twelve interviews were considered necessary from which to draw sufficient data to validate this study. More participants were needed. A contingency plan was implemented using an alternative method to respectfully approach and engage appropriate participants. An appeal was made to the New Zealand Environmental Protection Agency's National Iwi Network members by email for recommendations of kaumātua to approach and/or expressions of interest. A further thirteen tāngata whenua expressed interest in participating in the study. Of these, a further seven participants were successfully interviewed.

Transcription and analysis was initiated as data was gathered. It became apparent that the data was saturated: the same themes were emerging and repeating strongly. It was decided in consultation with my supervisors that, given the difficulties in securing interviews in balance with the extent of some interviews, as well as the consistency, richness and saturation of data, sufficient data had been secured for the purposes of this research.

5.8.3 The Interviews

Interviews were conducted between 1 June and 22 November 2011 as the main method of generating data for this research. Sixteen research questions were posed to each participant during informal interviews in a range of locations and situations, but predominantly in participants' homes over a cup of tea, at times interspersed with the goings on of whanau in a Māori home. Some occurred in a similar fashion at Marae, while two occurred in a relaxed, private setting at a place of work. Two interviews were conducted over skype at the participant's request, and one was recorded digitally as a korero guided by the interview questions and sent on a memory stick by mail. One was similarly sent as an email response to questions. Details of interviews,

[27] The process of dealing with death, grieving and burial : http://www.dnzb.govt.nz/en/tangihanga-death-customs

including participant identity, designated code, as well as location, situation, mode and duration of interview, have been tabulated and are attached at the rear of this thesis as Appendix E.

During interviews, each participant was reminded of their voluntary participation, the digital recording of the interview, and later transcription. Participants were advised that they could withdraw from the study if they chose to do so, both the transcript and digital recording would be destroyed.

Recording was stopped during interviews in order for participants to address interruptions. Once participants were ready to recommence the interview, recording was restarted and subjects refocused where necessary with a summary of what they were saying prior to the interruption. The current question was then restated. Four interviews were completed in around an hour, with several covering between two and three hours, and one covered five hours. Two interviews became extended and spanned three days of interactions, travel and whanau-based activities which, upon reflection, were intended by the respective kaumātua to demonstrate examples of what they did, where, when, how and why. Significant observations have arisen from the data obtained from analysis of responses.

Recordings of interviews were saved to a digital file, which are to be kept in a secure location as a record by the University of Otago for five years following the completion of the research, and then destroyed. The digital recording of each interview was transcribed by the researcher in order to reinforce and embed the aural and oral dimensions of the data while recording it in written form. The data and results of this study reflect, to some extent, my interpretations of interview material. Controls on subjectivity include reference of transcripts back to participants, as well as constant cross-checking of coding against the context of full transcripts. Each subject was asked to view their transcript and confirm it was a true and accurate record of the interview. Interpretations of korero delivered in te reo Māori were provided by the respective participants and the researcher's interpretations of Māori terms were checked against participant understandings in context with their

use of terms within the transcript. The following section describes the method and process of analysis of the data gained during interviews.

5.8.4 Analysis

In this study the initial research question and review of the literature led to the proposition and development of further research questions to be investigated. From this base, specific questions were designed for the interviews. Simple code identities were allocated to each participant and their transcript for the purposes of tabulation, and in the cases of protecting identity, maintaining anonymity. Participant codes were T1, T2, and so on through to T14.

The analysis went through successive stages. These are illustrated in Table 8 below:

Analysis Stages
1. Identification of themes emerging from literature & allocation of codes
2. Identification and initial coding themes in data in transcripts
3. Development of initial theories against the emerging themes
4. Extraction and collation of data by initial theme
5. Identification, categorisation and progressive coding of sub-themes
6. Tabulation and analysis of emerging trends and theories
7. Cross-tabulation and analysis of emerging trends and theories
8. Testing emergent theories by re-examination of transcripts and the literature

Table 8: Stages of analysis

Initial data codes were developed according to themes and sub-themes that emerged in the review of the literature and from the initial analysis of collected data sets. The table below illustrates the initial thematic categories used for analysis:

Theme	*Sub-theme*	*Code*
Relationships between people and environment	Connectedness Disconnectedness Relatedness	RP C DC R
Key terms and concepts	The environment Education Learning Sustainability Life-skills Environmental education Education for sustainability	KTC E ED L S LS EE EfS
Transfer of Knowledge	What Who When Where How Why Typical Approach	TK What Who When Where How Why TA
What needs to be done		WD?

Table 9: Initial thematic categories and codes for collation and analysis of data

The first stages of analysis involved establishing and testing the initial themes by reading and listening through the data of each participant tāngata whenua transcript, identifying and highlighting and coding themes within the text as they emerged, transcript by transcript. Sections of coded data were then extracted from each transcript and collated under subthemes. A sample extract of this method citing responses coded under the key concept of 'the environment' is provided below as an example. The first participant's extent

of entry here is partial, in order to demonstrate how several entries appear when recorded using this method:

> KEY TERMS & CONCEPTS: 'THE ENVIRONMENT'
>
> 'The environment' to me is what sustains us and what feeds us. T2
>
> When I look at the land I see it as something that provides for us. And it has, e nehera, for all our generations back to our first ascendant. The land is what's provided our, our culture and our heritage. T2
>
> When I think of protecting the environment, I think of making sure that, in times to come, my kids, my grandkids and their grandkids still have a place to go and feel that warmth that the land can provide. T2 . . .
>
> The environment? Is all of what we live and breath, in and around that sustains us to live on this earth. T3
>
> From a Māori perspective the environment is the people, and the people are the environment. T4 . . .

Theories began to emerge as patterns in data collated under themes became apparent. These were coded and further categories developed. Coding was progressively adapted and became more specific as more data was collected and processed, and as themes became clearer. Theories began to emerge, which were noted, explored, developed and described in memos. Once all data was collected, it was coded and categorised thematically. Conceptual categories were identified and themes clarified and tested against the emerging theories using coded tables. Data was sometimes copied into more than one category. Cross-analysis through comparison techniques (Charmaz, 2006) by way of tabulation of codes throughout the process allowed clear visual representation of trends, with strong representation showing up as bands in the data, and gaps being similarly apparent in the data. For example:

Table 10: Example - presentation of data: "What does the term 'the environment' mean to you, if anything?"

Participant	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14
The Environment is:		SU C WFR NE AE	SU C WFR NE AE WS	 C WFR WC NE AE M	 C WFR WC NE AE M WS	SU C WFR NE	 WC AE WS	SU C WFR WC NE AE M WS	 C WFR NE AE WS	SU C WFR NE WS	SU WFR NE AE WS	SU C WFR NE AE M WS	 WC AE WS	SU C WFR NE M
The Environment is not:	NR	SD UE	UE	SD UE	SD UE	UE	SD		UE	SD	SD	SD		UE

Key:

AE	All Encompassing/Holistic	C	Connected
M	Mauri / Metaphysical	NE	Natural Environment
NR	No Response	SD	Separate / Disconnected
SU	Sustains Us	UE	Un-natural Environment
WC	Western Construct	WFR	Whakapapa/Family/Relatedness
WS	Wairua / Spiritual		

Thirty-three tables, such as Table 10 above, were developed in the course of the analysis of data in themes, subthemes and categories. The themes, subthemes and categories that emerged were coded and tabulated for analysis. Two hundred and forty-three codes resulted from progressive analysis, theorising and categorising, some of which are represented in multiple tables, while many are not. In presentation of tables in the data chapters of this thesis, codes are interpreted for reference below each table, as demonstrated in the example Table 10 above.

Four key themes have emerged in this study. Three of these four key themes ('key concepts'; 'relationship and interconnections between people and environment'; 'what needs to be done?') emerged from consideration of the nature and purpose of this research in light of information gained from the initial review of the literature, as described in Section 5.5 of this chapter. These three key themes were broken down into sub-themes and categories during the process of analysis. Their appropriateness was reinforced by the interview data and subsequent reviews of the literature. Further sub-themes and categories became apparent through responses as interviews progressed, as well as emerging as a consequence of tabulation, examination and re-examination, grouping and re-grouping statements during analysis. The fourth key theme became apparent in this way, emerging from the interview

data. Strands and threads of themes, sub-themes and categories are very apparent in tabulated data, as is evident in their presentations within this chapter. Strong lines of common coding contrast areas of weaker response, flagging areas of comparative interest. The following themes and sub-themes provide a framework for the organisation of results:

- Key Concepts
    - The environment
    - Education
        - Perceptions of the Western paradigm of education
        - Perceptions of the nature of education
        - Perceptions of the key objectives of education
        - Perceptions of a Māori approach to education
    - Learning
    - Sustainability
    - Life-skills
    - Environmental education
    - Education for sustainability
- Relationship and Interconnections between People and Environment
    - Perceptions of relationship between people and environment
    - Perceptions of inter-connectedness
    - Perceptions of disconnectedness in the DSP
- Transfer of Knowledge
    - What knowledge is transferred?
    - Where is knowledge transferred?
    - When is knowledge transferred?
    - Who is involved in transferring knowledge?
    - How is knowledge transferred?
        - Learning styles/Communication preferences
        - Educational aims: inform/guide/facilitate
        - Education in, about or for the environment
        - Methods of engagement

        - Timing, use of timing and duration
        - Approach
        - Tools
        - Setting
        - Activities
        - Content
    - Why is knowledge transferred in these ways?
- What needs to be done as education that has the best hope of securing an ecologically sustainable future?

Analysis involved the development of two hundred and forty-three codes with concurrent memos, producing the 32 tables with which the data is presented in this thesis (as mentioned above).

Concepts and theories were developed through the use of memos, which were kept throughout the research and analysis process and constantly checked against the data. The use of memos throughout the research is an important part of grounded theory process (Charmaz, 2006; Strauss & Corbin, 1990). Glaser (1978, pp. 83-84) describes memos as the theorising write-up of ideas about codes and their relationships as they strike the analyst while coding and developing concepts. He explains that memos might be a sentence, a paragraph or a few pages, but they exhaust the analyst's momentary ideation based on data, with perhaps a little conceptualisation, in a constructive process of the development of theory arising from and explaining the data. In the case of this research the process of research and analysis memos were effectively notes to myself recording and contemplating aspects or patterns noticed within and between codes and categories, and about possible causes and relationships, with hypotheses, theories and 'next steps' arising. Memos were initially taken on dictaphone, transcribed and kept in a Warwick 240 page A4 writing book, but as the research progressed I changed this practice to writing memos on A4 printed sheets of tabulations, and in digital form and highlighted amongst draft chapters or in stand-alone notes for referral. Tabulation, memos, full transcripts and, concurrently, digital recordings were re-examined independently and against each other to check observations and validate the analysis process and conclusions.

An example of a memo written in consideration of initial trends observed in the first tabulation of data under the theme of 'Transfer of Knowledge' and sub-theme of 'How?' (and on an initial print of the table itself), is:

> Showing / talking / and doing (VAK) are clearly preferred modes; read/write (R) are not high priority. *does this suggest cultural propensity to perform poorly in read write education settings (schools and higher education?). **What does literature say re. compatibility of read/write school/education system with Māori cultural worldview?*
> Strong guiding and informing.
> Opportunistic and flexible styles, selected to purpose /individual / situation / need.
> Group and individual situations equally important, but approach to 'delivery' differs.
> Informal preferred, but subject to context.
> ALWAYS through whakapapa, connection.
> Pitch in a MEANINGFUL time, place, situation people relate and connect with.
> **What is practical and meaningful in current curriculum? Again link to poor performance learners in read/write society? – lack of meaning? boredom? I believe likely so. Anyone else thinks this? Find out - literature.*
> Sensitive issues managed through the complexity of message – protection of information.
>
> (from researcher's notes)

Continual comparison of the data with respect to gaps, strengths and potentials identified in the literature, tāngata whenua participant descriptions of learning, and evidence of a commonly pervasive conservation ethic within participant data, led to the recognition of an emergent intrinsic Māori epistemology for 'environmental education' and so the development of a theoretical framework for sustainable education.

Participant interview data provide insight to ways of thinking and understanding reality alternative to mainstream Western perspectives, so are

presented as recorded, with only minor editing of redundant words or repetition. In a few cases words have been inserted in square parentheses in order to correct syntax or link key statements around redundancies. While I acknowledge that individual participant comments have been isolated to some degree outside of their context, I note that my interpretations of participant comments are made with reference to the specific dialogue of each participant, with correlating supporting data resulting from analysis.

In order to test the theory of a holistic educational epistemology and pedagogy equating to optimal EE/EfS being embedded within Māori culture, all available data was re-examined, including original recordings of interviews and their transcripts, tabulations and cross-tabulations. It was further theorised that three thematic aspects were critical in determining such presence:

a) what outcomes are commonly described as being sought by each participant as the facilitator and/or learner (the 'desired outcomes');

b) what tools, approaches, applications and process are described by each participant, and;

c) what correlations or commonalities with formative concepts underpinning mainstream Western aims for EE/EfS are evidenced?

All available data was re-examined upon this thematic framework and tabulated so patterns of occurrence could be observed and significance analysed.

Participant responses in interviews have provided a wealth of qualitative data. Thematic analysis, grounded theory and spiralling methodology have allowed me to examine the data to identify and explore commonalities, differences, disparities, connections and relationships within participant perspectives and experiences informed by Māori culture relating to education and, in particular in relation to environmental education and education for sustainability.

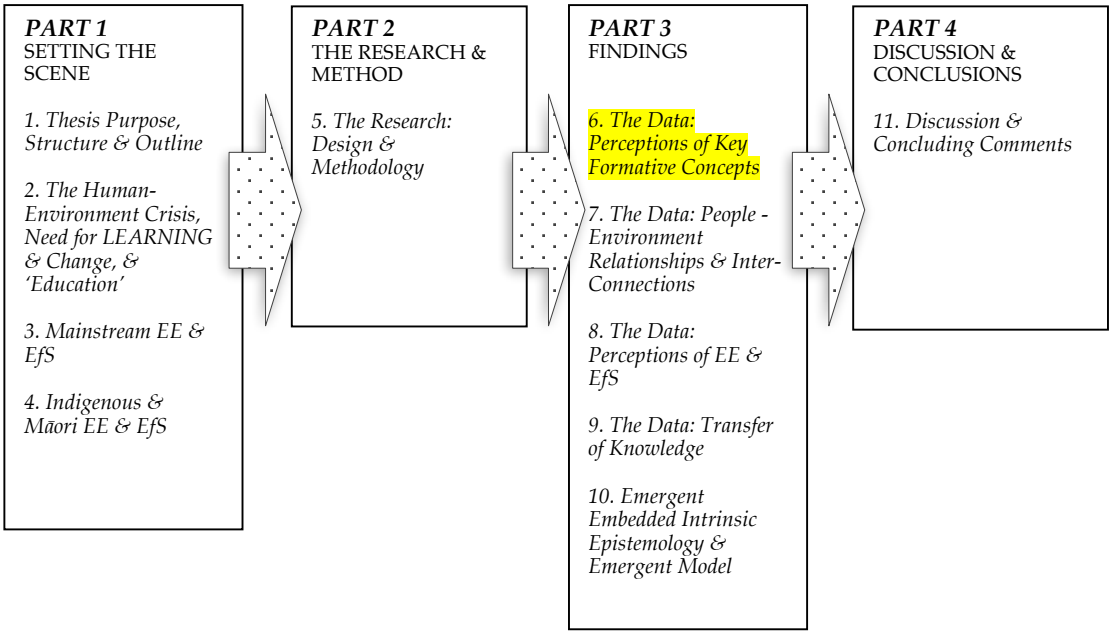
5.9 Conclusion

This chapter has described the development and design of this research. A Grounded Theory methodology and the related qualitative methods engaged in this research have been explained, including how data has been gathered and recorded, processed and presented, and how such process has validated the research's findings. Five sets of results have emerged from the analysis of data as has been described in this chapter. These will be presented in the following five chapters of Part 3 of this thesis.

PART 3:

THE FINDINGS

6.0 THE DATA: Participant Perceptions of Key Formative Terms and Concepts



6.1 Introduction

The preceding Parts of this thesis (Part 1 and Part 2) have established the need, context and methods of this research. This Part of the thesis reports the results and discussion arising from the analysis of five sets of participant interview data in five chapters. An epistemological and pedagogical framework and theory emerges in the fifth data chapter, Chapter 10.

As the previous Chapter has described, this research engages a grounded theory (Charmaz, 2006; Glaser and Strauss, 1967) and spiralling research (Berg, 2007) methodology. The first three chapters of this Part (Chapters 6, 7 and 8) ground and provide context for the data presented in the Chapters that follow (Chapters 9, 10 and 11). This chapter presents the interview data reporting participant perspectives and understandings informed by Māori culture, of key terms that may shape and inform perspectives and understandings of what is or is not environmental education (EE) or education for sustainability (EfS); the general topic of this research. Chapter 7

will then present data from participant interviews describing perceptions informed by Māori culture as articulated by the participants in this research of the relationships and inter-connections between people and the environment. Next, participant perceptions and understandings of EE and EfS are described in Chapter 8. Chapter 9 will investigate ways in which knowledge and skills equating to EE/EfS have been and are transferred within Māori culture, as articulated by participants in this research. An intrinsic Māori epistemology and pedagogy for EE/EfS emerges in Chapter 10.

A synopsis of an essentialised Māori cultural worldview has been presented in Section 4.3 of this thesis as a cultural reference, in order that participant responses throughout this thesis may be considered and understood in context. A glossary of key Māori terms that appear in this thesis is located at the front of this thesis, immediately following the list of tables. Explanation of cultural considerations and appropriate research approach and methods has been provided in the Statement of Limitations in Section 7 of Chapter 1 and in Section 9.2 of Chapter 5 of this thesis.

This chapter will first briefly describe the style in which the data of this study is presented before explaining the rationale for the line of questioning reported in this chapter, relating to participants' perceptions of key terms and concepts that inform the study topic. An overview of the qualitative research findings is then presented through an explanatory narrative, supported with participant statements, and illustrated with coded tables and keys. The data resulting from interviews is organised in the order that the questions were asked of participants and in which the interviews flowed, leading to the chapter's conclusion.

6.1.1 Presentation of the Data

The data arising from this research is reported in five separate chapters, each informing the other. This organisation allows the story of the development and content of the interview and results to unfold logically, incorporating developing themes and categories, leading to the research findings and conclusions.

The following section describes the rationale for this chapter's investigation of participant perceptions and understandings of key terms and concepts.

6.2 Key Terms and Concepts

As described in Chapter 2, different frames of reference influence the ways in which different people perceive the same phenomena or construct (Dunlap & Van Liere, 1978; Handel, 1982). Frames of reference or 'world views' and their effects and affects are discussed in detail in the literature review of this thesis (see Section 2.3). With this in mind, key terms and concepts that, independently and in combination, may shape or otherwise influence individual participant's understandings and perceptions of the constructs 'environmental education' and 'education for sustainability' were identified and examined, including the constructs themselves (addressed in Chapter 8).

During the course of their interview, participants were asked to explain their understanding of the terms and concepts 'the environment', 'education', 'learning', 'sustainability' and 'life-skills'. Data arising from responses related to these terms and concepts are presented in this chapter. The following sections present the data arising from analysis of participant interviews relating to the key terms and concepts that influence and shape perceptions of EE and EfS.

6.3 The Environment

Data describing participant understandings of the term 'the environment' have been coded and tabulated and presented in Table 11, below. This precedent will be followed in the sections and subsections of data chapters throughout this thesis. A synopsis of the main related themes will also head each section or subsection, as below.

The themes in this subsection illustrate that in perspectives informed by Māori culture as represented by participants in this research:

- the Western terms shaping the key constructs of this study do not have a direct translation or parallel concept;

- humans are inextricably inter-connected and inter-related with 'the environment' as te taiao[28] or te ao marama[29], including metaphysical and spiritual elements (wairua), such as atua and mana, by direct relationship through whakapapa (genealogy);

- the term 'the environment' is a Western construct which places humans outside and separate from natural things and related understandings;

- a distinction is made by many between the natural environment and the un-natural, human-induced 'developed' or built environment, yet it is understood that all comes from the universe through Papatūānuku.

Table 11: "What does the term 'the environment' mean to you, if anything?"

Participant	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14
'The Environment' is:		SU C WFR NE AE	SU C WFR NE AE WS	C WFR WC NE AE M	C WFR WC NE AE M WS	SU C WFR NE WS	WFR WC AE WS	SU C WFR WC AE M WS	C WFR NE AE M WS	SU C WFR NE WS	SU WFR AE WS	SU C WFR NE AE M WS	WFR WC AE WS	SU C WFR NE M
'The Environment' is not:	NR	SD UE	UE	SD UE	SD UE	UE	SD		UE	SD	SD	SD		UE

Key:

AE	All Encompassing/Holistic	C	Connected
M	Mauri / Metaphysical	NE	Natural Environment
NR	No Response	SD	Separate / Disconnected
SU	Sustains Us	UE	Un-natural Environment
WC	Western Construct	WFR	Whakapapa/Family/Relatedness
WS	Wairua / Spiritual		

Several participants (5/14) described 'the environment' in terms of it being:

> *. . . a pākehā construct about how pākehā relate to the environment, . . . [and] . . . in terms of a pākehā construct, 'the environment' is what surrounds you, rather than, as a Māori, what you are <u>related</u> to.*
>
> (Tui Shortland, her emphasis).

[28] All that is in the now
[29] The world of light – the natural world

Many participants (7/14) explained that from their various perspectives informed by Māori culture " . . . 'the environment' seems pretty clinical and detached when talking about the land and about the whenua and all that is" (Dr. Pip Pehi). "We speak of the environment as being te ao marama, the separation of the heavens and the earth to let that light in . . ." (Dr. Hauiti Hakopa) or as ". . . te taiao, which is all that is in the now" (Abraham Witana).

Several participants explained in their initial responses to this and subsequent questions that Western terms shaping the key constructs of this study, including 'the environment', 'education' and 'sustainability', do not have a direct translation or parallel concept in a Māori perspective. Some participants found responding to such constructs difficult. Significant efforts by some participants to make Western constructs fit their own worldview, informed by Māori culture, were apparent during their responses. In some cases it was clear that not only did some concepts not have a clear-cut translation, but they were nonsensical ideas in their holistic Māori worldview.

All but one participant (13/14) described 'the environment' as being connected to them by direct relationship through whakapapa (genealogy) and as family, explaining in various ways that everything living and non-living is perceived by them and by Māori in general, as a direct relative:

> *Māori see themselves as the youngest child of Papatūānuku and Ranginui, so that, when we look, whether they're insects, whether they're birds, whether they're trees, its one single family. We always see ourselves as the youngest child within a huge family, the offspring and children of Papatūānuku and Ranginui. So that's how that relationship IS. A whale, for example isn't just a whale – a whale is a tuakana, is a relative and that type of thing. And so that is what is really important from a Māori context about how we see the place of ourselves, the tāngata whenua or the Māori people, within our environment of Aotearoa.*
>
> (Matua[30] Hori Parata)

[30] 'Matua' is an honorific greeting for a male; 'Whaea' is the female equivalent

This observation is consistent with the literature, both in regard to descriptions of an essentialised Māori worldview, in specific (see such as Whangapirita et al., 2003) and to descriptions of holistic indigenous understandings and perspectives in general (see such as Agrawal, 1991, 2005; Hanbury-Tenison, 1991). The relationship between people and environment and its cultural significance from within an essentialised Māori worldview has been explained in Section 3 of Chapter 4 of this thesis.

In the interview data many participants (10/14) described " . . . a true connection with everything in the universe . . ." (Zack Makoare) to which:

> *. . . we are related, we are indivisible from what goes on around us: we are indivisible from the people, we're indivisible from the natural world, we're indivisible from what goes on in the spiritual world whether we believe in it or not, it will still affect us . . . we <u>are</u> the environment in which we find ourselves in.*
>
> (Dr. Pip Pehi)

Descriptions of the environment by most participants (10/14) were all-encompassing**,** including of other things in all aspects of life, at least in terms of respecting the mauri and mana of the life and tikanga around such, which might be taken appropriately for one's own sustenance or other use. For example:

> *Papatūānuku nurtures us and provides us with sustenance so that we may help nurture and give her sustenance and keep her well as kaitiaki. It's a reciprocal kind of thing*.
>
> (Rawinia Puna)

Several participants (5/14) spoke of the environment including metaphysical properties and psychological effects relating to hauora (health and well-being) and mauri, particularly in relation to the need to respect things around us, as we would wish for ourselves to be respected, for maintenance of our own well-being (Panelli & Tipa, 2007; Royal, 2007):

> *When I think about the environment I think about mauri and how, if we look after the mauri of everything, and I mean everything, then we should have a '<u>sustainable</u>' world.*
>
> (Dr. Hauiti Hakopa – his emphasis)

Many participants (9/14) described an understanding of 'the environment' in the context of the natural environment and conversely, strongly described it as not including the un-natural, human-induced 'developed' or built environment, which was held to relate to the disconnecting effect of the Western paradigm:

> *I'm talking about the natural environment, not the un-natural one. I'm not talking about the environment of a city, which today operates 24-7 with lights on all night. I'm talking about a life where light started in the morning and it went out in the evening and then it was dark. I'm talking about that kind of natural environment. Not the one that we have here today, where light's just blurring – all night, right up until the sun comes up and then those plastic lights go out . . .*
>
> (Matua Hori Parata)

Some participants made reference to the universe being the source of all. One participant explained an understanding and perspective that everything is natural in and comes from the Universe through Papatūānuku:

> *My car now and the rubber on it and the metal on it and the plastic on it – all of that came from the Earth. The petrol that runs it, the oil that's in the engine, all came from the Earth, so actually that is a manifestation of the environment.*
>
> (Dr. Pip Pehi)

6.4 Education

The themes in this subsection illustrate that in perspectives informed by Māori culture as represented by participants in this research:

- the term ‘education’ was not meaningful or readily engaged to describe the process of learning for life: ‘transfer of knowledge’ was;

- priorities of ‘education’ are the transfer of knowledge, values and skills’ that equip individuals for life and survival or ‘life-skills’;

- ‘life-skills’ strongly represent the qualities sought in mainstream EE and EfS literature and policy including: awareness, knowledge, understanding, attitude, values, skills and activities (see such as Ministry of Education, 1998, p. 10);

- Traditional approaches to facilitation emphasise experiential learning to imbue holistic attitudes, values and behaviours;

- learning occurs best when both facilitators and learners understand and engage with its purpose;

- Western perspectives of ‘education’ are not valued because they are not perceived to deliver life-skills.

Table 12: "What does the term 'education' mean to you, if anything?"

Participant	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14
Education Is . . .	I M A/T NB A K	I G KST NB L P C A K AT S V LS CO	I F M KST L P C A K AT S V BA	G F M L CTX P C SS A K U AT S V LS	G F M A/T KST CTX P C A K U AT S V CO	I G F P C A K AT V LS	 F M A/T KST TK P C A K U AT S V LS	G F M KST TK ATU L CTX P C A K U AT S V LS CO BA	G M A/T KST TK L P C A K U AT S V LS CO	I G F L CTX P C A K AT S V LS CO	I G M KST TK L CTX P A K U AT S V BA	I F M TK L CTX P C A K U AT S V LS CO	G F M A/T KST TK L P C A K U AT S V LS CO	I G F KST CTX P C A K U AT V LS CO
Education Is not . . .		 CC	NLS CC	WP NLS CC	WP NLS I IB	 I CC	WP CC	WP I CC IB	 NLS I	WP CC IB	WP CC		WP	 I CC

Key:

A	Awareness
AT	Attitude
BA	Being Articulate
CC	Curriculum / Controlled
CTX	Contextual
G	Guidance
IB	Institution Based
KST	Transfer of Knowledge/Skills
LS	Life-skills
NB	Nature Based
P	Practical
SS	Skills for Survival
U	Understanding
WP	Western Paradigm
A/T	Ako / Tutu / Trial and Error
ATU	To become Atua
C	Connection
CO	Conversation
F	Facilitation
I	Information
K	Knowledge
L	Learning & Skills for Learning
M	Mātauranga
NLS	Not Life Skills
S	Skills
TK	Traditional Knowledge
V	Values

Before describing their perspective of education and learning informed by Māori culture, most participants stated their position with regard to contemporary Western education in the context of their experiences in Aotearoa-New Zealand. While the focus of this section of this research is upon what participants' perspectives and understandings informed by Māori culture of 'education' are, it is useful for the purposes of this research to understand participants' perceptions of gaps in contemporary Western education.

Half of the participants (7/14) in this research did not readily engage with the Western term 'education':

> *To us, or to me, the word 'education' is purely a Western word. For me again*

it comes from a different dynamic or different way of how a certain grouping of people approach things

(Abraham Witana)

Several participants (7/14) suggested the contemporary Aotearoa-New Zealand education system " . . . generally speaking still takes a very contemporary Western, science focus . . ."(Linda Faulkner) which is " . . . a lot about someone standing up there . . . and telling us what's-what . . ." (Dr. Pip Pehi).

The participant interview data indicates that the purpose and outcomes of contemporary mainstream Western education is considered inadequate for equipping individuals with skills for living. For example:

In the Western paradigm today you learn how to 'do' something; you learn how to become 'something'. And then what they have to prove that you can do it is that they give you a certificate of some sort. It teaches you to be a lawyer and then that's all you're really any good for; it doesn't teach you to just be a person who has life-skills. To know how to be able to survive with integrity and continue.

(Matua Hori Parata)

Several participants' interview data described contemporary Western formal education as " . . . interfering with meaningful learning"[31] (T14). For example:

I don't see 'education' as going to school . . . the only thing that interferes with my learning is institutions, like schools and universities [in reference to Einstein (1879-1955), "the only thing that interferes with my learning is my education"]

(Dr. Hauiti Hakopa)

[31] It is noted as an observation relevant to the purposes of this research that participants' responses exhibit and relate high levels of awareness of connectedness, ecological and social literacy, and life-skills, as well as individual practical, academic competence and well-being, yet they include descriptions of a contemporary Western education system in Aotearoa-New Zealand that has not delivered those attributes for them or many of their people: whereas responses indicate that for participants, Mātauranga Māori has.

Many participants reframed the term 'education' to terms that sit more comfortably for them in their perspectives informed by Māori culture, in order to respond. 'Education' was described by many participants as 'mātauranga' and as being about learning and how to learn. Several participants described the process experienced by them or as being practiced by them, of informing and/or guiding and/or facilitating learning experiences, mostly with rangatahi (youth) or mokopuna (children), but also with other adults, as a 'transfer of knowledge':

> *When I was growing up it wasn't called 'education' or 'learning' at all to us. It was a 'transfer of knowledge' as opposed to a 'learning'.*
>
> (Abraham Witana)

A strong emphasis was placed by many participants (11/14) upon the purpose of 'education' being about " . . . equipping rangatahi (youth) with skills for survival . . ." (Zack Makoare) in any given or even foreseeable context (Abraham Witana). Many participants (6/14) described traditional knowledge, values and skills, and approaches to knowledge, including mātauranga and tikanga as the basis, form, purpose and content of the overall process of knowledge transfer and learning. For example:

> *. . . 'education' for Māori is 'mātauranga' – its knowledge, it's the maintenance of knowledge; the maintenance of mātauranga. 'Education' in Māori is where, at a very young age, you learn how to learn. And, it's through your life that you use that to learn whatever it is that you want to be doing at a particular time . . . how to survive.*
>
> (Matua Hori Parata)

Most participant interview data (9/14) described a " . . . transfer of knowledge . . . " (Abraham Witana) that is " . . . about equipping our young people with tools and skills for life and survival" (Matua Hori Parata). or ". . . life-skills" (T2).

The objectives of education from perspectives informed by Māori culture were described by a most participants in terms of being about:

> *. . . developing our children to what is in them; what they have in them and what they can be. It's about this multi-dynamic, multi-task, multi-dimensional, multi-spiritual time on this earth in growing into all those things. values, morals, communication, life-skills, spirituality, heightening all their senses they've been born with . . . [and] . . . relationships and connection and about patterns and about balance – seeing and knowing and understanding the connections and patterns around us that we are a part of, where we stand and the part we play.*
>
> (Rawinia Puna)

'Education' and learning were described by some participants (6/14) to be in part " . . . about the exchange of knowledge and information from generation to generation . . ." (Linda Faulkner) because, " . . . in the realms of kaitiakitanga today, it's really important to maintain the ability to practice the practices that were handed down to us by our ancestors, because everything that you do has some sort of connection along the way to an ancestor" (Matua Hori Parata).

Most participants stressed that (13/14) values and in particular respect is an important aspect of learning and 'being'. For example:

> *. . . respect of place, respect of Tangaroa and the ngahere, respect of others, respect of beliefs, respect of tikanga, respect of situations, of what is known and what is not known, but most of all respect of oneself as a part of all that."*
>
> (Zack Makoare)

All participants described 'education' in terms of individuals' actively developing awareness and knowledge of their own surroundings and of themselves. For example:

> *I think [education] must be in the entire process of understanding who you are, your relationship to everything around you too, but becoming aware of*

> *truly who you are in terms of your whakapapa links, in terms of your potential to 'be'. . . and to become Atua [by realising one's potential – Atuatanga].*
>
> (Dr. Hauiti Hakopa, his emphasis)

and:

> *. . . by aspiring to become the best of who one can possibly be, wise and humble, well and healthy, but tohungatanga (competent) at the basic things and the special things that are your gifts, and the kaumātua steering you to those places and people and doing stuff that bring that out . . . that person is valuable to the whanau, to the community, ne? That's how it used to be: a whole community – whole communities - of such people. And that's about mana.*
>
> (T14)

Several participants (9/14) described an experiential, life-long process of learning that " . . . might be formal and serious, like at a tangi and that, or wānanga, or doing fun stuff, gathering kai moana, or doing jobs of work, or playing around – that informal stuff . . ." (Zack Makoare). The participant interview data of several participants suggested that as a lifelong process:

> *. . . everything that you were part of or had happened to you along your way is part of that 'education' [indicating quotation marks] of making you who you are, right through your life.*
>
> (Abraham Witana)

A strong emphasis was placed by all participants for 'education' or learning needing to be, wherever possible, practical, meaningful and engaging because it is believed that "new generations only learn by practice" (Tahu Potiki). Effective 'education' was described by several participants as being best achieved through a process of 'tutu' or 'ako', as being based on a combination of watching, listening, emulating and trying things out, learning by trial and error:

> *For us as Māori, we have a different approach in how we learn things, I*

believe. As tupuna did in their days when there was something wrong with a person, it was all by trial and error, and that was the way to learn about something. A lay-man's term for education, to me and my whanau, is 'tutu', which is meaning to just go around and feel how things are within a certain field, . . . or terming it 'ako'. To 'ako'. And that's about learning.

(Abraham Witana, his emphasis)

Many participants (9/14) suggested from their perspective informed by Māori culture that education and " . . . learning is best if our young people know and understand the value of the skills and knowledge they're learning, and own it" (T2). For example:

. . . they learn best when they know what's going on and why they're doing it, and it's meaningful for them – especially if they think they're doing 'cool stuff'. Sometimes though [laugh], they learn best if they think they're doing 'cool stuff' and they forget they're doing work and think they aren't learning anything [laugh]! But at the end of the day, they look back and go 'goh – I can find those tuatua with my eyes closed and my hands behind my back, eh!' [laugh]. And they will never forget.

(Abraham Witana)

The nature, content, intention and form or approach of education were described by many participants (7/14) as being and/or needing to be dependent on circumstance, location and individual needs, and so contextual. For example:

So when I talk about koru Ruapehu to them, when I do it from Waikanae, it's pretty meaningless to them, but when we are actually up in Okakune and looking at the mountain and it's freezing cold or, even better if it's been snowing and there's snow sitting on the ground, it's much more meaningful for them, 'cos it's right there: they can see it, they can smell it, they can feel it.

(Linda Faulkner)

Most participants (9/14) described a meaningful 'curriculum' to be simple in that content should be driven through 'need' and " . . . shouldn't be dictated

from Wellington[32]" (Matua Hori Parata). 'Need' was described by some participants in terms such as:

. . . what is useful and has meaning for the needs of individuals and the community and so on, in relation to everyday life and what is needed to be well and happy and healthy 'now' and in the future, but reflecting the context of the community, the location, the setting, all those things - climate, situation; but having a clear understanding of what it is the learning is about and what it is for: what's its purpose? Getting rich as a whole lot of individuals? Or being well and happy as a community? Mātauranga Māori; that's about community: the people and the whenua. And the mauri and the wairua {laugh].

(Dr. Pip Pehi, her emphasis)

6.5 Learning

This section describes participants' perspectives with regard to the nature of learning in balance with their understanding of education and how education and learning are inter-related, to what effect.

The themes in this subsection illustrate that in perspectives informed by Māori culture as represented by participants in this research:

- the term 'learning' is understood in perspectives similar to mainstream Western perspectives;
- the objective of 'learning' is the acquisition of 'life-skills';
- learning and communication preferences for transfer of knowledge are visual, oral/aural and kinaesthetic (VAK) (Fleming & Mills, 1992);
- text literacy appears to be considered useful but not critical for effective learning to occur;

[32] Location of Aotearoa-New Zealand Parliament

- ‘success’ in learning is gauged in terms of well-being, happiness and mana stemming from the availability and security of food and healthy relationships.

In this section, learning is described as a central part of a process of building life-skills and knowledge of self, connections and relationships through experience, exposure to mātauranga and stories via visual, aural/oral, and practical methods. Learning appears to be understood in perspectives informed by Māori culture in terms compatible with mainstream Western perspectives; whereas ‘education’ was not (see 6.2.2). A measure of learning is described as being demonstrated in level of competence and level of skill, attitude and ability to cope, adapt, survive and continue.

Table 13: “What does the term ‘learning’ mean to you, if anything?”

Participant	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14
Learning is . . .	LS EX	V A K LS M KS EX	V A K LS INF EX	KN V A K LS M U ST MA KS EX	KN TK V A R K LS M ST KS EX	KN V A R K ST MA WP	TK V A K LS M ST KS P INC	KN TK V A R K LS M U ST KS EX WA	TK V A K LS M U ST EX P	KN TK V A K LS INF U EX P INC	V A K LS U ST EX P EM	KN TK V A K LS M ST MA KS EX P WA INC	LS EX	KN TK V A K LS INF M U ST EX P INC
Learning isn’t				WP R M	R		R	R	R		WP R			WP

Key:

A	Aural-oral	EM	Empowering
EX	Experience	INC	Incidental
INF	Information	K	Kinaesthetic
KN	Knowledge	KS	Kaumātua Source
LS	Life Skills	M	Mātauranga
MA	Māori Academic	P	Practical
PM	Pākehā understanding of Māori	R	Read-write
ST	Story Telling	TK	Transfer of Knowledge
U	Understanding	V	Visual
WA	Wānanga	WP	Western Paradigm

All participant interview data illustrates that the term ‘learning’ is understood in perspectives informed by Māori culture in similar terms to mainstream Western perspectives, such as it being “ . . . acquiring knowledge or skills or

abilities or awareness that we didn't have before . . ." (Dr. Pip Pehi); whereas 'education' was not (see 6.2.2).

Learning and education were seen and described by some participants as being the one and the same thing, consistent with expectations arising from the literature (e.g. Kochan, 2011).

A few participants' interview data identified a distinction between learning and education. For example:

> *Education's reasonably passive, in that it's the information available to learn or not, and the learning is actually up-taking that information and turning it into knowledge.*
>
> (Linda Faulkner)

Similar to responses in relation to education in the section above[33], most participants (13/14) described learning to be about accumulating and mastering " . . . life-skills through practical experiences" (T2).

Learning was described by most participants (12/14) in terms consistent with Fleming & Mills (1992) VAK / VARK; as being knowledge, its understanding and its transfer visually, orally and through the practical, kinaesthetic experience of these and 'doing it'[34]:

> *So that visual, audio and kinaesthetic thing, I think it's inherent in all Māori, and that's how we learn, and how we have that ability to get that transfer of*

[33] It should be noted here that instances of apparent repetition of themes in these and subsequent data are not in error or indicative of a weak thesis, but rather an illustration of the inter-connected, inter-related and inter-dependent nature of most if not all of the data in this research. It is theorised as part of this research that such may be a feature of data arising from research of a holistic worldview.

[34] It is noted as a pedagogical observation relevant to the purposes of this research that the practical and aural/oral dimensions of responses highlight the importance of identifying and addressing learning preferences in effective education programmes

knowledge across for us or how we know it today as 'learning'.

(Abraham Witana)

References to educational theory and practices were made in several instances similar to the example above, indicating opinions by education and learning theory. Reading and 'riting – the 'R' in the acronym VARK - while being seen as useful if not important for functioning in the context of a pākehā/Westernised contemporary world, were not described as being a priority or even important for effective learning to occur within perspectives informed by Māori culture:

. . . education wasn't about writing and arithmetic, it was about learning what's in your environment – or what's within the whanau, the hapu and within the iwi sense.

(Abraham Witana)

Participant responses to this question reinforced the observations made in the previous section relating to 'education' and the apparent omissions of the contemporary education curriculum and teaching pedagogical practices in Aotearoa-New Zealand with regard to addressing VAK learning preferences.

The interview data of several participants suggests a perspective informed by Māori culture that 'success' is " . . . not about certificates and qualifications, or a flash job and how much [money] you make, or what [material possessions] you've got . . ." (Matua Hori Parata).

The participant interview data of several participants described 'success' " . . . is about mana . . ." (Dr. Hauiti Hakopa), " . . . comfort and health . . . (Chris Holtham), " . . . well-being and happiness . . ." (Dr. Pip Pehi) stemming from " . . . availability and security of food and healthy relationships" (T2).

Pākehā judge when our mokopuna and rangatahi are ready or 'qualified' by them giving 'the right answer': the one the system wants. We judge readiness by them asking the right question: and that is a different thing altogether.

(Te Moengarau Hemopo)

Such is consistent with the literature (e.g. Royal, 2007).

A core life-skill particularly pertinent to learning was described by several participants as "learning how to learn" (Dr. Hauiti Hakopa; Matua Hori Parata; Te Moengarau Hemopo) and valuing awareness and knowledge rather than the western idea of 'education':

> *I think you need to be learned, I really do. Otherwise we become poor caretakers of knowledge if we are not learned. So we need to learn about the value of knowledge – not the value of 'education', the value of knowledge; and we need to learn about the value of how that knowledge can be disseminated too. So our knowledge and the way we disseminate that knowledge should form part of everything that we do. Learning is important.*
>
> (Dr. Hauiti Hakopa)

The importance of storytelling is a recurring theme throughout the data and chapters of this thesis, as is the importance of whakapapa and a number of other interwoven themes. Stories and storytelling have long been acknowledged in the literature as very effective methods of transferring information for long term retention and recall within memory (Gasbarri, 2005; McGuigan & Salmon, 2006). Many participants interview data (9/14) described stories relating to mātauranga and skills for living being shared and enjoyed in a meaningful context with a particular iwi, incorporating whakapapa to illustrate and reinforce relatedness, applicability and connections amongst the communities and within the landscape.

> *There was always a story. It wasn't just for the stories sake, it's always they have a purpose and there's always a lesson learnt from what we're learning. There's not only a lesson learned, there's a whakapapa as well.*
>
> (Tui Shortland)

6.6 Sustainability

The themes in this subsection illustrate that in perspectives informed by Māori culture as represented by participants in this research:

- the term 'sustainability' is a Western construct without meaning or equivalent in a Māori worldview;

- contemporary applications of the term 'sustainability' is about growth and development and not about ensuring society's ability to maintain ecological balance;

- ecological sustainability is a way of thinking and a way of <u>being</u>, and a part of being tāngata whenua as Māori;

Table 14: "What does the term 'sustainability' mean to you, if anything?"

Participant	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14
'Sustainability' is	C	NC P CX	T AW AW B	N P EC	NC WC MT EC T CX	MT AW B	N WC MT	NC WC MT	P WC EC CX	P WC T AW B	WC MT	WC T AW B	P WC EC	N WC MT AW B

<u>Key</u>:

AW	A Way of Thinking	AWB	A Way of Being
C	Circumstance not Philosophy	CX	Contextual
EC	Economic Construct	N	Nonsense
MT	Modern Term	NC	No such Construct
P	Problematic Term	WC	Western Construct
T	Tikanga		

Most participants (9/14) immediately and emphatically described the term 'sustainability' as " . . . a modern pākehā word . . ." (Tui Shortland) or Western construct without meaning or equivalent in a Māori worldview. For example:

> *For us as a Māori there was never a term based on sustainability or the use of the word sustainability never existed within our language, because we always ensured that our tikanga o te taiao, tikanga o te moana, tikanga o te ngahere,*

> *were always followed. And that was a tool, or **the** tool that was used to manage the people in accessing the resource to ensure that the particular resource was there for evermore. It's only been in the past 50 years maybe where the term sustainability has come into being because of the Western world's approach in getting access to all of these resources that we as Māori knew had a limit.*
>
> (Abraham Witana)

Several participants (3/14) described the application of the term 'sustainability' in Western environmental education, policy and management as being " . . . just a nonsense" (Matua Hori Parata).

Many participants (10/14) described perceptions of 'sustainability' being about economic and business applications, growth and development, and not about ensuring society's ability to maintain ecological balance. For example

> *. . . 'go, go, go' to maximise development, production, consumption and returns before we <u>have</u> to stop because there's nothing left and there is no other alternative.*
>
> (T14, original emphasis)

Several participants (5/14) suggested that " . . . the ecological thing of this sustainability is a way of thinking and a way of <u>being</u>, and a part of being tāngata whenua as Māori" (Rawinia Puna). For example:

> *It's something we've always done, but somebody's gone and put a label on it. It means saving for tomorrow. Saving for my moko's moko. Doing something today so that my moko has an opportunity to do something that I did, so they can work the same land that their nanny worked in . . .*
>
> (Hinewai Ngatai)

and:

> *For us as Māori, we only extracted what we need for a feed, to ensure that we were kept healthy over a period of time.*

(Abraham Witana)

While most participants (13/14) suggested that the old ways made sense in context of conditions of the times and would continue to do so if applied in the modern context, one clear opinion was that the idea that the goal of sustainability drove traditional practice is a myth:

> *. . . the practices of the past, that led to sustainable-type outcomes, were a product of circumstance and not philosophy. A small population and access to abundant natural resources meant that it was remarkably difficult to overhunt - the moa being the obvious exception but I imagine there was a breeding cycle issue they had not encountered before (similar to the Orange Roughy fishery). Hunting and gathering outside of season was not sensible and entirely unfruitful as opposed to discouraged or planned due to a systems theory of some sort.*
>
> (Tahu Potiki)

and:

> *Māori society never encountered an environmental tipping point where they were confronted with the need for sustainable philosophies. Their waste management practices, water and sanitation practices, religious concepts as applied to natural resources all often ran counter to modern ideas about sustainability.*
>
> (Tahu Potiki)

Tahu Potiki suggested specifically with regard to 'sustainability', within his response to interview questions relating to education for sustainability, that "marrying Māori philosophy to modern environment sustainability policies has found a lot of favour but is quite flawed"[35]. This position contrasts with a tempered theme both within other participant responses and within the

[35] While 'sustainability' and sustainability policy are not the focus of this research, this contrasting perspective – so strongly stated within the data – warranted further scrutiny. Because there was no further detail within the original interview data, the participant was appropriately re-approached by email and asked if he would mind explaining further. The partitipant was clear in his communication that he had nothing further to offer at that time, or at a later similar enquiry. I felt it not tika (appropriate) to pursue him further, and felt further scrutiny of the topic inappropriate without Tahu Potiki's further explanation, and chose to stress the point and leave it for others to pick up on or follow up myself in another research.

literature, that suggests it is not the traditional ways of old themselves that are lacking in human interactions within the environment, but an awareness, knowledge and understanding of inter-connections and inter-relationships that form a basis for an environmental ethic that will allow sufficient shifts in attitude and practices and our long term continuance (Agrawal, 1991; Aronson et al., 2010; Gough, 1990; Mehrotra, 2006; Orr, 1990; Turner, 2005).

6.7 Life-skills

The themes in this subsection illustrate that in perspectives informed by Māori culture as represented by participants in this research:

- life-skills are a combination of awareness, knowledge and understanding of relationships and connections that support the development of attitudes, values and relevant practical ability, critical qualities and skills for survival and community life;

- Key critical qualities include environmental sensitivity, literacy and ability to contextualise and adapt, as well as spiritual connection.

Table 15: "What does the term 'life-skills' mean to you, if anything?"

Participant	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14
Life-skills are:	NR	R RE P SS A K U C AV S ES EC EL I	R SS A C ES EL I	R RE P SS A K U C AV S ES EC EL I KMP	R P SS A K U C AV S ES EC EL I KMP	R ES EL I	R SS A K U C AV S ES EC EL	R RE P A K U C AV S ES EC EL I KMP	R RE P SS A K U C AV S EL I	R RE P SS A K U C AV S EC EL I KMP	R RE P SS A C I	R P SS A K U C AV S ES EC EL I KMP	R SS C ES KMP	R P SS A K U C AV S EL I KMP

Key:

A	Awareness	AV	Attitude & Values
C	Connection	EC	Environmental Contextualisation
EL	Environmental Literacy	ES	Environmental Sensitisation
I	Important	K	Knowledge
KMP	Karakia, Meditation, Prayer	NR	No Response
P	Practical	R	Relationships
RE	Relevance	S	Skills
SS	Survival Skills	U	Understanding

Most participants in this research described life-skills as practical (9/14) and basic to individual and community survival and well-being (13/14). Life-skills were described to include " . . . just knowing what it is to be alive, what is needed to stay alive and healthy, knowing your own abilities and limitations, and how to apply them" (T14).

Many participants (11/14) described life-skills as being " . . . very important" (Matua Hori Parata).

Most participants (11/14) described life-skills in terms such as ". . . gathering food, general cooking, farming, harvesting, being able to work, [and] being able to contribute to the community . . ." (T2) and " . . . equipping rangatahi (youth) with skills for survival . . ." (Zack Makoare) in any given or even foreseeable context (Abraham Witana).

Several participants (6/14) suggested that what is or is not an applicable life-skill or set of life-skill depends on context. For example:

> *Are you in an urban city? Then your life-skills will need to be different. Are you living in an abusive relationship? Your life-skills need to be different. Are you living in a privileged lifestyle where you have education, you have everything that you need and could possibly want? Your life-skills are different.*
>
> (Dr. Pip Pehi)

Many participants (7/14) described awareness and understanding of self and of the particular environment one is in (environmental contextualisation) as being integral to an individual having adequate and effective life-skills:

> *Life-skills is about understanding not only yourself, but also how you actually fit into the environment that you are dealing with at a particular time.*
>
> (Matua Hori Parata)

Some participants (9/14) considered that a key component of life-skills is awareness and sensitivity to the environment and environmental elements, such as descriptions equating to the construct in the literature of 'environmental sensitivity' (see such as Orr, 1990). For example:

> *Utilising your senses, heightening your senses, y'know: sense of smell, taste, hearing, all those things should be in tune, and always. Because our next generation coming along is being well and truly removed from all of those senses that we've been born with.*
>
> (Rawinia Puna)

and:

> *. . . when we listen, we're not listening to what the Kaumātua and Kuia are saying; we are actually being taught to listen to the sound of the environment: to the wind, whether or not you believe it or not, to the sun – the rays of the sun, to the rain drops, to the sound of rivers, and to the sound of the sea itself for . . . Just to give an example, because I live in a place called Pungaru, we're kind of inland from the coast, and one of the sounds for us when the coast was rough was hearing the sound of the sea in our rivers. If we could hear the sound of the sea in our rivers, that was telling us that its' no good going out fishing or it's no good going out to collect kai moana, or those type of things. So that was a learning type of tikanga for us.*
>
> (Abraham Witana)

Almost all participants (13/14) identified understanding and embodying inter-relationship and inter-connectedness with all that is through whakapapa as a core life-skill. The following example explains this essential understanding:

> *When we call it 'ngahere', it's more than just a sound; it is also a very powerful meaning that all of those things within the forest like, when we talk about the forest it's not only about the trees; it's about the birds, it's about the insects, it's about all of the different biota that makes up that forests, and that's what the word 'ngahere' means is, it's like the connecting, the, joining*

> *of all of those things into a single ecosystem. So that is how we look at the environment is that when we think about the forest we don't only think about trees, we think about insects, we think about plants, we think about birds and the bees. And so that's what part of life-skill is about in terms of, of looking at the environment from a Māori context is we <u>have</u> to understand it like that.*
>
> (Matua Hori Parata, his emphasis)

In this vein, concern was expressed about the nature of technology, high pressure lives and other distractions or 'static' of the western lifestyle and society leading to peoples' " . . . disconnection from themselves; from their own thoughts and feelings and senses . . ." (Linda Faulkner), as well as " . . . from te taiao" (Abraham Witana):

> *The TV and cell phone and games and technology that's coming – everything's at your finger-tips, sort of thing; it's detracting you away from listening to the sound of the birds, watching how they interact, the environment, y'know, feeling that breeze against your skin, and knowing there's a change on, smelling the rain coming and at the same time tasting that goodness of food you planted, from your garden. We're getting moved further away from utilising our own senses.*
>
> (Rawinia Puna)

These observations are consistent with concerns expressed in the literature (Winn, 1977, 1988).

A stand-out observation amongst several similarly insightful comments in participant interview data relating to the status quo and the state of wellness of people and environment, not evident in the literature, was:

> *There has been no decrease in connection; there has been a decrease in <u>awareness</u> of connection.*
>
> (Dr. Pip Pehi – her emphasis)

Several participants (11/14) described awareness, environmental sensitivity and understanding being necessary for knowledge of the environment to

follow, and this as being an important life-skill. Such responses are in terms of environmental literacy as described in the literature (Hansbury-Tenison, 1991; Orr, 1990 & 1992; Roth, 1992):

> *As we were growing up, then we could tell which birds are where and which direction. And it all just came naturally. And it still does. Like in the bush, if I go into ngahere now, just as long as I have a visual of where the sun is, I can find my way out – never to get lost.*
>
> (Abraham Witana)

Several participants (7/14) described meditation, prayer and karakia as being important life-skills in various ways. For example:

> *For me the karakia is not about a ritual that needs to be done in a certain way. Karakia for me, for my kai and for my inner is to say 'thank you' and to have gratitude for being provided for with sustenance. But more than that, so say I'm eating fish, it's to recognise the moana that fed the fish, it's to recognise the person that caught the fish if it wasn't me, it's to recognise the fish for giving up its life for me to eat it, it's the sunshine that grows the food and then, eventually it's thanking everything.*
>
> (Dr. Pip Pehi)

Fears were expressed for the direction of humanity's interactions with Papatūānuku and course on the Earth, by most participants in and around their responses in relation to life-skills. Several participants described developing economic, social, ecological and energy crises as being signs of "not-so-good-things to come" (Rawinia Puna) and being symptomatic of an escalating local and global environmental crisis. Observations were made of conclusions for predictable paths of "messing with nature" (T2) and "creating an imbalance in defiance of the laws of nature and the universe" (Dr. Hauiti Hakopa), were common amongst responses and dialogue. These references tended to be descriptive in or reminiscent of terms of Allen's (1970) 'Education for Survival'. For example:

If we're talking in terms of education for the future . . . I don't think there's a time too far ahead in the future where the way that we are choosing to live will no longer be possible and we will have to be closer to the environment, to the physical world, to the natural world. And therefore our life-skills will be hugely different. When it all goes to custard I think [the people] everybody will want to know are the ones who know how to get kai. You know, the hunters and the people that are connected to the environment. Unfortunately, the people that have land, but people who know how to grow food. And initially, sadly, people who have guns, because I think it'll be a bit messy.

(Dr. Pip Pehi, her emphasis)

6.8 Chapter Discussion

Because some of the key terms informing this research appear effectively 'alien' within participants' holistic Māori worldview, it is likely that the composite constructs 'environmental education' and 'education for sustainability' will similarly have no translation or at least be understood in a very different way (if at all) from mainstream Western perspectives. Results of this research so far highlight that generic understandings of such terms and constructs cannot be assumed. Ways in which key terms, concepts and constructs are perceived and understood from within holistic worldviews of participants have potential to inform the purposes of this research. Therefore this research now needs to investigate, identify and understand how the composite constructs 'environmental education' and 'education for sustainability' are perceived and understood by participants. The data resulting from analysis towards such investigation will be presented in Chapter 8.

The indications within the data of the key purposes of Māori 'education' and learning and the key objectives of mainstream Western EE or EfS effectively being the same, are very significant to the purposes of this research. Consideration of this observation has led this research to theorise the possibility that an adaptable and/or adoptable framework for a holistic epistemology and/or pedagogy may already exist embedded within Māori cultural understandings and practices. This theory will be revisited and

considered in balance with the findings of Chapter 9, in Chapter 10 and again in the discussion chapter, Chapter 11, of this thesis.

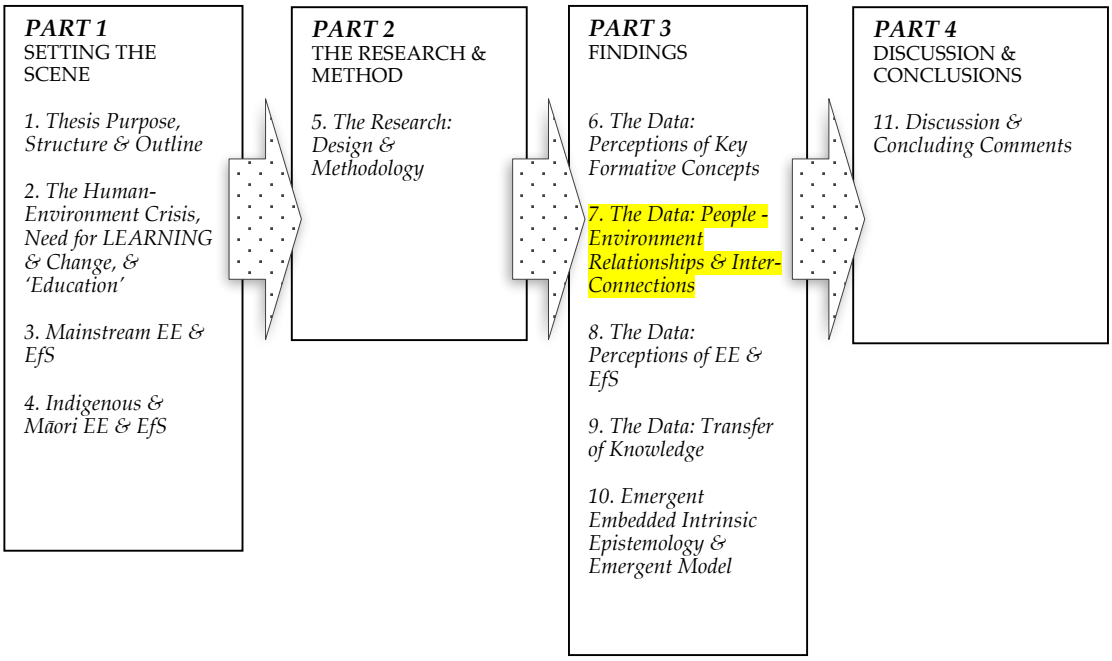
An underpinning theme throughout the data of this chapter of inter-relatedness and inter-connectedness between people and 'the environment' suggests a need for this research to investigate and analyse participants' perceptions of these relationships and connections in balance with the literature, in order to ground the analysis and understanding of the data arising from composite terms key to this research.

6.9 Chapter Conclusion

This chapter has investigated participant perspectives and understandings of key terms that may shape and inform perspectives and understandings of what is or is not 'environmental education' or 'education for sustainability'. Core understandings have been identified, theory developed and areas for needing further investigation and clarification to test this theory as part of this research have been clarified.

The following chapter will present the data and findings relating to participant descriptions of their perceptions of inter-relationships and inter-connections between people and the environment.

7.0 THE DATA: People – Environment Inter-Connections and Relationships:



7.1 Introduction

The previous chapter of this thesis (Chapter 6) described participant perspectives and understandings of key terms that shape and inform their perspectives and understandings of what is or is not EE or EfS. Amongst results reported in Chapter 6 a common understanding and perception of human-environment interdependence, inter-connection and direct relationship informed by Māori culture was identified amongst participants. The purpose of this chapter is to provide a more detailed understanding of perspectives and understandings informed by Māori culture of the connections and relationships between people and the environment.

The literature strongly argues that closing such gaps in fundamental understandings of human-environment connection and relationships is key to achieving a paradigm shift (Sterling, 2001; Suzuki et al., 2007). The overall purpose of this research is to identify ways in which understandings and approaches informed by Māori culture might help address epistemological

and pedagogical gaps in mainstream environmental education and education for sustainability. Despite best intentions, ways of bridging may not be apparent from reappraisal of existing frameworks and assumptions within mainstream Western perspectives. A more detailed understanding of participant perspectives and understandings of human-environment inter-connections and relationships is useful towards the purpose of this research in two ways. Firstly, by clarifying ways in which perspectives of human-environment relationships, and connections and inter-dependencies informed by Māori culture, differ from those informed by mainstream Western EE/EfS (such as Fien & Gough, 1996; Ministry for the Environment, 1998; Ministry of Education 1999b). Secondly, by perhaps helping identify ways of bridging the gaps of human-environment detachment and disconnection from the total environment (Scott, 1984), described in the literature as symptomatic of mainstream technocentric Western perspectives (see Brian, 2007; Hart, 2010; Kessler, 1999; Miller, 1996; Oats, 2001).

This chapter will present the results of a detailed analysis of perspectives and understandings informed by Māori culture of the connections and relationships between people and the environment. Results of this chapter provide insight into perspectives informed by Māori culture and help inform the key purpose of this research. The results of this analysis are consistent with and extend upon results presented in Chapter 6 of this thesis.

The first section of this chapter will describe participants' perspectives on human-environmental relatedness and the dynamics of that relationship.

7.2 Relationship between People and Environment

The key themes in this section describe perspectives informed by Māori culture of family relatedness with and community relationship between tāngata whenua and 'the environment' as Te Taiao (including the living Earth as Papatūānuku, the skies as Ranginui, and all the entities that are also their children), with which tāngata whenua communicate and interact directly, seeking to reciprocate towards mutual well-being and sustenance through balance.

Table 16: "What is the relationship between people and the environment?"

Participant	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14
Relationship between People and Environment	NR	WFR SA SW RE	WFR RR N SW RE LE	WFR RR SA LE	WFR RR SA N CDI RE LE	WFR RR SW CDI LE	WFR RR SW	WFR RR SA N SW CDI RE LE	WFR RE	WFR RR SA SW CDI LE	WFR RR N SW RE LE	WFR RR SA N CDI RE LE	WFR RR SA N SW CDI RE LE	WFR RR SA SW RE LE

Key:

CDI	Communication/Dialogue/Interaction	LE	Living Earth/Atua
N	Nurturing	NR	No Response
RE	Respect	RR	Reciprocal Relationship
SA	Safety	SW	Sustenance & Welfare of Each Other
S/W	Spiritual / Wairua	WFR	Whakapapa/Family Relatedness

Responses were very clear amongst participants on matters of perspective and were similarly articulated within a range of aspects within those perspectives. All but one participant clearly described an understanding of the relationship between people and environment through the connectedness of family by way of whakapapa. For example:

> *we always see ourselves as the youngest child, within a huge family, the off-spring and children of Papatūānuku and Ranginui. That's how that relationship IS.*
>
> (Matua Hori Parata)

'Whakapapa or family relatedness' describes the first theme. As characteristic of this theme, many participants described the relationship and connection between people and the environment as being direct and inextricable. For example:

> *. . . the river doesn't just exist in our rohe, but actually it's literally part of who we are. Hence the proverb 'I am the river and the river is me'.*
>
> (Linda Faulkner)

A common distinction was made, with comment and whakatauki (proverbs), in regard to relationship and the Western concept of 'ownership' of the land

and natural resources, clarifying from a Māori perspective that tāngata whenua do not and cannot own the land because:

> *We belong to - we are of - the land and the river and the mountain; not vice versa.*
>
> (Te Moengarau Hemopo, her emphasis)

The capacity and theme of 'respect' was emphasised in most responses (9/14) and was reflected in the formal and deferent nature of all korero. A majority of participants (11/14) explained a reciprocal relationship in which ". . . we as kaitiaki respect and look after the entities and people around us, who at the same time look after us" (Tui Shortland). An example that concurrently illustrates the theme of 'sustenance and welfare of each other' is:

> *Papatūānuku can help sustain my well-being on this earth. I feel it's reciprocal. If she's giving me the life force of food to sustain my body, the least I can do is return the favour by respecting her unconditional sort of act of giving to us, to have us to be able to sustain living on this earth. I am Papatūānuku and Papatūānuku is me.*
>
> (Rawinia Puna)

The theme of respect was reflected in most participants' (10/14) ontological references to all aspects of relationship with 'the environment' as a living community through references to cultural concepts including most, if not all, things possessing mauri, mana and wairua, and the need to " . . . ensure our integrity in all our actions and interactions" (Te Moengarau Hemopo):

> *He mana tote he mana totena. Everything's got mana in Māori, even rocks. It might be a lower form, but it's still got something in there. If we look after the mauri of everything, and I mean everything, then we should have a sustainable world. One thing that's for sure is we need to protect the mauri of*

the land and everything to do with land; otherwise we are not going to survive.

(Dr. Hauiti Hakopa)

In relation to the theme of 'respect', reference to disrespect of the environment was made by several participants in regard to some perspectives, developments and/or practices observed of mainstream Western governance and management stemming from scientific and commercial Western worldviews. Such data perhaps highlight disparities between mātauranga Māori and Western science, as well as gaps in policy and bureaucratic process, in such as:

The manuhiri that we have running our country, who don't even understand how they and these things are connected, but make up all of these rules that, like 'sustainability' is just plain nonsense. Not only ourselves as Māori, but even Pākehā managers like our councils have never done full biological and archaeological audits, which are very significant. You cannot apply 'sustainable resource management' to something that you don't know what you got.

(Matua Hori Parata)

Several participants made similarly strong points regarding what they perceived as pākehā or Western bias and marginalisation of Māori cultural beliefs and values in government policy and agency in Aotearoa-New Zealand. Hart (2010, p. 4) has described such bias effecting indigenous worldviews as being 'Eurocentric'. These participant concerns have significant bearing upon how perceptions and understandings informed by Māori culture of the themes 'communication/dialogue/interaction' and 'spirituality/wairua' might be analysed from perspectives informed by Eurocentric perspectives[36]. Te Moengarau Hemopo explained, for example:

[36] In this thesis I am using the term 'Eurocentric' in the way that Hart (2010) uses it, as viewing the world from a European-centred or mainstream Western perspective.

Wairua is something that you know's there, you can see it, but you can't touch it . . . [but] . . . in the Western society they can't grab that connection between atua or that intrinsic side and your tinana. They can't grab it.

Tui Shortland suggested:

I think we haven't really thought enough about the importance of focusing on traditional knowledge. I think over the years, Western science has suffocated mātauranga Māori. And I think that mātauranga Māori has ways and understanding that Western science cannot provide. If people would just give it the acknowledgement and give it the chance to develop into a new context that we have today to address the new problems that is the picture. We'll less look at a Western science framework that is hierarchical, sort of 'imposed upon' traditional knowledge, and picks apart everything into little bits away from the whole. It is my hope that everybody turns to mātauranga Māori in terms of holistic, looking at everything, looking at how learning and traditions over the years have developed traditional knowledge for us today.

In this vein, several participants observed and expressed concern that the combined effects of colonisation and modernisation have led to a growing loss of such cultural knowledge and skills as " . . . the comfort and the ability to . . . have a conversation with the trees and birds and the river" (Linda Faulkner). This capacity relates to the theme of 'communication/dialogue/interaction'. Almost half of the participants (6/14) made reference to themselves or being in the presence of others, directly communicating with environmental entities as a matter of fact and everyday behaviour. For example:

The environment will talk to me or the animals will talk to me and they'll let me know what's going on, or they'll give me messages.

(Dr. Pip Pehi)

and:

He was standing there talking to the birds, like literally actually speaking with them and they were speaking back to him.

(Linda Faulkner)

Many participants (8/14) described experiencing a sense of safety (or at times non-safety) in different environmental settings. All of these descriptions were of an intuitive or spiritual/wairua nature in terms of sense of place, but were distinct in terms of a theme concerning 'safety':

We go to land and we find places that are, that feel good. And by 'feel good', I mean you actually feel the connection with the land, like you feel a warmth and . . . . it almost feels safe when you're there. And then you'll come into an area sometimes that doesn't feel safe; its cold, it's, it has, is unpleasant and it's, I thinks it's almost like a seventh sense that we have as people of the land and as tāngata whenua.

(T2, original emphasis)

Some descriptions such as the above suggest an awareness of sensitivity to an aspect of the environment, but perhaps a lack of ability to 'read' or fully interpret and understand what it is they are sensing beyond the instinct of being safe or not so. This is further described in the next section of this chapter addressing connectedness. While some participants made few direct references to the topic and theme of 'spirituality/wairua', such as T2 in the example regarding 'feeling safe' above, most participants (9/14) freely described spiritual and wairua aspects of their understanding of human-environment connections and relationships. For example:

Big taniwha, bro', big taniwha she reckoned, One come from the southern end one come from the northern end, they came up, they raised their heads up, they snorted and they went back out. Now I can't see things like that, it's not my gift; but she can eh? So I think we need to perform those type of rituals so those kinds of things would make themselves manifest to us. Because they exist. We call them the kaitiaki. So they are obviously looking after the oceans, those part of the oceans as well, eh?

(Dr. Hauiti Hakopa)

Such understandings appear common within the literature describing indigenous cultures (see such as Cajete, 1999; Davis, 2008; Hart, 2010; Royal, 2010). Because these spiritual/wairua aspects were more strongly identified in reference to connectedness, incidence of spiritual/wairua data has been indicated in Table 17 in the following section.

The following section will describe participants' perspectives of human-environmental connectedness in terms of the scale of perceived affinity, attachment and/or dependence.

7.3 Peoples' Connectedness with the Environment

The themes in this section describe and illustrate perceptions of inextricable inter-connectedness of people with all elements and dimensions that comprise the total environment (Scott, 1984), and qualities of sensitivity, awareness, and literacy if not competence to those dimensions as representative of perceptions informed by Māori culture.

Table 17: Connectedness: "What is the relationship between people and the environment?"

Participant	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14
Connection (Home and environment al behaviour)	NR	C CE S S/W	C CE S S/W	C CI CC S/W	C CE CI S S/W	C CI S S/W	C S S/W	C CE CI CC S S/W	C CE CC S/W	C CI CC S S/W	C CC S/W	C CE CI S	C CE CI CC S S/W	C CE CI CC S S/W

Key:

C	Connection overall	CC	Connection with Community
CE	Connection with Environment	CI	Connection with Inwards/Self
NR	No Response	S	Sensitisation
S/W	Spiritual / Wairua		

The dominant theme in this section was of 'connection overall'. All but one participant described their understanding of being inextricably connected and inter-related with their surroundings:

> *Amongst the whanau in that hapu environment [the world we are in today] is called 'Te Taiao', and we as human beings are part of that – we're not*

separated. We don't separate ourselves from the environment. We're just a small part, or small player, within that environment; we're an important part, but we shouldn't be seeing ourselves as human beings at the top of the food chain.

(Abraham Witana)

Such overall connection appears to underpin Māori culture:

We connect to the Earth in the way we do things. You know, the places we visit and the way we bury our dead and the way that we talk about the land and the stories that it records for us.

(Dr. Hauiti Hakopa)

These results are consistent with the literature describing commonalities of indigenous worldviews, which are explained by McKenzie and Morissette (2003) in Hart (2010, p. 2) to emerge as a result of indigenous people's close relationship with the environment.

Most participants (10/14) described development of the senses and fine-tuned sensitivity, particularly to conditions and changes in familiar environments. In this theme of 'sensitivity', participants described an awareness of sensitivities and skill that can be practiced and honed, so that an individual becomes aware of their sensitivities and abilities to interpret environmental elements, conditions, variables and indicators. For example:

The relationship and connection is inherent in all Māori. Some of us have more of a connection to it [than others] because we can see more and we can actually hear what's going on with Papatūānuku or within Te Taiao itself.

(Abraham Witana)

Dr. Pip Pehi explained that once aware, people are able to become increasingly sensitive through guidance and practice, and literate of the meanings in terms of what is happening, what is about to happen, and what needs to be done or what has occurred where, when, how and why. It was explained that (expanding on an earlier quotation):

> *. . . when we listen, we're not listening to . . . the sound of 'the environment, we're listening to te taiao: to the wind, whether or not you believe it or not, to the sun – the rays of the sun, to the rain drops, to the sound of rivers, and to the sound of the sea itself for . . . Just to give an example, because I live in a place called Pungaru, we're kind of inland from the coast, and one of the sounds for us when the coast was rough was hearing the sound of the sea in our rivers. If we could hear the sound of the sea in our rivers, that was telling us that its' no good going out fishing or it's no good going out to collect kai moana, or those type of things. So that was a learning type of tikanga for us.*
>
> (Abraham Witana)

Orr (1992) describes such sensitivity, awareness and ability to interpret as environmental sensitisation and environmental literacy. As is described in Chapter 2 of this thesis these are key qualities advocated in the literature (such as Bellamy & Quayle, 1986; M.o.E., 1999; M.f.E., 1998; M.f.E., 2006; Roth, 1992; UNESCO, 1993) and sought in environmental education and education for sustainability theory (such as Agyeman, 2002; Chawla, 1998; EnviroSchools Foundation, 2008).

It was explained in various ways by most participants (13/14) that because the people are part of an inter-connected and inter-related whole, everything done by people affects another part of the whole, enriching or sickening connections with the land. Te Moengarau Hemopo explained that " . . . with knowledge of this, every action requires careful consideration and appropriate [protocol]". Dr. Hauiti Hakopa extends from this:

> *So we live, we die and in between we breath. (Ha) and we do everything and everything we do is about our relationship, not just with each other with the whakapapa stuff and you know, up there and this way and down to the Earth as well too. So it's everything that we do creates a connection or a disconnection to the land. We do karakia so that we can be mindful of where they come from and where they will eventually go to. So if you've ever heard of that saying "tui tu te whenua" – they gonna be around a lot longer than you and I are gonna be around, eh? We're just gonna be compost (laugh)*

> *eventually, regardless of the fact that we are gonna live for a long, long time in wairua. . You know wairua stuff eh? The earth's gonna be around a long time. And I think the earth has wairua too.*
>
> (Dr. Hauiti Hakopa)

A clear theme in the data was of 'connection with environment'. It should be noted that, as described in results of the previous chapter, most participants appeared to labour over engaging with the term 'the environment', perhaps out of respect for the researcher and the interview question. The term 'the environment' did not appear to sit comfortably with most participants, so it tended to be emphasised in their korero. Some participants used fingers to visually indicate quotation marks or inverted commas, such as ". . . we're not listening to . . . the sound of 'the environment', we're listening to te taiao . . ." (Abraham Witana, see above). It was apparent through participant responses that people's connection with the environment as a part of the environment was assumed as being a given knowledge and actuality as part of their cultural conceptions of te taiao, and surprise was evident in many responses that such should be questioned or could be thought otherwise. Many participants (8/14) described connectedness outwardly with the environment holistically and to elements and specific components through whakapapa as a matter of fact. For example:

> *When we introduce ourselves, talking about our mountains and our rivers, they are literally part of us . . . there's a direct connection there because we have the river flowing through our veins, so if the river's unwell, we're unwell and vice versa.*
>
> (Linda Faulkner)

Another clear theme was connection inwards with self-knowledge, such as "a lot of that connection that I have with the environment actually comes from within me rather than something that's been taught to me" (Linda Faulkner). This theme appears to cross over to some degree with sensitivities and spirituality/wairua in a manner that would warrant further investigation. Such investigation was not the scope of this research.

Hinewai Ngatai articulated an overarching perspective of the connection being " . . . spiritual, emotional connection" evidenced throughout the raw data. Descriptions of 'connection inward' included wairua or metaphysical connection and relationships as being an everyday thing in their worldview as Māori, such as:

> *Back in the days of our tupuna we had tohunga that had that ability to be able to transition out of themselves and into a spiritual realm to be able to have a look at the greater environment and come back and relate that back to the people.*
>
> (Abraham Witana)

and:

> *It's not just the very visible physical elements of our environment at home, but there are also, we have of stories and traditions of beings up home who still exist up there who have a number of roles. They're neither man nor atua, but they're something in between. We still have people up home who can converse with them quite openly and get information from them and share information with them and get warnings from them. So we're fortunate to still have some of the remnants of that knowledge, but it requires active protection and passing on, which sometimes is hard to do.*
>
> (Linda Faulkner)

The results presented in these first two sections of this chapter have illustrated that humanity's inter-connection and inter-relatedness with the total environment were recognised and assumed as a base understanding by all participants.

7.4 Perceptions of Dis-connectedness

The themes resulting from analysis of the data in this section illustrate perceptions informed by Māori culture of an overall disconnection or forgetfulness of connection, from the environment as a feature and key weakness of mainstream Western culture and society.

Table 18: Disconnection in Society: "What is the relationship between people and the environment?"

Participant	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14
Disconnection Observed in/of Western Society and modern children	NR	D	D DE DI DC DS	D DE DC	D DE DC DS FC	D DE DI DC DS	D DS	D DE DI DS FC	D DE DI DC DS	D DE DC	D DC	D DE DI DC DS	D DE DI DC DS FC	D DE DC

Key:

D	Disconnection	DC	Disconnection from Community
DE	Disconnection from Environment	DI	Disconnection from Inwards/Self
DS	Desensitisation	FC	Forgotten/lost connection
NR	No Response		

Several participants suggested in a manner consistent with the literature (such as Chepesiuk, 2007; Fien, 2001) that lack of connectedness allows people to treat their surroundings (and themselves) with disrespect and behave in unhealthy ways. A majority of participants (13/14) commented that they observed a disconnection between pākehā and the environment and/or a general disconnection in the same vein as being an integral feature of the Western worldview and way of life including:

a) disconnection from the environment in general (10/14):

> *One of the interesting things about schooling and doing science is it often separates you from the environment.*
>
> (Linda Faulkner)

and;

b) disconnection from environmental components and characters in the holistic 'community' (10/14):

> *We've lost the comfort and the ability to do that, just to talk to the trees, like literally have a conversation with them and with the birds and with the river and it's really sad.*
>
> (Linda Faulkner)

and;

c) disconnection from one's inner-self's feelings and emotions (6/14):

> *It's a natural thing in this society to try and, y'know, 'fix it' and 'make it better', so you just stop crying 'cos that's 'wrong'! Y'know, 'you shouldn't be crying'.*
>
> (Linda Faulkner)

and;

d) disconnection from the inner self's spiritual/wairua capacity (6/14):

> *The great thing [sarcasm] about television is you don't have to turn into our mind's eye and go for a 'tipi haere'.*
>
> (Abraham Witana)

Several participants described alarm at their perception of Western society's influence (Winn, 1977 & 1988) upon rangatahi through immersion and integration (young people), and people in general, in terms of desensitisation and disconnection (Royal, 2007). There was considerable sorrow and concern expressed about this:

> *Our next generation coming along is being well and truly removed from all of those senses that we've been born with. We're getting moved further away from utilising our own senses. The TV and cell phone and games and technology that's coming . . . it's detracting you away from listening to the sound of the birds, watching how they interact, the environment, y'know, feeling that breeze against your skin and at the same time tasting that goodness of food you planted, from your garden. Knowing where that food came from how it was put there with love, and making the food in your kitchen, and all those things.*
>
> (Rawinia Puna)

Several participants described the process of industrialisation, technology and urbanisation as the catalysts for the process of desensitisation, distancing and

disconnection of people from their natural connections, and were perplexed as to what could be done about it to reverse the process:

> *You know, when I think about that I think about being connected to certain parts of the land. I wonder how you do that when you live in a city? Over concrete all the time (stomping feet); over tar-seal. You have no connection to the land, even your feet don't touch the Earth. So what do you do – do you whakapapa to Sky-towers or something like that?*
>
> (Dr. Hauiti Hakopa)

Several stories were described in the data illustrating the depths of effect of attachment and subsequent sense of loss through detachment from turungawaewae and immediate relationships related to relocation and distance and/or physical and biological changes through development disturbing sense of place and relationship. For example:

> *Uncle Morvin talked about a Kuia of his was standing next to the river one day and was crying and when he asked her why she said 'because the river doesn't recognise me anymore', because it had been changed so much and we have changed so much, moved away, she said 'and we don't recognise each other anymore'. It's literally like not recognising your first cousin or your brother or sister, because you've not kept in contact, kept in close touch for years and years and years and, so now, walking down the street and don't recognise each other. That's very much what it is like for me.*
>
> (Linda Faulkner)

7.5 Discussion and Implications

The focus of this chapter has been to investigate participant perspectives and understandings of relationships and inter-connections between people and the environment. It has also presented participant perceptions of disconnectedness within contemporary society. The data and findings presented in this chapter illustrate an embodiment amongst participants, all of whom are Māori, of critical ecologically-oriented understandings that are largely absent amongst mainstream Western worldviews (see for example, Coyle, 2005). These findings are persistent with observations by Williams (2004) of a pervasive conservation ethic within

Māori culture. Further, such qualities are described within the literature as critical to human survival and continuance (as described in Chapters 1, 2 and 3 of this thesis). Methods for their effective and meaningful transfer are widely and urgently sought amongst academics, educators and policy makers (see also Chapters 1, 2 and 3) because, despite recognition of a need for holistic understandings and approaches, contemporary mainstream efforts to date, such as 'environmental education' and education for sustainability', have not been successful in transitioning to them. Identification of a proven epistemology and/or pedagogy for EE/EfS based on holistic attitudes, values and ethics understandings of humanity's inextricable inter-connectedness, inter-relatedness and inter-dependence, would be extremely useful and timely for proactive efforts towards achieving human survival and continuance, if not an ecologically sustainable society.

The data resulting from this and the preceding chapter suggests that a semblance of a holistic epistemology and pedagogy for EE/EfS, hinging upon understandings and values related to inter-connectedness and respect of relationships, may exist within Māori culture. This research seeks to establish whether or not this is so and, if so, to identify ways in which it may be employed as a potential solution to gaps in mainstream perspectives and understandings, EE/EfS epistemology and practice.

7.6 Chapter Summary

This chapter has identified that perspectives informed by Māori culture:

- understand direct relatedness, relationship, connectedness and inextricable inter-dependence between humanity and all that is;

- understand human-environmental relationships as being reciprocal, interactive and interdependent at physical, biological, emotional, psychological and metaphysical/spiritual levels;

- include understanding and practice of direct communication and interaction with the living Earth and all its entities in an everyday fashion, reciprocating towards mutual well-being and sustenance;

- include familiarity if not conversance with connections and whakapapa, human or not, immediately affecting them, their lives and the environment in which they live;

- reflect qualities of environmental sensitivity, environmental awareness, and environmental literacy if not competence sought in the literature;

- perceive Eurocentric bias and marginalisation of Māori cultural beliefs and values in government policy and agency that limit perceptions of possibility for awareness, understanding and learning in Aotearoa-New Zealand towards the purposes of this research;

- perceive detachment, disconnection or forgetfulness of connection from 'the environment' as a feature and key weakness of mainstream Western culture.

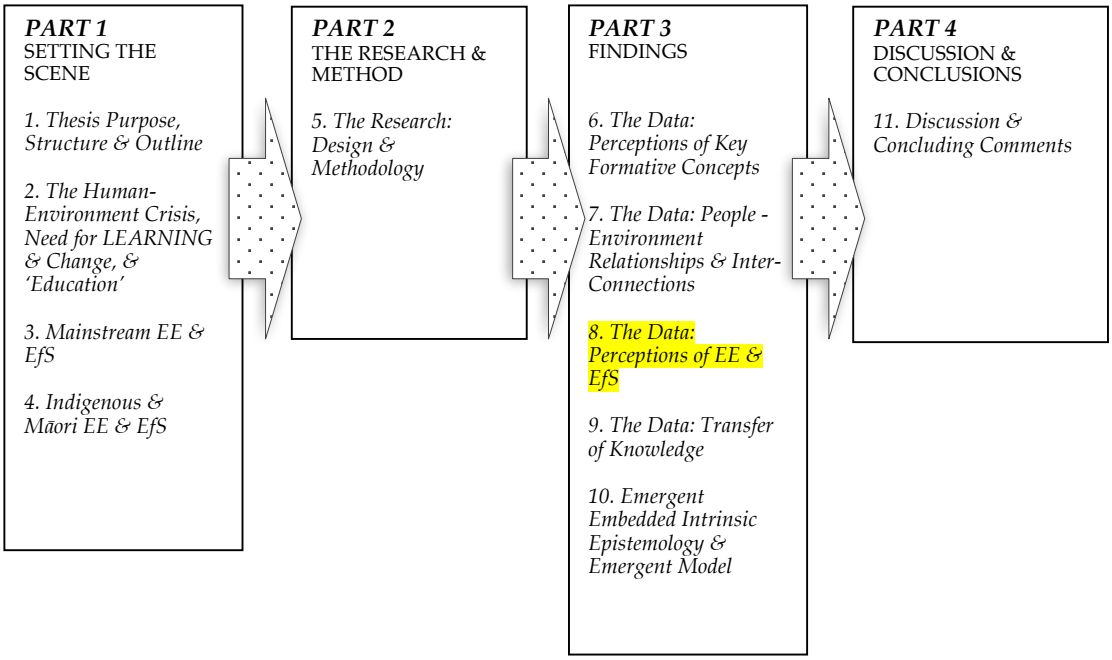
These findings are consistent with the literature describing general commonalities of indigenous cultures (see such as Hart, 2010), yet extend upon the literature by providing a specific insight to the context of perspectives and understandings informed by Māori culture towards the purpose of this research.

7.7 Chapter Conclusion

The findings of this chapter are consistent with those of the preceding chapter. Together these indicate a possibility of a holistic epistemology and pedagogy relating to understandings and values related to inter-connectedness and respect of relationships may exist within Māori culture, whether it is described in some way equivalent to 'environmental education' and 'education for sustainability' or not. This research seeks to investigate this amongst perspectives informed by Māori culture.

The following chapter will present the data describe perspectives and understandings informed by Māori culture of the composite constructs 'environmental education' and 'education for sustainability'.

8.0 THE DATA: Participant Perceptions of EE & EFS



8.1 Introduction

This research seeks to identify ways in which understandings and approaches informed by Māori culture might help address epistemological and pedagogical gaps in mainstream environmental education and education for sustainability.

This is the third of five results chapters informing this thesis. It will describe perspectives and understandings informed by Māori culture of the composite constructs 'environmental education' and 'education for sustainability'. The preceding two chapters (Chapters 6 and 7) have presented results describing participant perspectives and understandings of key terms and key concepts that shape and inform perspectives and understandings of 'environmental education' or 'education for sustainability'. Together, these first three chapters of this part of this thesis ground and contextualise the data, analysis and findings of the chapters that follow (see Chapter 5 for clarification of the grounded theory methodology engaged in this research).

This chapter is comprised of two sections. The first of these sections presents the data arising from responses of participants in this research relating to perceptions and understandings of the terms 'environmental education', and the second section of 'education for sustainability'.

8.2 Environmental Education

The themes in this section of this chapter illustrate that 'environmental education' was not a familiar or meaningful term or construct for most participants in this research. There appears to have been no construct or specific epistemology, pedagogy or descriptor equivalent to Environmental Education or Education for sustainability within understandings of Māori culture of participants in this research.

Knowledge, values and behaviours that equate to key objectives of mainstream Western EE/EfS appear to be intrinsic in perspectives informed by Māori culture: 'being Māori'. Perspectives informed by Māori culture, of people living and learning 'as' or 'as part of' the environment, have emerged from an analysis of objectives and approaches in participant descriptions of understandings of what construes environmental education.

The themes in this section describing ways in which 'environmental education' was understood from perspectives informed by Māori culture are:

- Western Constructs
- Tikanga and Mātauranga Māori
- Synergy with EE/EfS Theory on Objectives and Approach:
    - Awareness, Knowledge, Understanding, Attitudes & Values, Skills, Participation (Ministry for the Environment, 1998 p. 10)
    - In, About, For (Ministry for the Environment, 1998 p. 11)

- Environmental Sensitisation, Environmental Contextualisation, Environmental Literacy (see such as Coyle, 2005; Orr, 1990)

8.2.1 Environmental Education is a Western Construct

Table 19: Western Constructs: "What does the term 'environmental education' mean to you, if anything?"

Participant	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14
Environmental Education is	SO	SO WC	ED SO	EM ET WC	WC	ED WC	EfS WC			WC	WC		WC	EM ET WC

Key:

ED	Education	EfS	Education for Sustainability
EM	Environmental Management	ET	Economic Tool
SO	Sustainable Outcomes	WC	Western Construct

The term 'environmental education' appeared to hold little meaning for most participants. It appears that because environmental education did not have much meaning for some participants, not all participants engaged as fully as others with this question. Similar to that described in the previous chapter in relation to the term 'the environment', many participants appeared to be uncomfortable engaging the term 'environmental education'. For example:

> *I'm going to have to translate that. I'm not unfamiliar with those two words but just trying to wrap my head around what that actually means. Environmental education. Let's think. Nō ki te whenua. We belong to the land. . . .*
>
> (Dr. Hauiti Hakopa)

Similar to its composite words 'environment' and 'education' (see Chapter 6), 'environmental education' was perceived by many participants (9/14) as a Western construct with a particular bearing on the issues that have arisen in modern society consequent to human and, in particular, Western interventions with and impacts upon, the natural environment. It was described by several participants as part of reactive management – fixing

problems created by applications of technologies through human attitudes, interactions, interference and impacts. For example:

> *When I hear words like 'environmental education', that is really talking about this modern world that we are in – it doesn't refer all that much back to the historical pre-European Māori that* ***we*** *understand, but it certainly very much refers to it today. It's about how there is a lot more impact on 'the environment' today – te ao marama - than there was back then. And it's increasing, becoming increasingly so. Including things like biological controls or even issues like environmental risk management. I think that that's what 'environmental education' would mean to me and, in the context of today, there is so much more to understand about the environment, not so much for the environment itself, but for the types of management tools that are used to manage that environment.*
>
> (Matua Hori Parata)

Some participants (2/14) suggested that from what they have seen of the Western application of the term in Aotearoa-New Zealand and globally, environmental education has tended to be a 'environmental management tool' for justification of impacts for economic purposes, sometimes used by government and big business to justify economic decisions (an 'economic tool'):

> *. . . 'environmental education' is probably about big business, in regards to mining and industry, and I suppose (ha!) milling and farming and how to get the best results for crops and things like that.*
>
> (T2)

Five participants were familiar with the term 'environmental education' through their interactions with schools and school children, but also through various local and central government agencies and company advocacy. These participants each described the environmental education in terms of the themes of 'education for sustainability' and 'education' for ". . . better understanding the environment, so actually learning about the environment

itself" (Linda Faulkner). Such understandings overlap with the theme of 'education in, about and for' the environment, described later in this section.

Four of these same participants observed in similar ways that "the education system generally speaking still takes a very contemporary science, Western, science focus" (Linda Faulkner), but " . . . there is other knowledge and there are other avenues available to find out alternative information and how to understand and behave responsibly as part of all this" (Tui Shortland).

It was also observed by some participants in different ways that, when considering the advocates of 'environmental education', such tended to be people who have recently immigrated to Aotearoa-New Zealand from European countries and:

> *I find the whole concept of 'environmental education' is often couched in some expert coming in and saying 'this is the reality, and this is what you should do, this is what you need to learn, because obviously you're not applying it. And so that's problematic for me in terms of tāngata whenua because . . . by and large, no disrespect, it is white people, who are well educated, it's usually means they're middle to upper class, and that's a whole different reality from a lot of people who actually live on the ground and are finding it harder and harder to . . . be able to live the way that they've lived for generations in terms of subsistence. Not just in New Zealand but worldwide.*
>
> (Dr. Pip Pehi)

It was notable that the term 'Mātauranga Taiao' (Cooper, 2010) has not been used by any participant to describe a Māori cultural construct similar to mainstream Western descriptions of environmental education or education for sustainability. 'Mātauranga Taiao' (Eames et al., 2010; Cooper, 2010) was referred to by one participant (Tui Shortland) in reference to hearing about an exciting recent development of such a contemporary programme to deliver environmental education using Māori cultural principles in kura and secondary schools. She was unaware of particular details, including the programme no longer running beyond individual efforts.

A few participants spoke about "genuine traditional practices that, by their very nature, lead to sustainable outcomes are 'taught' to those coming behind by living the lifestyles modelled to them by elders" (Tahu Potiki).

8.2.2 Tikanga and Mātauranga Māori

Table 20: Tikanga & Mātauranga Māori: "What does the term 'environmental education' mean to you, if anything?"

Participant	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14
Environmental Education is	T	AW LS SS T	AW CS	AW	AW C T		T	AW C SS T WH	SS T	AW T		AW C SS T	T	AW

Key:

AW	A Way of Being	C	Connection
CS	Common Sense	LS	Life skills
SS	Survival Skills	T	Traditional Practices – tikanga
WH	Whakapapa		

A majority of participants (9/14) interpreted and explained environmental education in terms of, or in reference to, tikanga, taha Māori or mātauranga Māori and as ". . . a way of being" (Matua Hori Parata). Several of these participants had discounted the term as a Western construct but explained such as:

> *In the old ways, for our people, there was no need to teach that stuff, in the ideal of taha Māori, because growing up and learning whakapapa, whanaungatanga, as yourself and the community, the whenua, the ngahere, Tangaroa and that; learning about life-skills and how to learn and just 'be' as tāngata whenua, it's all wrapped up in that stuff.*
>
> (Abraham Witana)

Some participants spoke about 'environmental education' in terms of life-skills, such as taking their children out and ". . . teaching them how to listen to and understand and live off the land" (Rawinia Puna). Many responses included practical aspects such as life-skills and securing sustenance:

> *For me environmental education would be about what resources are available and how to use them. In a taha Māori aspect it's about knowing what the rongoa are, or the healing plants, it's about knowing what the kai is, the mahinga kai, where we gather our food from; that's the stuff we teach our kids or our nephews and nieces: by taking them out onto the land to gather things. And they learn about how to use them and what to do with them.*
>
> (T2)

Several participants explained that immersion in such ". . . experiential, practical and meaningful learning helps build life-skills" so that commonly:

> *as 4 year olds and 5 year olds, [the children] already know what's going on with their environment and they tend to show the new people, like foreigners and that, what's going on? Where to get the pipi. Where not to go swimming. That sort of thing.*
>
> (Tui Shortland)

Abraham Witana explained that much of what is taught and learned in ways informed by Māori culture is " . . . often taken for granted at the time, absorbed in the process and just a part of 'being'". Dr. Hauiti Hakopa described such learning as being a process of ". . . being imbued with that knowledge and those skills . . .".

8.2.3 EE/EfS Theory on Objectives and Approach

Themes representing theoretical definitions of and approaches to, environmental education (and education for sustainability) were identified in the data. The nature of environmental education definitions and approaches to environmental education influences environmental education practice. These resulting themes are presented in the following sub-sections.

8.2.3.1 EE/EfS Theory: In, About and For

Table 21: In, About, For: "What does the term 'environmental education' mean to you, if anything?"

Participant	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14
Environmental Education is		In About For	In About For As	About	In About For As	About		About For As	About For As		In About For	In	As	About

Key:

In	Education in the environment	About	Education about the environment
For	Education for the environment	As	As one with / part of environment

As the results indicated earlier in this section of this chapter, the term 'environmental education' appeared to be a new term for many participants. Also as explained earlier in this section, despite this newness, most participants engaged with the term, even for the first time. Over half the participants (9/14) referred to environmental education in terms of " . . . learning about the environment . . ." (Linda Faulkner), or 'informational learning' (Coyle, 2005)

Almost half the participants (5/14) described learning 'in' the environment, such as " . . . going out onto the land . . . (T2). Almost half (6/14) also described learning 'for' the environment for such reasons as " . . . we need to protect the mauri of the land and everything to do with land; otherwise we are not going to survive" (Dr. Hauiti Hakopa).

Several participants (5/14) described living and learning as or 'as part of' 'the environment' as te taiao. For example:

> *We are the environment in which we find ourselves in. The basic 'what is' is that we are related, we are indivisible from what goes on around us: we are indivisible from the people, we're indivisible from the natural world, we're indivisible from what goes on in the spiritual world. Whether we believe in it or not, it will still affect us. And so it is that we live and learn as an indivisible part of that.*
>
> (Dr. Pip Pehi)

This is a surprising result, given it has emerged in the context of learning (or 'transfer of knowledge') rather than in the context of inter-connections and relationships addressed in Chapter 7 or descriptions of 'the environment' in Chapter 6, as might have been expected.

8.2.3.2 EE/EfS Theory: Awareness, Knowledge, Understanding, Attitudes & Values, Skills, Participation

Table 22: Awareness, Knowledge, Understanding, Attitudes & Values, Skills, Participation: "What does the term 'environmental education' mean to you, if anything?"

Participant	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14
Environmental Education is		A K U S	A K	A K	A K U AV S			A K U AV S	A K S		A K	K AV S		K

Key:

A	Awareness	AV	Attitude & Values
K	Knowledge	S	Skills
U	Understanding		

Most participants (9/14) described understandings of environmental education in terms of knowledge. A typical example was:

> *'environmental education' for me is about better understanding the environment, so actually learning about the environment itself*
>
> (Linda Faulkner)

Half of the participants described environmental education in terms of raising awareness of and helping ". . . people understand the importance of the environment" (T2), while another three described it in terms of being about instilling " . . . an appreciation of what it naturally gives to us and how to respect it" (Rawinia Puna).

8.2.3.3 EE/EfS Theory: Environmental- Sensitisation, Literacy, Contextualisation

Table 23: Environmental- Sensitisation, Literacy, Contextualisation: "What does the term 'environmental education' mean to you, if anything?"

Participant	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14
Environmental Education is					ES EC EL			ES EL				ES EL		

Key:

ES	Environmental Sensitisation	EL	Environmental Literacy
EC	Environmental Contextualisation		

Three participants included descriptions of developing awareness of sensitivities and honing them. Each qualified their descriptions as being informed by Māori culture. One example describes all three aspects of this theme, as indicated with code in brackets through the text below:

> *'Environmental education', to put a Māori context to it is a 'tikanga o te taiao' – or its how things happen within the, within the environment. And again it goes back to the transfer of knowledge with our older people, taking us out with them and having a tutu within and having a look and listening to all that's within Te Tai Ao. And, when we listen we're not listening to what the Kaumātua and Kuia are saying; we are actually being taught to listen to the sound of 'the environment'* (ES)*: to the wind, whether or not you believe it or not, to the sun – the rays of the sun, to the rain drops, to the sound of rivers, and to the sound of the sea itself* (EL) *for . . . Just to give an example, because I live in a place called Pungaru, we're kind of inland from the coast, and one of the sounds for us when the coast was rough was hearing the sound of the sea in our rivers* (EL/EC).
>
> (Abraham Witana)

8.3 Education for Sustainability

The themes in this section illustrate that 'education for sustainability' was considered a Western construct with little credibility by most participants in this research. This result is consistent with the results for the themes of 'sustainability' (see Chapter 6) and 'environmental education' in the section

above. Other themes in the results reflect efforts by some participants to describe what education for sustainability should be or could be if informed by Māori culture.

Table 24: "What does the term 'education for sustainability' mean to you, if anything?"

Participant	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14
Education for 'Sustainability' is	WC SO	WC SO	T PF SO	WC N UI	WC UI	T AEE GB	WC EE	T GB	T PF	WC UI	SO	T GB	T WC GB UI SO	WC GB

Key:

AEE	Applied Environmental Education
GB	Giving Back
PF	Proactive for Futures
T	Traditional Practices – tikanga
WC	Western Construct
EE	Environmental Education
N	A Nonsense
SO	Sustainable Outcomes
UI	Uninformed Interference

Over half of the participants (8/14) perceived education for sustainability as a Western construct, and " . . . a nonsense" (Matua Hori Parata), with little buy-in or practical potential for meaningful application:

> *Education for sustainability is about (ha!) academics deciding what's right for everyday people, for me, that will never be sustainable, because until the people decide that it's important to them and widely held and deeply felt, then they won't do it. Regardless of what rules or boundaries are suggested; until people actually see "shit, I can't take my son to the beach and he can't-to find a paua, 'cos there are no paua there, it won't be widely held and it won't be deeply felt. Until they go to the bush and realise that it's all been cut down, then I don't see people seeing "oh actually, we really need to protect this". And so I s'pose its about people's accessibility to the things that we're, the academics and people that have had the opportunity to do those things, see as important.*
>
> (T2)

This result is persistent with the results for the themes of 'sustainability' (see Chapter 6) and 'environmental education' in the section above.

Some participants perceived the two as being one and the same thing 'education for sustainability' . . . [as] . . . the latest term?" for environmental education (see such as Sauvé, 1999) and spoke of rebranding and 'reinvention of the wheel'.

Four participants, made distinction between the two terms based on personal experiences and observations in the education and environmental management sectors, whereby:

> *. . . 'education for sustainability' was taking the 'environmental education' knowledge and using it to figure out how we can live more sustainably, or how we can exist in the environment and still provide for future generations, so achieving some sort of balance.*
>
> (Linda Faulkner)

The same four participants had adopted the current Western terms and evolved an individualised blending of their understandings informed by Māori culture with proactive interpretations of the terms of education for sustainability focused on sustainable outcomes:

> *When I hear that word 'education' I hear, 'oh, we're here to learn something'. So we need to learn to 'sustain' this earth for the greater good, so it will be here as a legacy for many more generations: it should be rippled throughout every workplace and every institute and every home, in and around how we can sustain the mauri – the life-force of this Papatūānuku - our Earth - for the greater good of future generations.*
>
> (Rawinia Puna)

Most participants displayed contempt for the term 'sustainability' and its contemporary applications such as represented in 'education for sustainability'. For example:

When our old people talk about how we are going to 'sustain' [gesturing speech marks] ourselves into the future they think about land; as being the source of everything, as well as being our identity. Not just for growing trees. Not just for putting buildings up or, y'know? We bury our people there for goodness sake, eh? We look after that, we look after those places. We go and talk to the dead; we go and sit by them go and talk to them, go and bury things in there and say 'Hey'. Sustainability should be about all that kind of stuff. Aww, pff! 'Sustainability – what does that mean? Sustain a particular lifestyle, I guess. 'Education for sustainability'? I don't know. I don't buy that buzz word.

(Dr. Hauiti Hakopa)

A few participants reflected upon their own reactions and perspectives informed by Māori culture critically during the interview process, and questioned the robustness of the ideals and capacity expressed of Māori culture by them in the context of contemporary society. For example:

Well I guess the idea is to kind of sustain, sustain what we have and to 'educate for sustainability' is to tell people how they can do that. Again I think people are aware of that. Perhaps that knowledge has been lost to a huge degree?

(Dr. Pip Pehi)

8.4 Chapter Summary and Implications

The results of this chapter illustrate 'environmental education' and 'education for sustainability' to be unfamiliar and extraneous terms in understandings of participants in this research, informed by Māori culture. However, the results of this and preceding chapters indicate that knowledge, values and behaviours described as key objectives for mainstream Western EE/EfS in the literature (see such as Ministry for the Environment, 1998; Ministry of Education, 1999b; UNESCO-UNEP, 1978) appear to be intrinsic in perspectives informed by Māori culture represented in this research. Such qualities have been described in the results as 'being Māori'. Further, this chapter has found perspectives informed by Māori culture amongst participants, of people living and learning 'as' or 'as part of' the environment.

The results of this chapter suggest that because perspectives informed by Māori culture understand that humans live and learn 'as' or 'as part of' the environment, there has been no apparent development of or need for a specific epistemology, pedagogy or descriptor addressing people's sustainable interactions with the environment within Māori culture, particularly in a historical indigenous context. It is therefore probable that the knowledge, values and behaviours pertaining to Māori cultural understandings of relationship, connection and interaction with the environment are embedded within Māori culture and transferred intrinsically within Māori cultural settings. It may be that investigation of understandings and approaches informed by Māori culture for facilitating a transfer of knowledge to help imbue a cultural conservation ethic where it is lacking may help identify epistemology and pedagogy that may inform the purposes of this research.

8.5 Chapter Conclusion

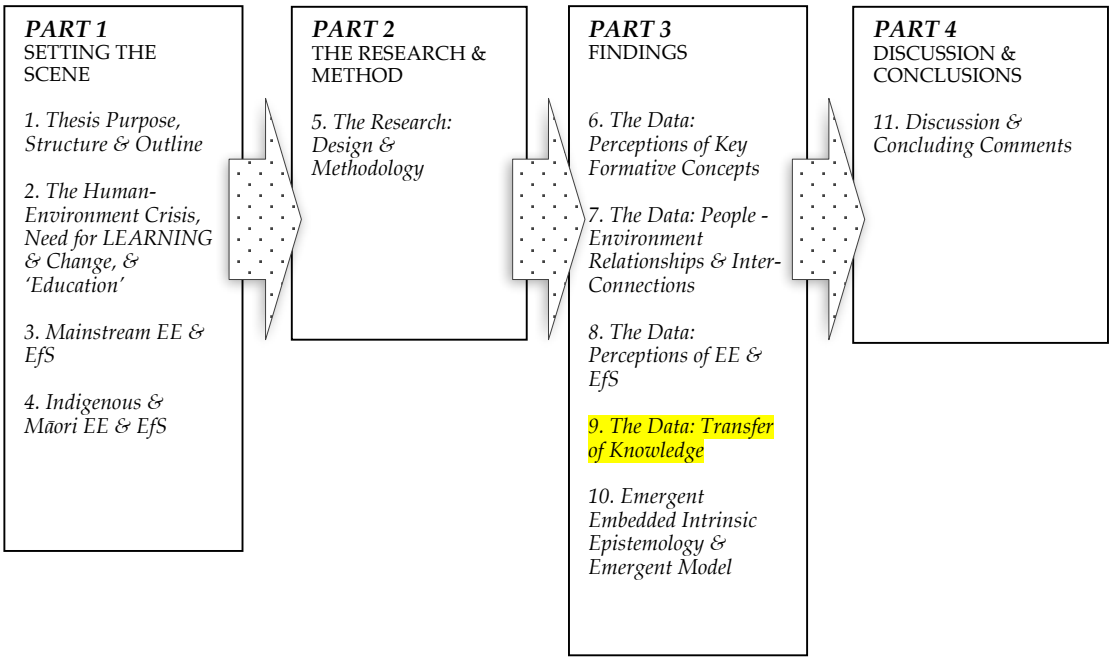
The observation that the terms 'environmental education' (EE) and 'education for sustainability' (EfS) had little or no meaning or application in most participants' perceptions and understandings of traditional Māori culture is consistent with the observations of Chapter 6 of this thesis. Given the observation in Chapter 6 that the key formative terms 'the environment', 'education' and 'sustainability' appear alien to Māori cultural understandings represented in the data, such a result was anticipated.

What is of particular interest to the purpose of this research, arising from analysis of the data of this chapter is that, despite there being no parallel construct or practice, not only are holistic worldviews and a conservation ethic commonly evidenced in the data, Māori cultural educational pedagogy or methods of transfer of key knowledge (see such as Royal, 2007) appear to be extremely well aligned with critical, yet to date elusive, holistic objectives sought through mainstream Western EE/EfS. Consideration of this and the findings of the preceding data chapters have led to theory that an analysis of descriptions of ways in which knowledge pertaining to understandings of relationship, connection and interaction with the environment is transferred

within traditional and contemporary Māori cultural settings may reveal an epistemology and pedagogy that will significantly inform the purposes of this research.

The following chapter will present results from analysis of participant responses describing or illustrating methods of transfer of knowledge relating to imbuing a Māori cultural conservation ethic.

9.0 THE DATA: Transfer of Knowledge



9.1 Introduction

The purpose of this chapter is to investigate participants' understandings and approaches informed by Māori culture for facilitating a transfer of knowledge to help imbue a cultural conservation ethic equating to EE/EfS.

The research presented in this thesis uses a grounded theory methodology (see Chapter 5) to identify ways in which understandings and approaches informed by Māori culture might help address epistemological and pedagogical gaps in mainstream environmental education (EE) and education for sustainability (EfS). The findings presented so far, in Chapters 6, 7 and 8 of this thesis, indicate that an epistemology and pedagogy that facilitates a holistic cultural conservation ethic equating to the objectives of EE/EfS may be embedded in Māori culture. The results of Chapter 6 have found that understandings of 'education' and the purpose and process of learning informed by Māori culture appear to equate to ideals and key objectives of mainstream Western EE/EfS. The results of Chapter 7 substantiate Williams'

(2004) observations of a pervasive conservation ethic within Māori culture (Williams, 2004) and suggest an epistemology and pedagogy for learning arising from perspectives and understandings of universal inter-connectedness, inter-dependence and respect of relationships exists within Māori culture. Chapter 8 has established understanding of both how mainstream EE/EfS is understood from perspectives informed by Māori culture, and how it perhaps 'should' be, including purpose and objectives, indicating an intrinsic epistemology and pedagogy embedded within Māori culture. Identification of a proven holistic epistemology and/or pedagogy for EE/EfS would be extremely useful and timely for academic and practical applications in achieving shifts towards an ecologically sustainable society.

This chapter will first introduce and explain the use of the term 'transfer of knowledge' within this chapter and henceforth in this thesis. It will then present data and findings that describe the transfer of knowledge; what knowledge is transferred, by whom, how, when, where and why; in order to identify an epistemology and pedagogy articulated or evidenced within participant responses. A brief discussion of the key findings of this chapter will precede a summary of findings and chapter conclusion.

The main themes in this chapter address

- What key knowledge, values and skills are transferred;
- Where knowledge, values and skills are transferred;
- When knowledge, values and skills are transferred;
- Who is involved transferring knowledge;
- How transfer of knowledge, values and skills occurs:
    - *Learning styles and communication preferences;*
    - *Educational aim: to inform, guide, or facilitate*
    - *Approach: 'in' the environment, 'about' the environment, 'for' the environment*
    - *Methods of engagement*
    - *Timing, use of time and duration*
    - *Tools*
    - *Setting*
    - *Activities and Content*

- Why knowledge is transferred in these ways.

The following section will explain why the term 'transfer of knowledge' has been engaged in this chapter as a predominant description of a process of learning for the purposes of this thesis rather than the mainstream Western term 'education'.

9.2 Transfer of Knowledge

The results of this research so far have reinforced in various ways that there are no direct parallels in translation or practice of several Western, English terms to the language or worldview of Māori (such as 'the environment', illustrated in Chapter 6), and vice versa of Māori constructs to English and Western perspectives (such as 'whakapapa', as illustrated in Chapter 7). This observation is consistent with those of Royal (2007, p. 25), and highlights why it is so important for research such as this to seek to understand cultural and individual perspectives of terms and constructs, even in an essentialised degree: not doing so can be problematic.

As described in the results of Chapter 6, the Western term 'education' was not commonly engaged as a descriptor by participants because, from their understandings informed by Māori culture, it was not considered an adequate term to describe the inter-related, inter-dependent, life-long process of learning for life. Descriptions of a 'transfer of knowledge' was:

> *When I was growing up it wasn't called 'education' or 'learning' at all to us. It was a 'transfer of knowledge' as opposed to a 'learning'.*
>
> (Abraham Witana)

Accordingly, this chapter engages the term 'transfer of knowledge' in the manner interpreted of the participants in this research, as reported in the preceding chapters.

The following sections of this chapter will report the key aspects of transfer of knowledge that contribute towards developing a conservation ethic within an

individual and community, as described by participants and/or identified in the analysis of data from this research.

It is appropriate to note at this point of the reporting of results that there are places where the same data crosses over and sits in more than one area of description. For example, 'play' has been described by participants in the context of 'time', and as being important in the transfer of knowledge as well as development and reinforcement of skills, while also being described as a method of engagement or 'approach' as well as a teaching 'tool' and 'content'. Such multiple placement of subthemes in themes and categories may appear repetitive, but in fact reflects the dynamism and complexity of the learning process that has emerged from analysis of the interview data in this study, as well as informing the wider research objectives.

In a similar vein, it is also appropriate to note here that restrictions upon the acceptable number of words in the presentation of a PhD thesis have constrained the extent to which repetition, and to a considerable extent coding, has been described and explained in this chapter. Two hundred and forty-three codes were developed in the course of the analysis of data in this research, as has been described section 5.8.4 of this thesis (p. 135). Key themes and categories of interview data have been described in this chapter. However, many subthemes are to a degree self-explanatory under the themes in which they are placed. While I acknowledge that the data in the following sections of this chapter might have been condensed somewhat and perhaps presented as fewer themes in fewer tables, or perhaps even as a summary table (thus reducing incidence of repetition and the extent of unexplained coding), I have chosen not to simplify presentation in this chapter. The themes, subthemes and categories presented in the following sections of this chapter provide the basis for meta-themes that are later developed through the grounded theory methodology of this research and presented in Chapter 10.

9.3 What knowledge is transferred?

The themes in this section of this chapter identify mātauranga or knowledge and its being respected, valued and maintained as a key set of knowledge for

transfer or dissemination in perspectives informed by Māori culture. The transfer and evolution of knowledge itself through whakapapa and other cultural mechanisms is identified as an important part of mātauranga.

Whakapapa is described as a key set of knowledge, and as a cultural mechanism for transferring and maintaining cultural knowledge, including facilitating understanding and respect of connectedness, relatedness and inter-dependence of past, present and future as an oral history and data base. Whakapapa is also described as important knowledge to imbue and maintain individual and community senses of identity, place, belonging, context, purpose and direction. Whanaungatanga has been described in this section as an important knowledge for transfer to understand, respect and maintain relatedness and relationships.

The optimal development and well-being of individuals to individual potentials is an important goal identified in this section, rather than a particular knowledge set. Such an approach requires a targeted personal and/or integrated approach to facilitation. Descriptions of this will be addressed later in this chapter.

A key theme for transfer is that of 'life-skills', including practical, applied skills for survival, tikanga and other ethical and behavioural guidelines to keep safe (in a holistic sense) for survival, well-being and continuance.

A distinction between male knowledge and female knowledge is identified, which when acknowledged and combined, are understood to afford balance.

This section also describes community values and skills in working together as an important set of knowledge, values and skills for transfer in perspectives informed by Māori culture.

Table 25: What knowledge is transferred?

Participant	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14
Transfer: What?	A	A AT V S SU	A AT V S	A AT V S	A AT V S	A AT V	A AT V S SU	A AT V S SU	A AT V S SU	A AT V S	A AT V S SU	A AT V S	A AT V S SU	A AT V
	M T	M T WH WN WT SWI MC PPF R P LS IS	M WH WN WT R P LS SP	M T WH WN SWI MC PPF R P LS IS	M T WH WN WT SWI MC PPF P LS SP IS GS	M WH WT MC PPF R P LS SP IS	M T WH WN WT MC R LS SP	M T WH WN WT SWI MC PPF R P LS SP IS GS	M T WH WT MC R P LS SP IS	M T WH WN WT SWI MC PPF R P LS SP IS	M T WH WT MC R P LS IS	M PPF R LS GS	M T WH WN WT MC PPF R P LS SP IS GS	M WH WN WT PPF R P LS SP IS

Key:

A	Awareness	AT	Attitudes
LS	Life-skills	GS	Gender Specific
IS	Individual Specific	M	Mātauranga
MC	Meaningful Context	P	Practical
PPF	Past/Present/Future	R	Respect
S	Skills	SP	Spiritual
SU	How to live Sustainably	SWI	Survival With Integrity
T	Tikanga & Ethics	V	Values
WH	Whakapapa	WN	Whanaungatanga
WT	Working Together/Rōpūtanga		

All participants identified " . . . the maintenance of knowledge; the maintenance of mātauranga" (Matua Hori Parata) as a key set of knowledge for transferral. Dr. Hauiti Hakopa suggested that it is " . . . not the value of 'education'. . . [but] . . . the value of mātauranga, the value of knowledge . . ." that needs to be learnt, " . . . and we need to learn about the value of how that knowledge can be disseminated too. Our knowledge and the way we disseminate that knowledge should form part of everything that we do".

A key cultural mechanism for transfer or dissemination of knowledge appears to be whakapapa. All but one participant (13/14) described whakapapa and whanaungatanga (an understanding of relatedness, and appreciation of connectedness and inter-dependence), as both the baseline and most important knowledge set for transfer, whether relating to the environment and sustainability or otherwise. For example, with regard to whakapapa:

> *It's all about the whakapapa: knowing that whakapapa; I think it must be in*

> *the entire process of understanding who you are, your relationship to everything around you too, but becoming aware of **truly** who you are in terms of your whakapapa links in terms of your potential to 'be'.*
>
> (Dr. Hauiti Hakopa)

It was explained by most participants (9/14) in various ways, such as indicated in the above example, that knowledge of whakapapa helps engender a sense of identity, place and context in the sense of time and space, connection and belonging, meaning, purpose and direction.

With regard to whanaungatanga (13/14):

> *The basic 'what is' is that we are related, we are indivisible from what goes on around us: we are indivisible from the people, we're indivisible from the natural world, we're indivisible from what goes on in the spiritual world, whether we believe in it or not, it will still affect us. Basically if the natural environment is paru, we will be paru.*
>
> (Dr. Pip Pehi)

Most participants described whakapapa interwoven in all lessons, waiata, karakia, korero and other oratory, as a regular if not perpetual reminder of the inter-relatedness, inter-connectedness and inter-dependence of all that is. For example:

> *It wasn't just stories for stories sake, it's always they have a purpose and there's always a lesson learnt from what we're learning. There's not only a lesson learned but there's also a whakapapa within the story as well.*
>
> (Tui Shortland)

Some participants described whakapapa and whanaungatanga in relation to development of relationship and maintenance of an individual's turungawaewae:

> *And that is how we come to become and know where it is we belong; where our roots arise from, where our ancestors are buried and where we stand, where*

> *our feet are rooted to: literally stand, cos that's what it means: turungawaewae. That's my whenua: where I always long to return. And what seeds we've grown from, and the source of our sustenance and nurture. So when we are away we are always connected and know who we are and remember with the karakia and whakapapa; and when we return, we know we have grown from that whenua there and will return to the whenua, to the Earth, and belong.*
>
> (T14, original emphasis)

Several participants explained that in perspectives informed by Māori culture not all knowledge should be accessible to everyone. For example:

> *In the work that Ngai Kaihautu does, they often refer to kauae runga and kauae raro: the knowledge, or the upper jaw and lower jaw, and the two schools of learning, and about kauae raro knowledge being that knowledge that is appropriate for everyone to know to survive and to get on in life; and kauae runga is more that celestial or spiritual 'wairua' knowledge that is only appropriate for some to know, because if that knowledge was held in the wrong hands, it can be used for negative purposes – for 'bad' rather than 'good'. There are parts of the knowledge that we have as Māori that aren't appropriate for everyone to know because of a range of things.*
>
> (Linda Faulkner)

The results indicate that successive levels of knowledge are imbued through an individual's development concurrent with their level of maturity and abilities or qualities or otherwise 'readiness' they exhibit or is detected by kaumātua. Such observations were consistent with the literature (see such as Royal, 2007; Williams, 2004). A variety of mechanisms were described by participants that help control and limit access of certain knowledge to levels of understanding (Williams, 2011), or even protect knowledge from access by those who are not ready, are uninitiated, or otherwise unqualified. For example:

> *. . . it was done in a metaphoric manner, where it was in a sense riddles that those that had the ability to understand knew what the answers were. It*

wasn't something that was just given out to every Tami, Hori and Haki (laugh) – Tom, George or Jack, y'know? It was put in that metaphoric language to identify who out there, or who within the whanau, the hapu or the iwi, had that particular gift to transfer that knowledge to.

(Abraham Witana)

Specialist knowledge was described by many participants as being exclusive, so that a select few who show certain qualities are sought by kaumātua, often guided by wairua, sometimes when the initiates are in early childhood. For example:

I was brought up with many tohunga in and around my whanau and purposely placed in certain situations . . .

(Rawinia Puna)

The themes of respect and integrity were linked with whakapapa and emphasised by several participants in their responses. "Whakapapa helps grow an appreciation of how it's all linked and so appreciation of life being taken or some sacrifice being made for kai. So it's about learning respect and valuing by us showing that for the young fellas to see and imbuing that stuff" (T14). Karakia was commonly described as an appropriate means of remembering and honouring these connections and relationships ". . . with respect and integrity" (Matua Hori Parata). For example from a earlier quotation:

For me the karakia is not about a ritual that needs to be done in a certain way, karakia for me for my kai and for my inner is to say 'thank you' and to have gratitude for being provided for with sustenance. But more than that, so say I'm eating fish, it's to recognise the moana that fed the fish, it's to recognise the person that caught the fish if it wasn't me, it's to recognise the fish for giving up its life for me to eat it, it's the sunshine that grows the food and then, eventually it's thanking everything.

(Dr. Pip Pehi)

Several participants (5/14) described an objective of living responsibly and to "survive with integrity" (Matua Hori Parata) and thereby live sustainably in an ecological sense:

> *So that you can still feel alright about what you think you know and how you learnt it. There was that main 'aho' or that main 'thread' that went through the way that we all did stuff, and how we all maintained the cultural and spiritual integrity of ourselves as part of 'the environment'.*
>
> (Matua Hori Parata)

Almost all participants (13/14) described the sets of knowledge, values and skills, including "imbuing them with the skills to know and understand who they are: tapu" (Dr. Hauiti Hakopa), as 'life-skills':

> *understanding not only yourself, but also how you actually fit into the environment that you are dealing with at a particular time. How to survive, be well and carry on with integrity.*
>
> (Matua Hori Parata)

Most participants (10/14) described ". . . a process of tikanga and ensuring that we as a person had carried out things in the right manner and with respect to whatever it was that we were doing" (Te Moengarau Hemopo).

Many participants (10/14) described tikanga in a particular context (geographical, ecological, social, etc.) as to what, how, where, when and why to behave and do things in a particular way. These tikanga established practical, applied ethical and behavioural guidelines resulting from observation of environment and environmental indicators over extended periods. So, for example:

> *. . . our tikanga Taiao to do with the moana again was around fishing. For us in the Hokianga, the best time to go fishing was on the third quarter of the moon. How great your catch is – depended on the shape of the moon. On the third quarter, sometimes you'd get a bowl. And if the bowl was more towards the bottom end of what you would take as being the moon, then you were likely*

to succeed at having a good week's fishing. If it was on the side, then you were starting to think 'ah, well, the fishing isn't gonna be great, but we'll still get a feed'. And if it was on the top, then it would be a waste of time going fishing in that third quarter – we're better off to leave the kai moana alone, so it can sustain itself again, and then wait until the right period or for the right moon to come back in. When the bowl shape was at the bottom, . . . the transfer of knowledge that we got was, from our Kaumātua and Kuia was, your nets are going to be full; when the moon shape or bowl shape was to the side, then it was basically telling us that, you'll catch fish but a whole lot of it would fall out of your net. And if it was on the top, then that's just telling us that, 'oh, waste of time going fishing or putting your net out because you're gonna catch nothing'.

(Abraham Witana)

All of the themes described in this section were included by most participants as being vitally important towards individual and collective well-being through the cultural mechanisms of tikanga and kaupapa. Some limitations were noted by participants in relation to these. For example:

From what I understand, the role of tikanga and kaupapa is about keeping us safe. Unfortunately tikanga is often used in tikanga Māori circles or by people today as a way, as a weapon, as a way to control people; which I guess it was always a mechanism for as well. But the original idea and concept behind that was to keep us safe and keep us connected; keep us connected to those spiritual realms, keep us connected to the environment or Papatūānuku, which really are all inter-weaved into the same thing at some level.

(Dr. Pip Pehi)

Several participants expressed the opinion that because tikanga is something that makes sense of conditions of the time and location or context – and were not and should not be set in concrete:

Māori are extremely pragmatic, practical people, always have been, always will be, and tikanga are established to fit a certain context. But because our knowledge, our traditional knowledge has been kinda frozen in time because of

colonization, we still often hang on to these rules and boundaries that actually aren't relevant anymore, because we're in a completely different context now.

(Linda Faulkner)

Such sentiments are consistent with the literature (see such as Royal, 2007, pp. 29-31).

More than half the participants (9/14) described being ". . . a student of our past in order to understand yourself and the now in the present and so know the nature of what's coming . . ." (Dr. Hauiti Hakopa) in order to " . . . have an understanding of what we need to do in the future" (Abraham Witana) as an important knowledge and capacity for transfer hinging on whakapapa and other cultural mechanisms. For example:

Whakapapa is like a road-map of marker posts for us from the time of origins through to the present day. It's not a detailed map, but it has deep layers of information relating to every 'marker post'. See, each 'marker post', if you like, is an ancestor, and marks a significant someone, step or happening that has contributed to the shaping of what and who is in the 'now'. For each 'marker post' there are stories, and for each story there are lessons to be learned so that those who follow and hear and understand, may benefit.

(T14)

Because of this oral history:

We can always look back through our genealogies and through our korero, through the transfer of knowledge that has happened, to be able to say 'okay, the constellation looks like this now; I maumahara ana a hau ki i i te kau nga e tau hurinei – I remember seeing that constellation ten years ago exactly the same, and in that year, the crops didn't do well, our fishing wasn't the greatest, so it meant that we needed to prepare in advance and to make sure that our whanau, our hapu, had enough kai to be able to last until the fall of matariki and again the rise of matariki. And now our tikanga Tai Ao was based around that.

(Abraham Witana)

Many participants (9/14) described connection with and understanding of spirituality and wairua (see Chapter 7 of this thesis) as important knowledge for transfer in learning for life. The identification of this need in perspectives informed by Māori culture is consistent with those identified in the literature (see such as Power, 2001).

All but one participant (13/14) identified 'life-skills' as a key set of knowledge, values and skills for transfer. "Life-skills are pretty much about learning the skills of life and how to survive, whether you are brought up in a city, whether you are brought up in the country" (Hinewai Ngatai). Life-skills were further explained as:

> *. . . the skills that we don't get taught and yet are essential in terms of the environment . . . It depends on the context, it depends on the environment and environment in the way that I would use [the skills]. If you are in an urban city, then your life-skills will need to be different. If you living in an abusive relationship, your life-skills need to be different. If you living in a privileged lifestyle where you have education, you have everything that you need and could possibly want? Your life-skills are different. I don't think there's a time too far ahead in the future where the way that we are choosing to live will no longer be possible and we will have to be closer to the environment, to the physical world, to the natural world. And therefore our life-skills will be hugely different.*
>
> (Dr. Pip Pehi)

There was a common range of descriptions of what comprised the set of knowledge, values and skills of 'life-skills'. For example, several participants stressed that being aware of and becoming proficient with one's own senses, so as to be sensitive to and literate of one's surroundings, components and associated nuances are very important content and outcomes of learning and knowledge transferral. Such qualities have been described in the literature (see such as Coyle, 2003; Orr, 1992) as environmental sensitivity, environmental awareness, environmental literacy, and environmental competence. Adamson (2012) describes such sensitivities being portrayed in

the contemporary science fiction movie *Avatar* (Cameron et al., 2009) as a quality of the fictional indigenous species, the Na'vi. Competence in this area was described as important for capacity to adapt and adjust to change or to different contexts, such as being in different geographic locations.

One participant for example, Abraham Witana, described:

a) listening:

> *When we listen we're not listening to what the Kaumātua and Kuia are saying; we are actually being taught to listen to the sound of the whole 'the environment', and the parts of the whole: to the wind; whether or not you believe it or not, to the sun – the rays of the sun; to the rain drops in the air and on the ground, to the sound of rivers, and to the sound of the sea itself, and what it means. It's not listening to the sound itself, it's listening to the mauri or the essence of what it is that you're getting; the sounds of the <u>whole</u>.*

b) smelling:

> *. . . the smells that are in the ngahere as well. You can smell the kai moana, I can smell the kai moana, you can smell the coast, and I can also smell where fresh water is as well, and the different sounds between the two; fresh water and salt.*

c) watching:

> *. . . which birds are where and which direction.*

d) practicing:

> *If we're out there getting toheroa, for instance, you can hear toheroa, when you, when you pull them out of the – it sounds a bit like a sucky sound, but it's again, it's like its last breath; a 'haa . . .', y'know, that comes out, although it sounds like a 'plop'.*

e) mastering:

> *If I go into ngahere now, just as long as I have a visual of where the sun is, I can find my way out – never to get lost.*

All of these qualities or skills were described as being passed on by way of experiential learning using multiple learning modes of visual, audio and kinaesthetic (Fleming & Mills, 1992). "That visual, audio, and kinaesthetic thing, I think it's inherent in all Māori, and that's how we learn" (Abraham Witana).

A deep respect of kaumātua and of the knowledge and kaupapa was evident amongst all participants in reference to the sources of their knowledge of things Māori. For example:

> *For me I have one Matua, one Whaea, one Kuia left. The life-skills I learnt from them I know are 100% with me in mind. They teach me what I've needed to know to survive and to do well.*
>
> (T2)

Community strength and support gained by ". . . learning and knowing each other, and working together in rōpūtanga, through mutual respect, communicating, collaborating, cooperating . . ." (Rawinia Puna) was described by several participants as being important in a cooperative community. "Rōpūtanga is about doing it together and sharing, and that's one of the main principles around mātauranga . . ." (ibid.).

In relation to rōpūtanga, some participants referred to ". . . male and female roles in Māori [culture], which vary from iwi to iwi . . ." (T14), sometimes leading to different perspectives between genders that may not always be recognised, but is reflected in Māori cultural cosmology.

> *There's a difference between what women teach and see and how we see the world and what men teach and see and understand things. It's about balance:*

> *Papatūānuku and Ranginui. That's how we look at things. Women teach one set in what we do, while the men do their thing or whatever, and there are certain ways of seeing things and talk through that that the Tāne may miss out on, or they may be aware of also, depending on their role inside that hapu.*
>
> (Te Moengarau Hemopo)

Most participants in some way described elements of awareness, knowledge, understanding, connection, attitude and values, skills and motivation to participate (Ministry for the Environment, 1998, p. 10) as being key knowledge for transfer and experiences to be facilitated and/or for mokopuna and rangatahi to be guided through and/or informed about, including:

> *Values, morals, communication, life-skills, spirituality, heightening all their senses they've been born with; knowing themselves and understanding themselves and <u>being</u>, knowing you-who-you-are-and-may-be.*
>
> (Rawinia Puna, her emphasis)

Almost all participants (13/14) were clear that values and ethics should be instilled as an integral part living and learning including " . . . taking only what is needed for a feed" (Abraham Witana) " . . . with respect . . . and watching and caring to look after it, learning how to grow, how to plant, how to re-feed it; how to mahi kai, about our sea; so there will be enough for tomorrow and for future generations" (Hinewai Ngatai). This set of ethics and principles was described by Matua Hori Parata as " . . . tools for survival with integrity".

9.4 Where does the transfer of knowledge take place?

The key theme that emerges from this section is that practical, meaningful and engaging connection and context, relevant to the individual learner or set of learners and relationship with the environment, is far more important for transfer of knowledge pertaining to be effective than 'where' a transfer of knowledge is sought to be facilitated.

Table 26: Where does the transfer of knowledge take place?

Participant	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14
Transfer: Where?	In MC LE	In MC HS W L N LBE LE EP	In MC N LE CG WS	In MC HS N LBE T LE	In MC HS W N LBE LE CG	In HS LE EP CG	 MC HS W N LBE LE CG	In MC HS W L N LBE LE CG	In MC HS W LBE LE EP CG WS	In MC HS LBE LE EP WS	MC LE EP	In MC HS N LBE LE CG WS	In MC HS W L N LBE LE EP CG WS	In MC HS W N LBE LE CG WS

Key:

CG	Cultural Gatherings	EP	Education Programme Settings
HS	Home Settings	In	In the Environment
L	Land/on the hill	LBE	Lead By Example
LE	Life Experiences	MC	Meaningful Context
N	Ngahere/bush	T	Travelling
W	Water	WS	Work Settings

A majority of responses by participants (12/14) indicated perceptions that transfer of knowledge happens all the time and that " . . . we can learn just by being in a certain place (Dr. Hauiti Hakopa). For example:

> *Learning is for me acquiring knowledge or skills or abilities or awareness that we didn't have before. So we are always learning, I think, in this lifetime, wherever we are.*
>
> (Dr. Pip Pehi)

For most participants (13/14), more important than a specific 'where' as key places of transfer of knowledge pertaining to relationship with the environment and ways in which to interact, was a personally meaningful context for the individual learner or set of learners (depending on the context or situation) for transfer of knowledge to be effective. For example from an earlier quote:

> *When I talk about koru Ruapehu to them, when I do it from Waikanae, it's pretty meaningless to them, but when we are actually up in Ohakune and looking at the mountain and it's freezing cold or, even better if it's been snowing and there's snow sitting on the ground, it's much more meaningful for them, 'cos it's right there: they can see it, they can smell it, they can feel it.*

(Linda Faulkner)

All such places had involved practical, social or cultural relevant, meaningful and engaging setting from within a Māori worldview, including cultural gatherings including "at hui and wānanga on the marae and public meetings and open days, or visiting kura . . ." (Rawinia Puna).

Most participants described transfer of knowledge occurring " . . . on the water within that moana, within that coastal environment" (Abraham Witana), or "out on the land to gather things; out on the hill, in the tussock . . . (T2), or "out in the Ngahere, in the bush, doing it. Letting them feel it, sense it, bond with it and know themselves a bit and how it makes you feel . . . listening to the sound of the birds, watching how they interact, 'the environment', y'know, feeling that breeze against your skin" (Rawinia Puna).

All participants described everyday life experience settings, such as "at own home, leading by example, modelling respect, practicing whanau ora and that . . ." (T2) or "working in the field . . ." (Rawinia Puna), as being typical of meaningful contexts for most effective transfer of knowledge taking place.

Some participants described the importance of exposure to new situations and settings, the likes of " . . . travelling around the place, seeing how other people did stuff" (Matua Hori Parata), so being able to compare and contrast and so develop an informed opinion.

9.5 When does the transfer of knowledge take place?

The themes in this section of this chapter identify transfer of knowledge most taking place throughout life experience and events, and most significantly during childhood. Learning is understood to occur as and when learners are ready, and is facilitated accordingly either through engineered opportunities or as circumstantial opportunities arise.

Table 27: When does the transfer of knowledge take place?

Participant	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14
Transfer: When?	OP	HG CH CX OP R MOP	CE CH EH OP	HG LE CH CX OP R MOP	HG LE CH EH OP R MOP AP	LE CH EH CX OP R	CE LE CH CX OP R AP	LE CH EH CX OP R MOP	LE CH CX OP MOP	HG LE CH CX AT	LE CH R	HG CE LE CH EH OP R MOP AP	LE CH R MOP AT	HG LE CH CX OP R MOP

Key:

AP	At Play	AT	All the Time
CE	Cultural Events	CH	Childhood
CX	Contextual	EH	Early Hours
HG	Hunting & Gathering	LE	Life Events
MOP	Make Opportunities/Set up	OP	Opportunistic
R	Readiness		

Transfer of knowledge was described by participants as occurring as a matter of course through practical life events and situations, positive and negative, " . . . throughout one's life.

> *Lessons come daily. Lessons come from having a coffee with a friend to watching your child fall over to having a conversation with a passer-by who's lost and doesn't know which bus to catch. Lessons come at any opportunity and it's not in any sort of structure. And sometimes you don't understand you've just had a lesson until after the fact.*
>
> (Hinewai Ngatai)

All but one participant described childhood as a key time, both for developing readiness and desire or motivation to receive knowledge and for the transfer of knowledge that helps people understand relationships and interconnection with the world around them and positively influence durable values and behaviours that make sense towards sustainable behaviours:

> *Ever since I can remember, since I was a kid, basically, there was no time that I was told 'right, are you ready to be told?'. Since I was a baby pretty much you were shown how to do things, you're sung the songs, you're told the*

karakia, what to do, what not to do, so . . . since birth. Or probably since before birth, actually.

(Tui Shortland)

Most participant responses (10/14) suggested that the best time for knowledge transfer in general is when the prospective recipient is either gauged 'ready' by elders or otherwise demonstrated ready in age or stature or competence. For example:

When we were kids, we basically had to wait until we were nearly teens before we could actually go out into the moana to get kutai. It wasn't 'til you turned maybe about 16 before you could actually get into the water to get the kutai off the water, because that's where the bigger, better, fresher, tastier kutai were, was actually on the rocks in the deep water. And they, the reason for that were the older kids obviously knew how to swim a lot better than us younger ones, and they were just trying to ensure that us smaller kids were kept in a safe environment, but had the ability to observe and watch how the older kids were doing it and that. We'd be sitting there rubbing our hands together and thinking that 'my birthday's next year (laugh), I wanna get out there and do that!'.

(Abraham Witana)

In such a way " . . . there is always incentive to be the best you can be to get to do that stuff. The old fellas only tell you once, so you learn to pay attention and be ready . . ." (T14).

Several participants qualified what they meant by readiness by contrasting what they have seen of mainstream Western perspectives of readiness in Aotearoa-New Zealand and elsewhere. For example:

Pākehā judge when our mokopuna and rangatahi are ready or 'qualified' by them giving 'the right answer': the one the system wants. We judge readiness by them asking the right question: and that is a different thing altogether.

(Te Moengarau Hemopo)

Three participant responses described cultural events as an important time of knowledge transfer (as described earlier in this chapter). In both instances participants described indirect transferral, through observation and repetition of the likes of whakapapa during a hui, or direct transferral through the likes of wānanga and instruction of certain tikanga.

Almost all participant responses (11/14) indicated that knowledge transfer should take place as and where the opportunity arises, when there is something to learn from a situation or context that is likely to be significantly reinforced by immediacy. Several participant responses (8/14) advocated manipulating or making opportunities or 'setting it up' so that knowledge transfer may occur in a controlled or engineered situation. Such situations were described in hunting and gathering settings. Half the participants described hunting and gathering as important times for knowledge transfer. For example:

> *I took a kid out last week, through work, took him for the first time he'd ever been paua diving. So I showed him what a decent size paua felt like and what a 'just on the limit' paua felt like; gave him an empty shell to hold and he held that for twenty minutes as we walked over to Taieri Island. So he knew what he was looking for by the time we got there. When we got in the water we would have seen 300 paua, but only about four of those were take-able, and our tikanga was 'the first time you pull a paua that's undersize, we hop out of the water and we go back'. So he was trying really hard to make sure he found the right size paua. When he popped it off it was legal, and he'd had his hand on probably fourty or fifty other paua that he thought might have been legal. So by not pulling those paua he's actually protected the bed for the next generation.*
>
> (T2)

9.6 Who is involved in transferring the knowledge?

The key themes that emerge from this section is that everyone is a teacher and everyone is a learner. Kaumātua and kuia are described as key facilitators in

the transfer of knowledge, as are family members and life experiences involving situations, other people and interactions within te taiao.

Table 28: Who is involved in transferring the knowledge?

Participant	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14
Transfer: Who?	NR	K O LE TU CH	K T P F LE TU CH	E K O P F LE TU	E K LE TU CH AT	E K T F SW TU U MS	E K P F LE TU CH	E K T O P F LE TU U MS CH AT	K P F LE TU	E K P F LE U CH	K O P F LE	E K P F LE SW TU MS CH AT	E K O P F LE SW TU U MS CH AT	E K O F LE TU AT

Key:

AT	Atua	CH	Children
E	Everybody is a 'teacher'/learner	F	Family
K	Kaumātua	LE	Life Experience
MS	Māori Scholars	NR	No Response
O	'Others'	P	Parents
SW	Self-within	T	Tohunga
T/T	Tutuing / Trial and Error	TU	Tupuna
U	University		

All but one participant described kaumātua and kuia as key facilitators of learning in the transfer of knowledge:

> *It's my Kaumātua and Kuia that I need to acknowledge; they're the ones that transferred all of that, all of the korero that I'm sharing now with you.*
>
> (Abraham Witana)

Most participants (9/14) described everyone is an 'educator', each with a different capacity, from whom others may learn; and at the same time, everyone is a 'learner' and " . . . as learners, people learn how to go about passing that knowledge on to others" (Chris Holtham).

Almost all participants (11/14) described tupuna (their grandparents or ancestors) as being a direct source to them and very important in the transfer of knowledge.

Most participants (11/14) acknowledged " . . . have[ing] learnt a lot from whanau members . . . and certainly from some of the Kaumātua and Kuia up

home, but probably more so from Aunties and Uncles and cousins" (Linda Faulkner) as well as children and interactions with te taiao.

Most participants (12/14) described transfer of knowledge as occurring within themselves through life experience, through such experiences as pregnancy, motherhood, loss of a loved one, or even travel. For example:

> *We learnt a lot not only from our uncles and our parents, but we learnt a lot out of our own life experiences of travelling around the place, seeing how other people did stuff.*
>
> (Matua Hori Parata)

A few participants (4/14) included the wisdom of Māori scholars as being critical in the transfer of important knowledge, particularly and increasingly in times when fewer and fewer tohunga are alive. For some participants, University or Wānanga in the contemporary sense, are a gateway for access to the transfer of knowledge by way of staff and programmes, including Māori scholars. For example:

> *I also did go to university and did Māori Studies and got a whole lot from that because you actually have access to writings of amazing people like Hohepa Kereopa and Māori Marsden and all of those people, who spent their whole lives with this powerful knowledge about a whole range of things and have shared some of that in writing.*
>
> (Linda Faulkner)

9.7 How does transfer of knowledge occur?

> *Learning can take place in a number of different ways for us. We can sing a song. And we should be able to pick those up. We can read for instance – now that we've been taught to read. But we should be able to observe and learn too. You've gotta observe, gotta be able to sit and watch. Gotta ask the right questions. Gotta be prepared for the elliptical way in which our ancestors speak, you gotta follow them in the story, they go all over the place, but eventually they'll get there. They'll sort you out. When you are ready to*

> *receive it. It'll be clear, but you need to go away and start thinking about those things that have been said. It may take years. The light will dawn on you one day; and when it does you will know. The body should light up, the mind should become clear and you should know.*
>
> (Dr. Hauiti Hakopa, his emphasis)

In this section methods of transfer of knowledge have been grouped and described in terms aligned with the purpose of this study, mainly relating to elements of contemporary mainstream education and environmental education pedagogy introduced in Chapter 3 of the literature review of this thesis, including:

- Learning Styles and Communication Preferences
- Educational Aim: Inform, Guide, or Facilitate?
- Approach: Education in the environment, about the environment, for the environment
- Methods of Engagement
- Timing, Use of Time and Duration
- Tools
- Setting
- Content and Activities

9.7.1 What Learning Styles and Communication Preferences are Evidenced?

Identifying individual and collective learning styles and communication preferences evidenced in the data is useful for the purposes of this research in helping understand how participants plan, prepare, engage and 'pitch' content, activities, tools and approaches in their pedagogy so they may optimise outcomes and effectiveness of learning towards objectives.

The themes in this subsection identify almost all learning preferences exhibited by understandings and approaches to transferral of knowledge informed by Māori culture to be visual, aural/oral, and kinaesthetic.

Reading and writing were not a strong communication style or learning preference for most participants.

Table 29: Learning Styles and Communication Preferences Evidenced

Participant	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14
	NR	V A K	V A R K	V A R K	V A K	V A R K	V A K	V A R K	V A K	V A R K	V A K	V A K	V A R K	V A

Key:

V	Visual/Observation	A	Aural-oral
R	Read-write	K	Kinaesthetic

All but one participant described a transfer of knowledge in terms that reflected strong Visual, Audio/oral, Kinaesthetic learning and communication preferences in terms of Fleming and Mills' (1992) VARK. Less than half of participant responses (6/14) included references to text-based communication as a learning medium. Most participants (13/14) described practical, hands-on experience as critical to effective and successful transfer of knowledge, told first, demonstrated and retold, then guided initially if need be. For example:

> *I was able to see the effects it was having on something else, . . . to hear what those effects were, so . . . tasted like a sweet coconut, . . . we were touching the right fern frond . . . we were able to see what it looked like, and then, . . . hear the plant. So that visual, audio and kinaesthetic thing, I think it's inherent in all Māori, and that's how we learn, and how we have that ability to get that transfer of knowledge across for us or how we know it today as 'learning'. It's all through the tutu. They'll not experience it or they won't learn. It won't sink in if they can't 'feel' it.*
>
> (Abraham Witana, his emphasis)

9.7.2 Educational Role & Aim to Inform, Guide, or Facilitate?

Identifying participants understanding of 'educational' aims and 'educator roles' in their descriptions of their experiences and practices in facilitating

learning with specific attention to relationships and interconnections with 'the environment' and 'living sustainably' is useful in helping this research understand, compare and contrast their pedagogy with mainstream EE and EfS in order to identify any particular strengths, weaknesses or emergent pedagogy useful to the purposes of this research.

The themes in this subsection suggest that, despite most participants not being trained educators, guiding and facilitation of learning appears to be perceived as the key role and aim of facilitators within understandings and approaches to transferral of knowledge informed by Māori culture.

Table 30: Educational Role & Aim: Inform, Guide, or Facilitate?

Participant	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14
	INF	G INF	F G INF	G	G	F INF	G	F G INF	F G	G	G	F G	F G	F G INF

Key:

F Facilitate G Guide INF Inform

Participant descriptions of educational roles and aims were considered in this analysis in terms such as those of the Ministry of Education's *Guideline for Environmental Education* (1999b), to assess whether participants perceived appropriate 'education' is:

a) delivered as information;

b) assisted through guiding;

c) empowered through facilitation

Most participants (12/14) emphasised roles and approaches equivalent to guiding and facilitating individual and small group opportunities for practical, experiential learning with meaningful, useful and useable outcomes.

Many participants (6/14) noted a perspective that some forms of knowledge may only be transferred through telling and/or listening and/or watching, which may equate to 'informing'. However, all participants clearly described an understanding of the key roles and nature of transfer of knowledge or 'education' that affects learning to be best facilitated and guided as self-directed experience and critical thinking, despite most not being trained educators.

9.7.3 Approach

Identifying participants' educational approaches is useful in helping this research understand, compare and contrast their epistemology and pedagogy with mainstream EE and EfS, in order to identify any particular strengths, weaknesses or emergent pedagogy useful to the purposes of this research.

The key themes arising from this subsection are that, while most facilitation of learning was described in terms of learning 'in' the environment and for the environment, a new theme evidenced in Chapter 8 has persisted of approaches to facilitating learning 'as' or 'as part of' the environment. One to one, flexible and adaptive approaches are described as most effective for transfer of knowledge. A tension was evidenced in perceptions of integrated (Māori cultural – Western) approaches. Leading by example is described as a favoured approach.

Table 31: Approach: Education in the environment, about the environment, for the environment?

Participant	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14
	About NR	In About For OC CA T FX S GP 1:1 IS IL CTX LBE WP IA	In About For As T FX S GP 1:1 FL IL NRV WT LBE WP IA CC	In For T FX S SIR GP 1:1 IL CTX LBE	In For As T FX S SIR GP 1:1 IS CTX WT LBE WS	In About FX S SIR GP FL IL CTX WP IA CC WS	In About For T FX GP 1:1 IL CTX WT LBE	In For As T S SIR GP 1:1 FL IL CTX WT LBE WS	In About For As T FX GP 1:1 IS IL CTX WT LBE	In For FX GP 1:1 IS FL IL CTX NRV LBE IA WS	In About For FX S GP 1:1 CTX LBE WP IA CC	In For T FX S SIR 1:1 IS IL CTX NRV WT LBE CC WS	In About For As T FX S GP 1:1 IS FL IL CTX NRV WT LBE IA CC WS	In About For T FX IS CTX NRV LBE WS

Key:

1:1	Individual / one to one	About	About the Environment
As	As one with / part of the Environment	CA	Cultural Assessment
CC	Curriculum / Controlled	CTX	Contextual
FL	Formal	For	For the Environment
FX	Flexible to individual and situations	GP	Groups
IA	integrated Approach (Māori and Western)	IL	Informal
In	In the Environment	IS	Individual Specific
LBE	Walk the Talk/Lead By Example	NR	No Response
NRV	Need Responsive	OC	Operant Conditioning
S	Selective (Interests/Ability/Character/Special Skills)		
SIR	Station / Inherited Role	T	Tikanga
WP	Western Paradigm	WS	Wairua / Spiritual
WT	Work Together		

Participants' descriptions of their approaches and experiences facilitating learning reflected various combinations of environmental education approaches modelled widely in EE and EfS policy (see Ministry for the Environment, 1998; Ministry of Education, 1999b, p. 11).

All but one response described the transfer of knowledge as being in the environment in similar ways to Lucas (1979). Some participants rationalised that the best place to imbue understandings of and connections with the environment are obviously:

> *. . . in the environment; if you talking about the river,* ***on*** *the river; if you are talking about the bush, doing it* ***in*** *the bush rather than how we tend to do things which is, y'know, classrooms, rooms, whiteboards, paper . . .*
>
> (Linda Faulkner, her emphasis)

Most participant responses (12/14) indicated an objective of transferring knowledge of people's connectedness and inter-relatedness with all environmental components towards appropriate interactions with the environment in order to ensure that future generations have access to plentiful resources, "for ever more" (Abraham Witana). This equates to education 'for' the environment. Just over half of the participants (9/14) spoke of teaching and learning 'about' the environment, its components, inter-relationships, inter-connections and inter-dependencies, including traditional stories of creation, their purposes and their names, which very often are a product of or describe those factors.

Some participants (5/14) described learning and living as part of the environment or as the environment. These five participants emphasised their understanding of an over-riding importance for learning to acknowledge, understand, embrace, respect, be about and imbue 'knowing' people are an inextricably inter-related, inter-connected, inter-dependent part of te Taiao, as tāngata whenua (people of the land). This is a key finding emerging from this research process.

Most participants (11/14) described their experience of one to one approaches being the most effective for transfer of intimate knowledge, such as developing and practicing awareness and sensitivity with environmental elements with tohunga, kaumātua, karaua or kuia, in most situations. In this way, personalised, individual needs are able to be identified and addressed, and specialised skills and attributes developed.

Most participants (12/14) also described flexible and adaptive approaches in transferring knowledge in order to cater to different contexts, individual needs, changing circumstances, unforeseen developments and opportunities:

> *I constantly adapt the approach, but I s'pose I go back to the same mohiatanga, or the same knowledge, so I have different ways of working with people because that's what's effective for them. But I still hold the same kaupapa, which is to help the person or to assist them to help themselves. So, although the way we talk to each other or the things we might do are different, the kaupapa's still the same.*
>
> (T2)

Several participants explained in various ways that through such approaches as described above, as individual sensitivity, awareness and skills are heightened, students are increasingly motivated to seek, learn and practice more knowledge and skills for themselves.

Many participants (9/14) described tikanga as a method of transferring knowledge and/or as the basis of knowledge transfer. Some participants displayed a mixture of western and Māori worldviews and values, sometimes apparently at odds with each other:

> *I had a very pākehā up-bringing and I have a science background* [however] . . . *I think science, once you make a connection to it, the only problem with our curriculum is it's hard to actually get kids connected to it.*
>
> (Linda Faulkner)

Other participants (4/14) were of the view that there are incompatibilities and tensions between Māori and Western worldviews, so that attempts to combine or integrate the two beyond tokenism are effectively doomed to failure. These observations are consistent with authors such as Royal (2007) and Williams (2004).

Half of participants in this research included descriptions of wairua or methods related to spirituality in their approach.

Most participants (12/14) described an approach of leading by example in order to transfer knowledge and do so credibly throughout their lifestyle:

It's trying to encourage my own, first and foremost, and <u>then</u> my extended whanau, going into schools within the Te Rarawa rohe, or going and face some community groups, 'cos they want to learn a bit more. I take every opportunity I get to be able to transfer that knowledge, especially to our younger Māori tamariki.

(Abraham Witana)

9.7.4 What Methods of Engagement are Described?

Identifying participants' descriptions of ways they have experienced or themselves gone about, engaging learner interest and focus, is useful in helping this research understand and identify any particular strengths, weaknesses or emergent pedagogy useful to the purposes of this research.

The key themes in this subsection identify whakapapa, connectedness and storytelling as key methods of engagement in understandings and approaches to transferral of knowledge informed by Māori culture, along with practical, proactive, confronting and meaningful activities.

Table 32: Methods of Engagement

Participant	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14
	NR	I RE WH C ST KS P	REC PA WH C ST KS KISS	I REC WH C ST KS A/T P	I REC PA WH C ST KS A/T P G	CON RE WH C ST KS	I REC PA WH C ST KS A/T P KISS G	CON REC PA WH C ST KS A/T P	I CON PA WH C ST KS A/T P KISS G	I PA WH C ST KS P	CON PA WH C ST P	I CON REC PA WH C ST KS A/T P G	I PA WH C ST KS A/T P KISS G	I C ST A/T P

<u>Key</u>:

A/T	Ako / Tutu / Trial and Error	C	Connection
CON	Confronting	EX	Experience
G	Games	I	Immersion
KISS	Keep it simple	KS	Kaumātua Sourced
NR	No Response	P	Practical
PA	Proactive	RE	Reactive
REC	Reciprocal	ST	Story Telling
WH	Whakapapa		

Almost all participants (12/14) described the use of whakapapa and illustrating connectedness through storytelling as effective methods of transferring knowledge, developing whanaungatanga with senses of belonging and mutual responsibility.

Immersion in cultural activities and in wānanga, particularly on and around the marae from an early age and throughout one's lifetime, was described by many participants (9/14) as a very powerful and effective method of transferring knowledge by several participants.

Most participant descriptions of methods of engagement (11/14) were of hands on, practical activities, either orchestrated or opportunistic, during which students are informed, guided and facilitated towards an achievable outcome with direct relevant consequence for their input and level of performance.

Several participants (5/14) described effective mechanisms or methods of promoting lasting learning such as:

> *Being in a confronting and uncomfortable environment is actually a really good environment to learn in. I'm not sure how to articulate that, but it's almost like because all of your usual comforts and barriers are gone and you're so out of your comfort zone, out of your normal environment that it almost makes you more open to receiving information.*
>
> (Linda Faulkner)

Most participants (9/14) described proactive, visionary methods of motivating groups and individuals " . . . actually planning and setting smart goals, so they actually achieve what they want and they've got a pathway to get there" (T2) to share and transfer knowledge ". . . so that progress is visible or tangible . . ." (T2), promoting a sense of purpose, achievement and effectiveness, and so encouraging further efforts.

A few participants (2/14) described reactive technocentric methods of transferring knowledge to counter in responding to and countering 'environmental problems'.

Several participants (4/14), notably those more regularly involved in educational facilitation, stressed that if delivery of information is necessary it is best to 'keep it simple' to retain engagement, leading into practical hands on sessions.

9.7.5 Timing, Use of Time and Duration

Identifying participants' descriptions of ways they have experienced or themselves gone about, engaging learner interest and focus is useful in helping this research understand and identify any particular strengths, weaknesses or emergent pedagogy useful to the academy.

The key themes in this subsection identify that passage of time holds little meaning in perspectives informed by Māori culture, while timing in terms such as readiness, is considered very important.

Table 33: Timing, Use of Time and Duration

Participant	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14
	NR	TA TO TS TE	TEH TA TO TS TE	TA TT TR	TEH TO TT TR	TEH TO TS	TA TO TT TE	TA TT TE TR	TEH TA TO TS TT TE	TA TO TT	TA TS TE	TEH TA TO TT TE TR	TA TO TT TE TR	TA TT TR

Key:

NR	No Response	TA	Time Anytime
TE	Time Engineered Circumstance	TEH	Time Early Hours
TO	Time Opportunity / As Arises	TR	Time When Ready
TS	Time to Schedule/Programme	TT	Time As Long as it Takes

Many participant responses reflected a common perspective of, in some ways, the passage of time holding little meaning or importance in balance with the

importance of appropriate process of learning and meaningful outcomes:

> *It didn't matter how long it took . . .*
>
> (Abraham Witana)

On the other hand, participants described various ways in which timing in terms such as 'readiness' and appropriateness through season, occasion or event, is considered very important and useful in facilitating effective transfer of knowledge. In such cases the timing of information transfer was described as being selected and implemented carefully. For example, several participants described the early hours of morning being targeted by elders, sometimes through, or reinforced by, ceremony or ritual during wānanga, as the time to pass on knowledge that needed to be remembered for a lifetime:

> *The Kaumātua and Kuia at that time, they were telling us that's when all the spirits are awakened and our minds are more open and had the ability to take in information and retain it forever.*
>
> (Abraham Witana)

9.7.6 Tools

Identifying participants' descriptions of educational tools is useful in helping this research understand and identify any particular strengths, weaknesses or emergent pedagogy useful to the purposes of this research.

The key themes identified in this subsection illustrate whakapapa and storytelling, as well as ensuring meaningful context as effective pedagogical tools for imbuing qualities key in developing life-skills.

Table 34: Tools

Participant	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14
Tools	NR	WH ST MHM MC RPT	WH ST MC CCC WT	WH ST MHM MC PPF	WH ST MHM MC WT RPT PPF	WH ST MHM MC RPT	WH ST MC WT PPF	WH ST MHM MC CCC WT RPT PPF	WH ST MC WT RPT	WH ST MC CCC WT RPT PPF	WH ST MC WT RPT	WH ST MHM MC CCC WT RPT PPF	WH ST MC CCC WT RPT PPF	WH ST MHM MC PPF

Key:

CCC	Communication/Collaboration/Cooperation	MC	Meaningful Context
MHM	Metaphor / Hidden Meaning	NR	No Response
PPF	Past/Present/Future	RPT	Repetition
ST	Story Telling	WH	Whakapapa
WT	Working Together		

All but one participant described using whakapapa, storytelling and ensuring meaningful context as very effective and long serving tools within Māori culture for transferring knowledge:

> *When I've tried to pass on knowledge from up home, for example, to cousins of mine or to nieces and nephews, it has dawned on me the power of turning information into interesting stories, because you're much more likely to remember an interesting story than just keeping it to the facts. I know, for example, when I've shared information with nieces and nephews by relaying it in those powerful stories that were given to me, they were fascinated. And so the whole way that our grandparents, our great grandparents, have passed on information through stories now makes complete sense to me. Trying to find ways to make information meaningful for them, otherwise it's just information.*
>
> (Linda Faulkner)

Repetition was also described by many participants (9/14) as a related and very effective tool in transferring and reinforcing knowledge, such as the same story related at different times by different people, perhaps in different ways, or whakapapa recited consistently. For example:

> *We would be brought into the maraes, particularly when there were tangi on or even certain hui with a large kaupapa that we had, and during the tangi*

time we learnt about whakapapa. That's how that transfer of knowledge happens - having to sit there and to listen to the whakapapa of the person that had been deceased. On the second night, or the night before that person was buried - we call that night 'poroporoakī', or his last farewells - that was a time when any relative that was related to that person could get up and relate a story of how they were related to that person, or some of the deeds or actions that he had done.

(Abraham Witana)

While repetition was commonly described as an important tool, several participants (5/14) conversely also explained that because important things are not said lightly, these tend to be said only once and not repeated. This was described around the transfer of special knowledge, such as during wānanga and learning the likes of tauparapara.

These explanations by participants highlighted the importance of effective attention and focus of communication skills – particularly of listening – within an essential Māori cultural worldview and re-emphasised the level of skills expected within communication preferences of VAK (Fleming & Mills, 1992). These observations are consistent with descriptions in the literature (such as Royal, 2007; Williams, 2004).

Several participants (8/14) described knowledge of the past as a critical tool for understanding the now and so forecasting what is likely to happen in the future. Another tool, also described above in this study as a method, is ensuring that the knowledge being transferred and the experience of the transfer itself, is relevant, meaningful, in context and confronting, so more likely to evoke an emotional involvement and passion, along with motivation for an outcome.

9.7.7 Setting

For the purpose of this study, 'setting' differs slightly from location or 'where' transfer of knowledge takes place. While the location of an event describes physical or social features, such as 'in the environment', 'setting' goes further to describe less tangible aspects of a situation that may add to mood or character,

such as might a formal setting versus an informal setting, as well as wairua or spiritual properties. Different settings may be utilised to influence educational engagement, experiences and outcomes Lucas, (1972), not only in terms of physicality, such as whether an activity is indoors or outdoors, but also in terms of cultural, social, psychological and spiritual contexts (Panelli & Tipa, 2007). This subsection presents data describing the importance participants placed upon different settings.

The key themes illustrated in this subsection are that informal, nature-based or home settings that include cultural and spiritual aspects are most effective for transfer of knowledge transferring life-skills.

Table 35: Setting

Participant	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14
	NR	IL HAS WKS CS NB SP	FL IL HAS CS SP WC	IL WKS CS NB SP	CS NB SP	FL IL HAS CS SP WC	IL HAS CS NB SP	IL HAS CS NB SP	IL HAS WKS CS NB SP	FL IL HAS WKS CS NB SP	FL IL WKS CS SP WC	IL HAS WKS CS NB SP WC	FL IL HAS WKS CS NB SP WC	IL HAS WKS CS NB SP

Key:

CS	Cultural Activity or Context	FL	Formal
HAS	Home Activity or Context	IL	Informal
NB	Nature Based Activity or Context	NR	No Response
SP	Spiritual Activity or Context	WC	Western Classroom Activity or Context
WKS	Work Activity or Context		

Most participants emphasised informal, nature-based or home settings as most important in the transfer of knowledge imbuing a meaningful conservation ethic. All but one participant described cultural and spiritual settings as also being very important. A few participants' responses reflected a leaning towards associating transfer of knowledge with formal institutional and classroom settings in a more standard western context, in keeping with contemporary educational practice.

9.7.8 Activities

Participant responses were analysed to identify sorts of activities they engaged in seeking to transfer knowledge towards the development of awareness, knowledge, understanding, connections, attitude and values, skills, motivation and participation in a conservation ethic.

The key themes in this subsection indicate that storytelling associated with hui and wānanga are believed to be the most effective activities for transferring knowledge underpinning life-skills.

Table 36: Activities

Participant	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14
Content & Activities	NR	HG GP HU WĀ KA KH KO IM ST	HG TA HU WĀ WS KA KH KO IM ST	HG TA HU WĀ WS KA KH KO IM ST	HG GP TA HU WĀ WS KA KH KO IM TU AH ST	GP TA HU WĀ WS KA KO ST	GP HU WĀ WS IM ST	HG GP TA HU WĀ WS KA KH KO IM TU AH ST	HG HU WĀ KA KH KO IM ST	 HU WĀ WS KO ST	 HU WĀ KO ST	HG HU WĀ WS KA KH KO IM TU AH ST	HG GP HU WĀ KA KH KO AH ST	HG TA HU WĀ KA KH KO ST

Key:

AH	Aho GP Games & Play
HU	Hui
KA	Karakia
KO	Korero/Conversation
ST	Storytelling
TU	Tutu
WS	Waiata/Songs
HG	Hunting & Gathering
IM	Immersion
KH	KapaHaka
NR	No Response
TA	Tangi
WĀ	Wānanga

All but one participant identified hui and wānanga as very significant activities for transferral of such knowledge, but within those even more significant was storytelling within and around the korero or conversation during hui and wānanga.

Practical activities, such as Hunting and gathering still featured as being important activities, but were not considered as important in the context of active knowledge transferral.

9.7.9 Content

Identifying participants' descriptions of teaching content is useful in helping this research understand and identify the teaching purpose within the activities themselves, in the transferral of knowledge relating to interactions and relatedness with the environment.

The key themes emerging from this subsection illustrate that priorities for lesson content are whakapapa and whanaungatanga, useful knowledge, tikanga and developing learners' capacity to select and use knowledge critically, engaging learning preferences

Table 37: Content

Participant	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14
Content & Activities	NR	WH IR LC V A R K UK TK T? LS	WH IC IR LR LSU V A R K UK TK LS	WH IC IR LR LC LSU V A K UK TK CK T? LS	WH IC IR LR LC LSU V A K UK TK CK T? LS	WH IC LC LSU V A R K UK TK T? LS	WH IC IR LR LC V A K UK TK PS	WH IC IR LR LC LSU V A R K UK TK CK T? LS	WH IC IR LR LC LSU V A K UK TK T? LS	WH IR LR LC LSU V A R K UK TK LS	WH IC IR LR LC LSU V A K UK TK CK T? LS	WH LSU V A K UK T? LS	WH IC IR LR LC LSU V A R K UK TK T? LS	WH IC IR LR LSU V A K UK TK T? LS

Key:

A	How to listen & speak	CK	'Chewed' Knowledge
IC	Inter-Connectedness	IR	Inter-Relatedness
K	How to do / practice	LC	Learn how to Consider
LR	Learn how to Receive	LS	Life Skills
LSU	Learn how to select & Use	NR	No Response
PS	Play Skills	R	Read & 'Rite
T?	Tikanga	TK	Traditional Knowledge
UK	Useful Knowledge	V	How to Observe
WH	Whakapapa		

Almost all prioritised inclusion of whakapapa with awareness and appreciation of inter-connectedness and inter-relatedness as key lesson content for transferral. Most participants also prioritised useful knowledge, tikanga and developing learners' capacity to select and use knowledge critically (Royal, 2007), engaging communication and learning preferences effectively.

9.8 Why transfer of knowledge in this way?

Identifying and understanding why facilitators informed by Māori culture describe the process of transferral of knowledge as they have in this research may help identify pedagogical understandings that are different to perspectives informed by mainstream Western perspectives. Pedagogy informed by different philosophical understandings may provide

perspectives of gaps in mainstream Western EE/EfS epistemology and pedagogy that might not otherwise be identifiable or understood.

Six themes have emerged from this subsection illustrating rationales for individual pedagogy to be based on combinations of experience, tikanga, intuition or wairua, 'common sense', education theory.

Table 38: Why transfer of knowledge in this way?

Participant	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14
Content & Activities	NR	WW ET TK AAN CS	WW TK I/W	WW TK AAN I/W	WW ET TK AAN CS	WW ET AAN I/W	WW TK	ET TK AAN I/W	WW TK CS	WW TK I/W	WW	WW TK AAN I/W CS	ET TK I/W	WW TK AAN I/W CS

Key:

AAN	Assess & Address Needs	CS	Common Sense / Practical
ET	Education Theory	I/W	Intuition / Wairua
NR	No Response	TK	Traditional Knowledge
WW	What Works vs. What doesn't Work		

Most participants explained that their approach or pedagogy is based on what they have experienced as working with a particular type of person and/or situation as against what they believe is unlikely to work or they have experienced not working.

Most participants included tikanga as an approach that either they had experienced as working or was a cultural protocol to be adhered to.

Over half of the participants described basing their decision of what approach to engage upon intuition or wairua.

Several participants described their selection of approach or pedagogy as being based upon common sense.

Several other participants described their selection of approach or pedagogy as being based upon teaching or education theory.

Most participants described a combination of at least three of the six rationales.

9.9 Chapter Summary

The results of this chapter have been presented in eight sections. This section of the chapter will present a summary of findings.

In the process of summarising the findings it has become apparent that five further themes, reflecting epistemological and pedagogical aspects of the data, are in evidence. These five themes lie in order of the occurrence in the findings and have been demarcated using braces.

It has been found in Section 3 of this chapter that in perspectives informed by Māori culture:

- respect, value and maintenance of mātauranga is a key set of knowledge for transfer or dissemination and that the process of transfer and evolution of knowledge itself is an important part of mātauranga;
- whakapapa is both a key set of knowledge and a mechanism for transferral and maintenance of cultural knowledge, including inter-connectedness, inter-relatedness and inter-dependence;
- whakapapa is also important for the development and maintenance of individual and community senses of identity, place, belonging, context, purpose and direction;
- whanaungatanga is an important knowledge for transfer to understand, respect and maintain relatedness and relationships;

Whakapapa and Whanaungatanga (Interconnections and Relationships)

- rather than a particular knowledge set, optimal development and well-being of individuals to individual potentials is an important goal, requiring combinations of individual and/or integrated approaches to facilitation;

- 'life-skills' are a key set of attitudes, values and skills for transfer for individuals and communities to keep safe (in a holistic sense), survive with integrity, be well and continue;

- male knowledge and female knowledge are distinctive and, when acknowledged and combined, afford balance;

- community values and skills in working together (rōpūtanga), including communication, collaboration and cooperation, are an important knowledge set for transfer.

The key finding of Section 4 of this chapter is that in perspectives informed by Māori culture, it is more important for a facilitated activity and its context to be relevant, practical, meaningful and engaging than to be in a particular place to be most effective in transferring knowledge.

It has been found in Section 5 of this chapter that in perspectives informed by Māori culture:

- transfer of knowledge and life-skills occur most effectively through life experience and events, particularly during childhood, and;

Self-identity, Self-well-being, Self-potential

Survival Skills

Community Well-being

Transferral / Pedagogy

- learning occurs (or not) according to learners 'readiness', whether through circumstantial or facilitated opportunities.

Section 6 of this chapter finds that in perspectives informed by Māori culture, while kaumātua, kuia and family members are key facilitators in the transfer of knowledge, everyone is a teacher and everyone is a learner.

Section 7 of this chapter has addressed how knowledge, values and skills that facilitate a Māori cultural conservation ethic equating to EE/EfS are transferred through eight subsections. It has been found in Section 7 of this chapter that in perspectives informed by Māori culture:

- communication and learning preferences described are visual, aural/oral, and kinaesthetic or VAK (Fleming and Mills, 1992) (see 9.7.1);

- the key role and aim of facilitators is guiding and facilitating learning through critical thinking, but sometimes informing;

- facilitation of learning 'as' or 'as part of' the environment, as well as in' and 'for' the environment (Lucas, 1979), leading by example in one to one situations, using flexible and adaptive approaches, is most effective for transfer of knowledge and life-skills;

- there is a tension in integrating Māori cultural and Western cultural philosophies and approaches;

- whakapapa, connectedness and storytelling linked with practical, proactive, confronting and meaningful activities

as key methods of engaging learners for transfer of knowledge and life-skills;

- passage of time holds little meaning, yet timing of knowledge transfer is considered very important;
- whakapapa, storytelling and ensuring meaningful context are effective pedagogical tools for imbuing qualities key in developing life-skills;
- informal, nature-based and/or home settings that incorporate cultural and spiritual aspects are most effective for transfer of knowledge transferring life-skills;
- Storytelling associated with hui and wānanga are most effective for transferring knowledge that underpins cultural understanding and life-skills.

Section 8 of this chapter has found that pedagogies of the facilitators of the transferral of knowledge, values and skills informed by Māori culture in this research were based on combinations of experience, tikanga, intuition or wairua, 'common sense' and, in some cases, education theory.

9.10 Chapter Conclusion

The focus of this chapter has been to investigate participants' understandings and approaches informed by Māori culture for facilitating a transfer of knowledge to help imbue a cultural conservation ethic that equates to EE/EfS. This purpose tests a theory posed in the conclusion of Chapter 8 and developed subsequent to the previous chapter's findings, that such investigation may reveal embedded epistemology and pedagogy that will inform the purposes of this research. Three significant findings contributing to the purpose of this thesis have arisen from this chapter. These will be

briefly described and discussed here in order of least relevance to most relevance in terms of this chapter's purpose.

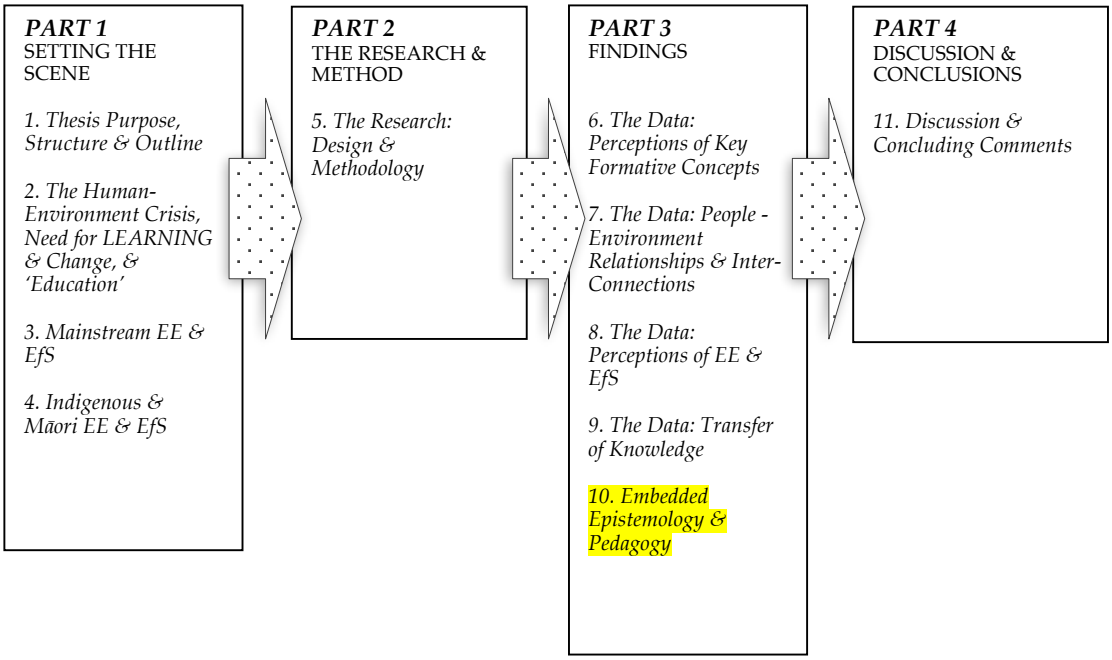
Firstly it has been found that there is a tension in integrating Māori cultural and Western cultural philosophies and approaches (see 9.7.3). This finding is consistent with the literature (see such as Williams, 2004) and is significant to the outcomes of this research given contemporary EE/EfS literature (see such as Chapman & Eames, 2007), seeks meaningful integration. The implications of this issue will be considered in the discussion of Chapter 11 of this thesis.

Secondly, the finding of facilitation of learning 'as' or 'as part of' the environment is persistent with findings in Chapters 6 and 7. This holistic perspective and understanding contributes a deeper philosophical perspective and added dimension than that of mainstream Western or alternative for educational epistemology, pedagogy or curriculum to any identified in this research's review of the literature. This finding may be an example of a consideration or view point that is not possible from an anthropocentric-technocentric frame of reference, but which is perhaps rudimentary within a holistic perspective, and so key to conceptualising and achieving a shift in paradigm. It is representative of a holistic epistemology. As such, this is a significant finding for the purposes of this research. The potential ramifications of the emergent perspective of 'learning as' or 'learning as part of' the environment will be further considered in the context of the purposes of this research in Chapter 11.

Thirdly, the results of this chapter as presented in the Summary section above are persistent with the suggestion in the conclusion of Chapter 7 of this thesis of indications of an intrinsic educational philosophy and pedagogy interwoven and embedded within the results. Five epistemological and pedagogical themes have emerged in the process of preparing the chapter summary of this chapter, which appear to substantiate such early speculation. There appears to be an identifiable intrinsic holistic epistemology and pedagogy for EE/EfS embedded in Māori cultural perspectives, understandings and practices. An appropriately focused analysis of the data

in the context of the five themes that have emerged from this chapter will investigate this in the following chapter.

10.0 THE DATA: Embedded Epistemology & Pedagogy



10.1 Introduction

The purpose of this chapter is to frame the interview data and findings of this research within the context of five epistemological and pedagogical themes that emerged from the preceding chapter, to investigate whether or not their combination represents or reveals a cohesive epistemological and pedagogical framework for EE/EfS embedded in Māori culture.

A grounded theory methodology has been used to gather and analyse data in this research (see Chapter 5). The data and results of the preceding chapters indicate an intrinsic epistemology and pedagogy for EE/EfS embedded in Māori culture. Chapter 6 found that descriptions by participants in this research and in the literature (see such as Royal, 2007) of the objectives of 'education' and learning informed by Māori culture appear to juxtapose the key objectives of mainstream Western EE/EfS. The data and findings of Chapter 7 illustrate an embodiment within perspectives informed by Māori

culture amongst participants in this research of critical understandings of inextricable inter-connectedness, inter-relatedness and interdependence. This embodiment and perspective has been described in the literature as a pervasive conservation ethic within Māori culture (Davis, 1991; Williams, 2004) and as being largely absent amongst mainstream Western worldviews (see Coyle, 2005). Chapter 8 found that the terms 'environmental education' and 'education for sustainability' have little meaning or application in most participants' understandings, who had no knowledge of a parallel construct or practice within Māori culture as articulated by the participants in this research. The attitudes, values and behaviours sought as outcomes of mainstream EE/EfS are understood by participants, and indeed appear through the data, to be associated with " . . . being 'Māori' as tāngata whenua" (Zack Makoare). The findings of Chapter 9 have included an emergent perspective informed by Māori culture as articulated by my participants of living and learning 'as' or 'as part of' the environment, as well as identifying the five epistemological and pedagogical themes that are the focus of this chapter.

In this chapter, epistemological and pedagogical objectives, outcomes and methods from the participant interview data are grouped under the five core values and themes identified as a finding of Chapter 9. The first four key themes relate to outcomes described as being sought by each participant in this research as the facilitator and/or learner. These are:

- Interconnection and Relationships - Whakapapa and Whanaungatanga;

- Self-Identity, Self-well-being and Self-Actualisation - Mōhioake, Hauoratanga and Atuatanga;

- Survival Skills – Tū Motuhake;

- Community Cohesion, Community / 'Resource' Well-being - Whakawhanaungatanga, Rōpūtanga and Kaitiakitanga.

The fifth theme relates to tools, approaches, applications and process involved in the transferral of knowledge. Two sub-themes are evident within the fifth theme: tools, approaches, applications and process that are identifiable within objectives of mainstream Western EE/EfS described in the literature; and tools, approaches, applications and process that arise from perspectives and understandings informed by Māori culture. The fifth theme and two sub-themes described in this chapter are:

- Transferral and Continuance
    - Mātauranga Māori / Tikanga Taiao
    - Elements of Core EE/EfS Goals.

The following sections of this chapter will describe the philosophical and pedagogical objectives associated with each of these five themes as reflected in understandings and approaches informed by Māori culture as sourced from the participants interviewed in this research. The order of presentation follows the flow that has emerged in the results and summary of the Chapter 9 which, upon revisitation as part of the analysis for this chapter, is notably reflected in the links and flow of information provided by participants in the interview data.

It has been found in the process of thematic analysis and then organisation of this chapter that clear categorisation of subthemes is difficult. The descriptions in the interview data from participants of role, nature and function of many if not all of the themes, subthemes and categories inter-connect, inter-relate and interchange. Many if not all of the themes described by participants in interviews and subsequently tabulated for analysis in this research, might all at once be considered objectives, outcomes, tools, approaches, content, applications, processes and activities in the context of these five themes. For example, whakapapa has been described by almost all participants throughout the interview data of this research as an objective for and outcome of transfer of knowledge, while also an approach to, tool for, topic, activity and process in and core content of the learning. Accordingly the subthemes might be grouped appropriately in a variety of ways. Their grouping in this chapter and section illustrates their most relevant placement

as interpreted by the researcher in terms of the themes that have emerged. The implications of this observation will be considered in the discussion section of this chapter.

10.2 Inter-connections and Relationships - Whakapapa and Whanaungatanga

This theme is about imbuing understanding of the inextricable connection, relatedness and interdependence of all, and the craft of establishing awareness of and maintaining healthy relationships through developing learners' awareness, knowledge and understanding of their inter-connection and relationships with te taiao (all that is in the now – [in some interpretations including all that has been and will be]) through whakapapa (relatedness through genealogy) and whanaungatanga (value of relationship, connection and commitment - Hirini, 1997, p. 44). This was the dominant goal-oriented theme evidenced in participant responses, recurring throughout the data and inter-relating with all other themes.

Table 39: Epistemology/Pedagogy: Whakapapa / Whanaungatanga / Connectedness / Relatedness

Participant	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14
Whakapapa / Connectedness/ Relatedness	NR	WH C PPF RT S/W	WH C RT S/W GG	WH C PPF RT S/W	WH C PPF S/W	WH C PPF RT S/W	WH C RT S/W	WH C PPF RT S/W	WH C RT S/W	WH C PPF S/W	WH C RT S/W	WH C PPF RT	WH C PPF RT S/W	WH C PPF RT S/W

Key:

GG	for the Greater Good	PPF	Past/Present/Future
NR	No Response	RT	Respect
SW	Spiritual / Wairua		
WH	Whakapapa – knowing who & what you are & where you stand & inter-relationships		

Interview data from all but one participant reflects heavy emphasis upon whakapapa/relatedness and connectedness and whanaungatanga/relationships of te taiao (all that is) as critical objectives of the transferral of knowledge because "we arrive at everything that we know through all that whakapapa" (Dr. Hauiti Haukopa). For example:

. . . everything that you do has some sort of connection along the way to an ancestor, and of course that's what it is about for us.

(Matua Hori Parata)

and:

We whakapapa to the earth, we connect to the Earth. And it's not just the fact that we were born and constructed out of the Earth, you know, we relate to the earth, we connect to the Earth in the way we do things. You know, the places we visit and the way we bury our dead and the way that we talk about the land and the stories that it records for us.

(Dr. Hauiti Hakopa)

All but one participant expressed concern in terms informed by both Māori culture and mainstream Western culture at the " . . . state of the whenua and Tāne's children and the children of Tangaroa, our community and our people" (Zack Makoare). Most participants described a related objective responding to their perceptions of increasing disconnection or forgetfulness of connection, and of relatedness and relationships with te taiao amongst their communities and in mainstream Western society:

I think we've fallen into a way of thinking and being in the world that leads us to believe that we're separate. So I'm separate from you, I'm separate from the Earth and I'm separate from the white middle class people that I talk about sometimes, or tāngata whenua that I talk about, but in reality we're all connected and there's that common strand that goes through everything and all of it. So anything that we do ourselves impacts everybody else and everything else in creation. And that is quite a powerful idea to try and come to grips with when you consider how much is in creation as we know it. So for me when you are talking about the environment, you need to be helping people to remember.

(Dr. Pip Pehi)

Many participants described an appreciation and embodiment of inter-connection as an objective because " . . . that interconnection, that 'one-ness'

with Tangaroa in a spiritual sense, as true kaitiaki of Tangaroa, as kaitiaki of the whenua, is key to holistic well-being" (Zack Makoare).

> *Being Māori as tāngata whenua is being as one with the land. To learn or remember and relearn what it is to be tāngata whenua, the people - Māori or Pākehā – need to return to the conversations, relationships and interactions with the land, with each other and with themselves.*
>
> (Matua Hori Parata)

The importance of whakapapa and whanaungatanga as an underpinning and inter-connecting set of knowledge and objective for learning was evident in the way some participants' explained them, such as with the theme of self-identity, self-well-being and self-actualisation:

> *Knowing and understanding one's own whakapapa helps a person know who they truly are, how they came to be, why they are as they are, 'where they stand', their place and their potential to become 'atua' – to be more than 'human'.*
>
> (Dr. Hauiti Hakopa)

All but one participant emphasised whakapapa as a critically important objective for learning in terms of self-identity, sense of place, sense of belonging, sense of purpose, caring and motivation " . . . being able to contribute to the community" (T2).

The need to convey understanding and embodiment that all actions have consequence, was also emphasised by most participants as crucial for learning for life:

> *It's about accepting what is. And the basic 'what is' is that we are related, we are indivisible from what goes on around us: we are indivisible from the people, we're indivisible from the natural world, we're indivisible from what goes on in the spiritual world . . .*
>
> (Dr. Pip Pehi)

Whakapapa was explained by many participants (9/14) as the main means or mechanism of instilling awareness, understanding and respect of and maintaining, an inextricable link between past, present and future.

> *In considering and understanding what our futures may hold, it is first necessary to consider and understand the now and, before the now may be considered and understood well, it is necessary to look behind and understand in detail what has gone before.*
>
> (Abraham Witana)

Whakapapa, with its geographically related traditional stories or songs or chants, was explained by many participants to hold the key to understanding events in the past that explain what is likely to happen and what to do in the 'now' or future should signs of such events occur. Dr. Hauiti Hakopa explained that:

> *. . . the opportunity to not repeat the mistakes and benefit from the learning and wisdom of our ancestors exists, should we choose to seek, recognise and accept the lessons imbued through whakapapa.*

Accordingly, regular visitation and exposure to various whakapapa and whanaungatanga as part of daily routine, such as through or with karakia and tikanga, was explained as a crucial mechanism to help people understand, be perpetually reminded of and embody the interdependence of their own being, health and comfort with the inter-relationships and inter-connections of what is around them. It was suggested that " . . . a deep appreciation and respect of life, self and all that is developed in these ways" (Dr. Hauiti Hakopa). For example:

> *I've been teaching our children around having a small karakia when we are near Tangaroa. What that brings is around a protection of understanding and valuing and a commitment to understanding the dangers in true sense of 'being one' with Tangaroa. So from that in safety area you think about what is Tangaroa is about and consider and respect and <u>value</u> Tangaroa more than you have in the past. You remember to never turn your back on Tangaroa and*

always count the waves, remembering that that seventh wave is always the big one. You learn that that will be the tongue of Tangaroa that reaches out to claim the disrespectful.

(Zack Makoare)

Most participants (12/14) made reference to wairua and spirituality, and described the understanding, respect of and competence in interacting and maintaining connections and relationships in the context of spirituality and/or wairua as an important awareness, connection, competence and life-skill which " . . . requires active protection and passing on" (Linda Faulkner).

If we were to be living on the Earth, not as detached or separate as our technology 'distanced-interferenced' life is now, we would need at very least some key people in our communities to have the abilities to access those worlds and access that wairua knowledge. Because that comes back to the whole concept of Mātauranga Māori and remembering our connectedness and our potential to 'be' and be well.

(Dr. Pip Pehi)

Almost all participants (13/14) included whakapapa as an important means of maintaining and perpetuating knowledge, history and links with identity and cultural knowledge:

. . . it is whakapapa and karakia and waiata that reminds our people every day, and that maintains the knowledge of mātauranga and the connections in here [gesturing to head] and here [slapping chest] as part of here [gesturing around the landscape] and there [gesturing to his maunga / ancestral hill].

(T14)

Many participants (11/14) linked whakapapa and relationships directly with a goal of developing individual identity, well-being and development, " . . . ultimately towards maturity . . ." (Zack Makoare). Dr. Hauiti Hakopa explained this process:

. . . is about 'tupu.' My father's always talked about us as trees – not pine trees but tōtara nurturing our mokopuna and rangatahi like trees, so they need

to take their place in the sacred forest. Boom! So we grow them like that. And one day becoming a mature tree in the sacred forest; a great tōtora; and then perhaps through that atuatanga we talked about, that's about one's potential . . . to learn that knowledge, that wisdom and become 'more than human'.

The extension of whakapapa as an objective in terms of understanding and respecting cultural perspectives of relatedness to being an objective associated with holistic well-being of the individual illustrates the clear cross-overs and interconnections between all four themes that are apparent in almost all interview data from participants.

10.3 Self-Identity, Self-well-being and Self-actualisation / Mōhioake, Hauoratanga, Atuatanga

This theme addresses equipping individuals to know oneself, one's basic needs and how to meet them, capabilities, strengths, weaknesses, and limitations, as well as current condition in balance with individual needs, whanau needs and community needs. Key outcomes of this theme are values, ethics, respect and integrity through an ultimate goal of true self-knowledge, self-well-being and self-actualisation (Maslow, 1973). These may be described (in order) as mōhioake, hauoratanga and atuatanga.

Table 40: Epistemology/Pedagogy: Mōhioake/ Hauoratanga / Atuatanga / Self-Identity / Self-Well-being / Self-Actualisation

Participant	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14
Identity / Self Well-being	SI	SI SK SE SW As	SI SK SW As	SI SK SW As	SI SK SE SW AT As	SI SK SE As	SI SK SW As	SI SK SW AT As	SI SK SE SW As	SI SK SW As	SI SE SW	SI SK SE SW As	SI SK SE SW AT As	SI SK SW As

Key:

As	As one with / part of the Environment	AT	to become Atua
SE	Self-Esteem/Self-worth	SI	Self-Identity
SK	Self-Knowledge	SW	Self-Well-being

Almost all the interview data from participants (12/14) linked whakapapa and relationships directly with a goal of developing individual identity, well-

being and development, as well as self-knowledge and " . . . one-ness" (Zack Makoare). Participants explained that, while such things are all inter-connected this particular link is important because "you've got to know yourself to know your environment" (Te Moengarau Hemopo) and " . . . understand that we're a small part, . . . an important part, . . . of te taiao" (Abraham Witana). For example:

> *Instilling that well-being that comes from knowing and understanding and respecting oneself - that only truly comes from understanding that connection with and respect for everything else - being as one – that can only come from truly knowing oneself: learning and fully understanding what is needed and what it is to be alive and well, and respecting that in yourself and others. The mauri. And that's in the whakapapa and the kaupapa Māori and mātauranga and the tutu.*
>
> (Zack Makoare)

Most participants (12/14) described an objective for learners to understand that the well-being of the individual reflects the well-being of the community and its people, who are directly linked and a reflection of the well-being of the land, and vice versa. For example:

> *It was reinforced for people at the wānanga awa that the river doesn't just exist in our rohe, but actually its literally part of who we are, hence the proverb 'I am the river and the river is me' . . . There's a direct connection there because we have the river flowing through our veins, so if the river's unwell, we're unwell and vice versa.*
>
> (Linda Faulkner)

Almost all participant interview data (12/14) described objectives of transfer of knowledge needing to impart understanding of humans living and learning 'as' or 'as part of' te taiao. "Looking after the holistic environment should be understood to be looking after ourselves, looking after our whanau - family and community . . ." (Zack Makoare) because " . . . we are the environment in which we find ourselves . . . [and] . . . basically if the natural environment is paru (fouled), we will be paru" (Dr. Pip Pehi).

All participants (14/14) described an objective of the development of a sense of identity attached to place, family, relations, structures, land, nature, rivers, lakes, hills, mountains, forests and all their inhabitants, " . . . and all of those are related by whakapapa and are ancestors, connected with a story . . ." (Rawinia Puna) concurrent and interwoven with the learning of whakapapa and whanaungatanga.

Several participants suggested an objective of individual interests and attributes should be identified and developed through the transfer of knowledge, " . . . so that strengths can be brought out and honed . . . and the 'not so goods' humbled . . . and self-esteem built with self-worth and self-belief . . ." (T2). Four participants similarly articulated an objective to " . . . develop people at what they are naturally good at, to benefit them as one part of a community. And ultimately that community is a strong one that is aware, capable yet humble" (T14).

10.4 Survival Skills – Tū Motuhake

This theme is about equipping learners so that basic needs may be met for survival, well-being and continuance through mātauranga Māori. It involves the facilitation of knowledge, understandings, values, ethics, skills and practices that equip individuals so that they are capable of caring for and providing for themselves, for direct family and for the community, and for adapting cooperatively to change. Interaction with the other themes is implicit.

Table 41: Intrinsic Epistemology/Pedagogy: Tū Motuhake / Survival Skills

Participant	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14
Survival Skills		SWI SU MC P LS TC	P LS ECA	SWI SU MC P LS	SWI SU MC P LS TC ECA	MC P LS TC	SU MC LS ECA	SWI SU MC P LS TC ECA	SU MC P LS	SWI MC P LS TC	SU MC P LS	MC LS TC ECA	SU MC P LS TC ECA	P LS

Key:

ECA	Environmental Contextualisation / Adaptability		
LS	Life Skills	MC	Meaningful Context
P	Practical	SU	How to live ecologically 'Sustainably'
SWI	Survival With Integrity	TC	Thinking Critically

Almost all participants (13/14) described life-skills as a core set of knowledge values and skills to be transferred as part of learning as part of the environment and imbuing a conservation ethic. 'Life-skills' described by participants are a combination of awareness, knowledge and understanding of relationships and connections that support the development of attitudes, values and relevant practical ability, critical qualities and skills for survival, well-being and community life. For example, objectives described by participants during interviews in this research (or summarised for the purpose of inclusion in this section), included:

- " . . . understanding connections and relationships" (T2);
- environmental sensitivity, awareness, literacy and competence (Abraham Witana), and;
- the ability to adapt to different contexts to survive (Hinemoa Ngatai);
- " . . . how to survive and carry on with integrity . . ." (Matua Hori Parata);
- " . . .knowing who you truly are" (Dr. Hauiti Hakopa);

- “ . . . karakia and how to ‘be still’ . . .” (similar concept to meditation) (Dr. Pip Pehi);

- “ . . . connect with wairua sources . . .” (Linda Faulkner);

- “ . . . how to find good water, stay warm and how to find food” (Chris Holtham);

- “ . . . know the whakapapa, the stories and the songs . . .” (T14),

- “ . . . be able to have true conversations with the Earth” (Zack Makoare);

- “. . . trusting your instincts . . .” (Te Moengarau Hemopo);

- “ . . . how to ask questions, think critically and learn” (Tui Shortland)

- “ . . . rōpūtanga – communicating, collaborating, co-operating . . . [and] relating together as whanau, hapu iwi and as a community” (Rawinia Puna)

10.5 Community Cohesion, Community / ‘Resource’ Well-being

Whakawhanaungatanga, Rōpūtanga and Kaitiakitanga

This theme concerns the transferral and development of a sense of community and of one’s place, role and responsibilities as part of a co-operative, resilient and ‘well’ community. It is about community cohesion, well-being and strength through qualities, connections, relationship, inclusion, responsibility, communication, collaboration, cooperation and adaptability of whanaungatanga and community through whakawhanaungatanga (the practice and ways of developing and maintaining relationships) and rōpūtanga.

Table 42: Intrinsic Epistemology/Pedagogy: Whakawhanaungatanga / Rōpūtanga / Kaitiakitanga / Community / 'Resource' Well-being:

Participant	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14
Community Strength & Well-being / Rōpūtanga	M	WN WT WB M T	CCC WN WT WB M T	WN WB M T	CCC WN WT WB M T	WB M T	WN WT WB M T	CCC WN WB M T	WT WB M T	WN WB M T	WT WB M T	WN WB M T	CCC WN WT WB M T	WN WT WB M T

Key:

CCC	Communication/Collaboration/Cooperation		
M	Mātauranga Māori/Traditional	WB	Well-being
WN	Whakawhanaungatanga	WT	Working Together/Rōpūtanga
T	Tikanga & Ethics		

Interview data from all participants in this research identified mātauranga Māori and traditional knowledge as critical objectives for the transferral of knowledge because " . . . in a taha Māori way, it is all about looking after the people and the whenua, to look after te ao marama. One thing that's for sure is we need to protect the mauri of the land and everything to do with land; otherwise we are not going to survive as part of all that" (Dr. Hauiti Hakopa).

Most participants (13/14) described the parameters established and maintained through tikanga and integrity or ethics, as being very important aspects of Māori culture to be transferred and developed for a cooperative community to survive, be well and continue. For example:

> *We as Māori knew all of these resources had a limit, and we had to ensure that, within our tikanga, those limits were always going to be there because we wanted to be able to pass on the taonga that we had, or that we have in our times now, for our children's children's children. We were always looking, or our tupuna were always looking a hundred years ahead of their time to make sure that a resource was always going to be there. It used to be that tikanga o te taiao, tikanga o te moana, tikanga o te ngahere, were always followed. And that was a tool, or <u>the</u> tool that was used to manage the people in accessing the resource to ensure that the particular resource was there for evermore.*
>
> (Abraham Witana)

Whakawhanaungatanga was also described in principle by participants (10/14) as being an important life-skill for transfer so that social and cooperative skills, including " . . . communication, collaboration and consensus . . . " (Rawinia Puna) can be instilled as principles of rōpūtanga towards best possible outcomes for the whole community, " . . . including for the domains of Tangaroa, Tane, iwi, hapu and for future generations" (Zack Makoare). Such focus is advocated in the literature as objectives for a cooperative, resilient and sustainable society (see such as Campbell, 2001; Cullingford, 2004; Simmons; 2008). An example from the participant interview data of this research is:

> *It's about the people around you and, to work with them, it's about inter-dependence. I could be completely independent, but I wouldn't have the same quality of life as somebody that was inter-dependent, that had a lot of people around them that love them. I look at the people that I have around me and I make sure that they are people that I want around me. Life-skills are about nurturing those relationships by doing things like showing gratitude, by being able to provide for them and share my mana with them. And help them when they need it.*
>
> (T2)

Almost all participants (13/14) described an objective of community well-being. Most participants described an interdependence of community well-being upon the collective competence and well-being of the individuals that make up that community.

> *It is in our people's interest for our rangatahi to be fit and strong and in tune with themselves, and in tune with all the realms of the world. Hauora. Well-being. It used to be talked about as 'whare tapa wha' – Mason Durie described it as that - the holistic well-being of a person - 25-30 years ago. That sort of thing. Strong, well, knowledgeable and capable people make up a strong, well, formidable community, eh?*
>
> (Zack Makoare)

Several participants in the interviews described modelling of attitudes, values and behaviours as a combination of important objectives, content and approach for transferral, which illustrates the inter-connectedness and inter-relatedness of these five themes. An example of this was the inclusion in interview data of all but one participant in this research of tikanga as core material for transfer. For example:

> *So in the sense of this 'sustainability', it's something we've always done, but somebody's gone and put a label on it. What you're having is you're having a group of non-Māori saying there's an issue there – 'there's a raping of the kaimoana and there's gonna be nothing left at this rate for your moko if we don't do something about it now'. That idea is not new: it's what our tupuna have taught us as kaitiaki, and theirs before them. In the tikanga. It means being in touch with the pipi beds, forwards-looking and saving for tomorrow. Saving for my moko's moko. Doing something today so that my moko has an opportunity to do something that I did, so they can work the same land that their nanny worked in, as I do now when I go home. When I get back onto my island I take a step off that barge, I walk up that pathway to my house, and that's the same road my nanny walked on. And I think 'one day my moko are gonna walk up this same road. I need to look after this road.' So it's looking after – what I do today looks after tomorrow, with a flow on effect. That is what we do.*
>
> (Hinewai Ngatai)

The preceding sections have described four themes that address objectives or desired outcomes of a transfer of knowledge, values and skills equivalent to mainstream EE/EfS informed by Māori culture as articulated by the participants in this research. The following section and theme will present descriptions of objectives, tools, approaches, content, applications and processes indicated in participant interviews as mechanisms for transferring and continuing a Māori cultural conservation ethic.

10.6 Transferral and Continuance

This theme encompasses the theoretical and practical mechanisms by which objectives and outcomes of knowledge, values and skills core to a Māori cultural conservation ethic are achieved, as described and evidenced in participant interview data of this research.

Two subthemes are apparent in the data resulting from interviews of the participants in this research describing tools, approaches, applications, processes in transferral of knowledge, values and skills as informed by understandings of Māori culture evidenced in interviews by the participants in this research. One subtheme describes elements attributed to formative mainstream Western descriptions of what EE/EfS needs to be and needs to impart are represented in the interview data. A second subtheme addresses approaches, applications, and processes that appear to stem from perspectives informed by Māori culture as articulated by my participants.

Methods, tools and approaches described or otherwise evidenced by participants in the interview data of this research as being engaged for the transfer of knowledge have been presented in the preceding chapter (see Sections 9.2 to 9.8). Rather than describing these again, this section will report findings indicative of epistemology and pedagogy revealed through analysis of the interview data of this research.

10.6.1 Transferral and Continuance: Elements of Core EE/EfS Goals

The interview data of all participants included some element or aspect of tools, approaches, applications and/or process in transferral of knowledge, values and skills that reflect or represent elements of mainstream Western understandings and approaches to EE/EfS.

Table 43: Intrinsic Epistemology/Pedagogy: Elements of Core EE/EfS Goals:

Participant	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14
Elements of Core EE/EfS Goals	AW K I About EA EC	AW K C A/V S I G In About For EA ES EC EL R	AW K U C A/V S I F In About For EA ES EC EL SP R	AW K U C A/V S G F In For EA ES EC EL	AW K U C A/V S G F In For EA ES EC EL SP	AW K U C A/V I G F In About EA ES SP R	AW K C A/V S F In About For EA ES EC EL	AW K U C A/V S G F In For EA ES EC EL SP R	AW K U C A/V S G In About For EA ES EL	AW K C A/V I G F In For ES EC EL R	AW K U C A/V S I G In About For ES	AW K U C A/V S I F In For EA ES EC EL	AW K U C A/V S G F In About For EA ES EC EL SP R	AW K U C A/V S I G F In About For ES EC EL

Key:

AW	Awareness	About	About the Environment
A/V	Attitude & Values	C	Connection
EA	Environmental Awareness	EC	Environmental Competence
EL	Environmental Literacy	ES	Environmental Sensitisation
F	Facilitation	For	For the Environment
G	Guidance	I	Information
In	In the Environment	K	Knowledge
R	Read / Write	S	Skills
SP	Shifting Paradigms	U	Understanding

The participant interview data included descriptions of learning being 'informed, guided or facilitated' (see Coyle, 2005) 'in, about and for' the environment (Lucas, 1979) towards developing 'awareness, knowledge and understanding, attitudes, values, skills and participation' (Ministry for the Environment, 1998, p. 10-11; UNESCO-UNEP, 1978), as well as environmental sensitisation, awareness, literacy and competence (see such as Coyle, 2005; Orr, 1990, 1992a, 1992b; Scholz, 2011) and to shift mainstream paradigms to holistic positions (such as Stables & Scott, 2002).

The details of the analysis regarding these methods, tools and approaches has been presented in Section 7 of Chapter 9 of this thesis. The table above (see Table 30) presents a summary of the data presented in Section 9.7 of this thesis relating to this subtheme.

10.6.2 Mātauranga Māori / Tikanga Taiao

The themes in this subsection describe tools, approaches, applications and/or process arising from Māori culture as described and evidenced in participant interview data of this research in transferral of knowledge, values and skills by which a Māori cultural conservation ethic is imbued. These themes are illustrated in the table below (Table 44). As for the previous subsection, the detail of analysis regarding these methods, tools and approaches has been presented in Section 7 of Chapter 9 of this thesis.

Table 44: Intrinsic Epistemology/Pedagogy: Mātauranga Māori / Tikanga Taiao / Transferral and Continuance:

Participant	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14
Transferral & Continuance		KP IS	IS ET	KP IS ET	KP IS ET	KP IS ET	ET	KP IS ET	KP IS ET	KP	IS	KP IS ET	KP IS ET	KP IS ET
	RM	RM AC		RM AC	RM AC	RM	RM AC	RM AC		RM AC	RM	RM AC	RM	RM AC
		FA WW LL HV	FA WW LL HV	WW LL	FA WW LL HV	FA WW LL HV	WW HV	FA LL HV	FA WW LL HV	WW HV	FA WW LL	WW LL HV	FA WW LL HV	FA WW HV
	CT	CW CT V A K DP	CW CT V A K	CW CT V A K DP	CW CT V A K DP	CW CT V A K DP	CT V A K DP	CW CT V A K DP	CW CT V A K DP	CW CT V A K	CW CT V A K	CW CT V A K DP	CW CT V A K DP	CW CT V A K DP
		swc	swc	swc	swc	swc	swc	swc	swc	swc	swc	swc	swc	swc

Key:

A	How to listen & speak	AC	Assessment on Competence
CT	Critical Thinking	CW	Community Well-being
DP	Develop a Position	ET	Everyone is a Teacher / Learner
FA	Flexible & Adaptable	HV	Whole Person Valued
IS	Individual Specific	K	How to do / practice
KP	Know Learning Purpose	LL	Learn how to Learn
RM	Relevant & Meaningful	SWC	Survival, Well-being and Continuance
V	How to Observe	WW	What Works vs. What doesn't

Many of the participants (11/14) in this research indicated through the data from the interviews that learners need to know and understand ". . . what that transfer of knowledge is about - what they are learning for" (Abraham Witana) for meaningful transferral of knowledge, value and skills to occur. In other words, learners should know the purpose of their learning.

Most of the participants (12/14) indicated in the interview data in this research that activities and content being transferred for learning " . . . needs to be relevant, meaningful and has to make a connection for that person in

order to be effective" (Linda Faulkner). Zack Makoare explained his perspective informed by that Māori culture that:

> *. . . making change is brought about through an open heart, not through the mind. You have to touch them and engage them and make it meaningful to them at a personal level. So they understand that they are connected and how, and know they belong and so are able to care. And then it's about relationship and doing together. We have drifted away by our education today being more about observing rather than doing. From being in tune. Or being true.*
>
> (Zack Makoare, his emphasis)

Many participants (10/14) articulated a perspective informed by their understandings of Māori culture that " . . . from the earliest part of your life, you learn how to learn and then you learn for the rest of your life" (Matua Hori Parata, his emphasis).

Most participants explained that what was learnt and how varies from community to community in context with local conditions and related needs, but that:

> *. . . in a taha Māori aspect it's about knowing what the rongoa are, or the healing plants, it's about knowing what the kai is, the mahinga kai, where we gather our food from; that's the stuff we teach our kids or our nephews and nieces: by taking them out onto the land to gather things. And they learn about how to use them and what to do with them.*
>
> (T2)

Almost all participants (11/14) described aspects of individuals being valued as ". . . a whole person . . ." (Dr. Pip Pehi) in terms of being: " . . . fit and strong and in tune with themselves, and in tune with all the realms of the world . . ." (Zack Makoare). Several participants interview data made reference to Durie's (1998b) 'whare tapa wha' model for holistic well-being in explaining perspectives informed by Māori culture as represented in the participants' interview data for this research to incorporate concern and

respect for the spiritual, mental, physical and relational dimensions of individual well-being. For example:

> *. . . our whole idea about growing our children is to grow them into strong trees: tōtara, haemata. You know, straight and being able to tread in this whole world. So I know my kids are pretty much ready to stand anywhere in the world. And they will never be lost.*
>
> (Dr. Hauiti Hakopa)

It was also explained in the interview data of many participants (11/14) in the interviews of this research that, in their understanding of Māori culture, individual strengths, weaknesses, attributes and talents are often most effectively addressed and extended through activities tailored or otherwise suited to extend and benefit particular individuals. A number of different mechanisms were described, some of which are illustrated in Section 7 of Chapter 9 of this thesis. Most participants emphasised " . . . the importance of focusing on traditional knowledge" (Tui Shortland).

Methods described include cultural immersion through " . . . a process of tikanga and ensuring that . . . [the learner] carr[ies] out things in the right manner and with respect to whatever it [is] that we [are] doing . . ." (T2). In this vein, many participants described cultural mechanisms that imbue and reinforce a range of attitudes, values and behaviours respecting interconnection, inter-dependence and relationships through their practice and associated meanings. For example, Zack Makoare explained some dimensions of ". . . many layers and effects . . ." that he understands develop over time as each individual matures through life, of the common practice of 'hongi' upon meeting another:

> *From a Māori perspective, how Māori if they're in tune with their environment, the hongi is about a celebration of the oneness of everything around them and it depicts that wisdom or knowledge that People like Pita Sharples and people like that have, that true understanding of the whakapapa with their environment whether its Tane, Tangaroa or whatever mātauranga or knowledge that they have. In Pākehā the shake hand is a really good gesture,*

> *but the hongi is the expression of true meaning of sharing between one another; the sharing of breath that celebrates the first breath of all life. Hands are embraced and the two foreheads meet and there is a moment of stillness and sharing the essence of life – how deep can that be? The meeting of minds, spirit, there are lots of concepts in this. It gives a greater meaning to how you greet someone, respect, true connection, aroha . . . there are lots of concepts there. But it's about reminding each other every day of that true connection, eh?*
>
> (Zack Makoare)

Approaches, methods and tools for facilitating, guiding and informing transfer of what has been learnt in the past can inform the present and be called upon in the future towards survival, well-being and continuance of the people. For example:

> *When our people, when our old people talk about how we are going to sustain ourselves into the future they think about land; as being the source of everything, as well as being our identity.*
>
> (Dr. Hauiti Hakopa)

All participant interview data included reference to or essence that the knowledge and skills that are passed on being " . . . proven knowledge, skills and wisdom of our tupuna, passed so that the people are best equipped for survival . . ." (Matua Hori Parata). This model appears to extend throughout participant's perspectives of 'the Māori approach' to all considerations and actions through mātauranga and kaupapa Māori in the interview data of this research.

The collective interview data from participants in this research illustrates that transferral of knowledge of subject matter, objectives, tools, methods and approaches, as well as their selection and implementation, occurs through personal experience and observations, cultural traditions, instinct and guidance in various ways not only by kaumātua, tupuna and forebears, but by all members of a community. "The concept of ako in te ao Māori . . . is a learning process but also implies that the teacher can become the student and

the student the teacher; and in fact that is actually the reality of things" (Dr. Pip Pehi). In other words, everyone is a teacher; and everyone is a learner and " . . . as learners, people learn how to go about passing that knowledge on to others" (Chris Holtham).

The interview data from several participants (10/14) in this research reasoned that learners having to themselves teach or pass on information to others is an effective way of clarifying and reinforcing knowledge for learners. " . . . by us teaching and understanding how we've learnt demonstrates a level of understanding and competence by way of practical and oral trial" (T14). Matua Hori Parata explained the benefits of such practice being that:

> *In the Western paradigm today you learn how to 'do' something; you learn how to become 'something'. And then what they have to prove that you can do it is that they give you a certificate of some sort. Whereas in pre-European times the 'learn' that I'm talking about in terms of mātauranga, was that you and your competence were assessed by all the Kaumātua, the Kuia and the Tohunga of the tribe, in that 'do you understand what you are doing?' and how to convey what you think you're doing to somebody else.*
>
> (Matua Hori Parata)

A few participants described such practices as being important mechanisms " . . . so that tikanga continues and that kaupapa, that mātauranga Māori, is maintained" (Dr. Hauiti Hakopa).

Several participants' interview data included descriptions of " . . . older kids looking after the young ones, taking them places – or bringing them back from a little tutu [laugh] . . ." (Te Moengarau Hemopo), as examples of how such practice continues within families with perspectives informed by Māori culture. The effectiveness of multi-level 'family' or whanau groups is well known and exhibited in the likes of the Waldorf/Rudolph Steiner (Oberski, 2011; Rivers & Soutter, 1996) approach to educational development.

Consistent with the results of Section 9.7.1 of this thesis, all but one of the participants' interview data reflect strong Visual, Audio/oral and

Kinaesthetic (VAK) learning and communication preferences in their descriptions of approaches and methods for transferring knowledge, values and skills equating to the objectives of mainstream Western EE/EfS.

All of the participants' interview data in this research indicates that capacities for critical thinking " . . . about real, perhaps uncomfortable situations – but that mean something; so not being told 'this is what to think', but developing a position of your truth . . ." (Linda Faulkner) should be imbued as a core part of learning:

> *It is important for us, I think, as a people to know where we stand: our whenua. This is my position. The land to me is important. It's where I come from and it's where I'll go back to. And I want it to still be there when it's my time. And even though this isn't* ***my*** *land, and I'm referring to Dunedin here, I still need to think about what I do here because somebody else's tupuna lie here and somebody else will lie here again. And on a daily basis what I do and how I do it reminds me of that. So I hope that somebody else is thinking that way about what they do on my whenua.*
>
> (Hinewai Ngatai)

10.7 Chapter Summary

This chapter sought to establish whether five themes and core values that have emerged as a finding from the analysis of interview data in Chapter 9 of this research represent a cohesive epistemological and pedagogical framework for EE/EfS informed by Māori culture, as articulated by participants in this research.

It is apparent from the analysis in this chapter of interview data sourced from participants framed within the context of the five epistemological and pedagogical themes, that the five themes are not transferred or learned in isolation and do not stand alone. They inter-relate, inter-connect and are inter-dependent. Elements within each theme, and the themes themselves, appear to reinforce and contribute to each other in a dynamic fashion.

The interview data informed by Māori culture as articulated by the participants in this research of this and preceding chapters suggests an overall purpose of the five themes being the transferral of knowledge, values (particularly including the five core values) and skills for the adaptability, survival, well-being and continuance of the people.

An underpinning perspective of participants evidenced in the interview data presented in this chapter of living learning 'as' or 'as part of' te taiao or 'the total environment' (Brennan, 1974) is consistent with findings of preceding chapters of this thesis.

The nature of the objectives relating to the themes core values in this chapter arising from the data from participant interviews appears to be towards guidance rather than being prescriptive. The objectives appear to be equipped with an wide range of tools, content, method and approaches that facilitate flexibility and adaptability to address a 'curriculum' that arises from individual and community needs in a context of holistic well-being.

Some core elements and aspects of objectives, contents and many approaches have been identified in common with contemporary Western EE and EfS theory and practices within the data. Many aspects of objectives, content and approaches have been identified that appear to be peculiar to perspectives and understandings informed by Māori culture as articulated by participants in this research.

The characteristics and qualities that have emerged from the framework established by the five core values and themes informed by Māori culture as articulated by participants in this research are distinctly different to anything identified in this research's review of the EE/EfS literature[37].

[37] A summary table, bringing together the key themes, sub-themes and categories of the emergent epistemology and pedagogy, is too detailed for inclusion in this chapter but is attached at the rear of this thesis as Appendix F

10.8 Chapter Conclusion

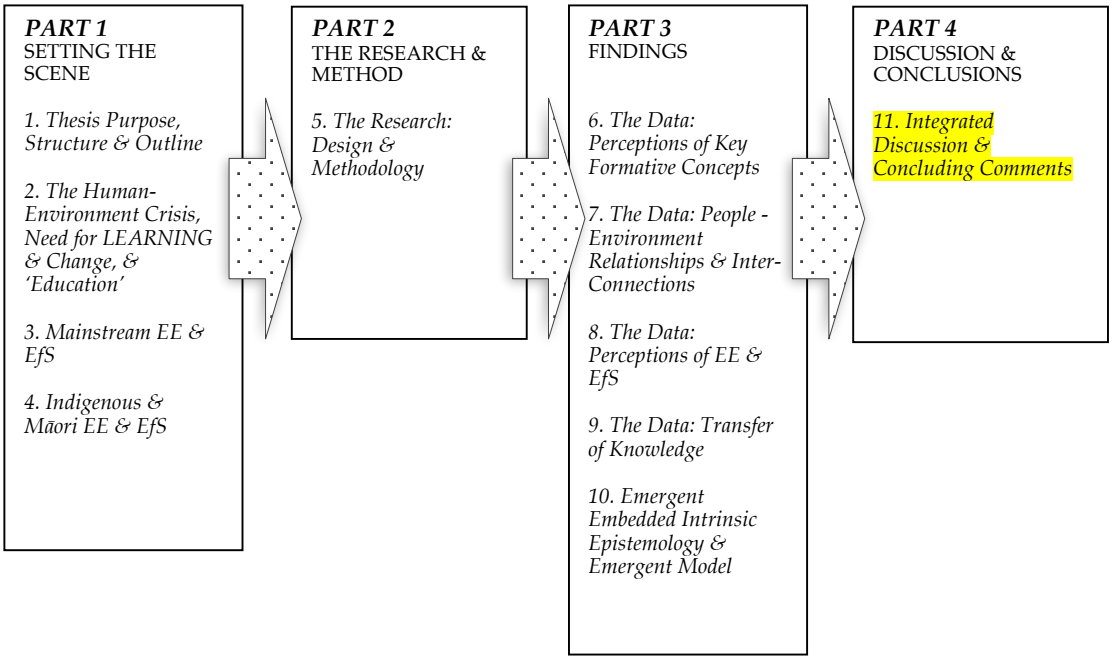
It is the conclusion of this chapter that an intrinsic epistemology and pedagogy for EE/EfS arising from a framework of five core Māori cultural values, with specific yet inter-related, inter-connected and inter-dependent objectives and a reservoir of teaching strategies, is embedded within Māori culture as articulated by participants in this research.

This is the final chapter in this thesis' presentation of results. The following chapter will discuss the findings of this research in terms of mobilising and alternative framework for addressing epistemological and pedagogical gaps in current mainstream environmental education.

PART 4:

DISCUSSION AND CONCLUSION

11.0 INTEGRATED DISCUSSION AND CONCLUSIONS



The development of ecological understanding is not simply another subject to be learnt but a fundamental change in the way we view the world.

(John Lyle, 1994)

11.1 Introduction

In this chapter the findings of this thesis will be discussed against the research purpose and objectives, and conclusions drawn.

The purpose of this thesis has been *to identify ways in which understandings and approaches informed by Māori culture might help address epistemological and pedagogical gaps in mainstream environmental education and education for sustainability*. This has been investigated through three research objectives:

1. *to examine perspectives informed by Māori culture of key terms and concepts that shape or otherwise influence understandings and perceptions of 'environmental education' and/or 'education for sustainability';*

2. *to explore perspectives informed by Māori culture of human-environment inter-connections and relationships;*

3. *to investigate how 'environmental education' or 'education for sustainability' or its equivalent is conceptualised, understood and practiced in perspectives informed by Māori culture.*

The gaps to which this research initially responds have been described in the literature review of Chapters 2-4. The main findings responding to this purpose and objectives were presented in Chapters 6-10 of this thesis.

This chapter will first refer to the key gaps identified in the review of the literature, which provides the context for this research. The main findings will then be revisited in response to the research objectives and purpose. An educational model and framework that has emerged from the findings of this research will be presented (Figure 5) and explained. Its epistemology and pedagogy, including its purpose, objectives and curriculum, will then be discussed against the literature in the context of EE/EfS in Aotearoa-New Zealand. Finally, a discussion of implications for and contributions to academic knowledge will lead to some concluding statements that close the thesis.

11.2 Research Context

Chapters 2-4 of the thesis have reviewed the literature informing the purpose of this research. This thesis is a response to critical gaps identified in the literature regarding the adequacy of human response to the escalating global human-environmental crisis: firstly, that despite fifty years of efforts, particularly through environmental education and/or education for sustainability, no meaningful changes have been achieved, and; secondly, that holistic cultural epistemologies and pedagogies that are potentially key to achieving such urgent paradigm shifts are not considered, understood or included beyond Eurocentric interpretation and integration within Western frameworks. The key overarching gaps identified in this research's review of the literature are:

a. a need to recognise, agree and accept that the necessary shift of mainstream ways of thinking to holistic positions cannot be made using contemporary technocentric mainstream assumptions and frameworks (see such as Cullingford & Blewitt, 2004; Van Eijck & Roth, 2009);

b. a need to identify an appropriate holistic framework, pedagogy and strategy for transition;

c. a need to commit to and comprehensively engage the appropriate holistic framework, pedagogy and strategy.

11.3 Thesis Structure and Outcomes

The results of Chapter 6 have addressed the first research objective and contributed key understandings of formative terms and concepts arising from perspectives of EE/EfS informed by Māori culture as represented by the participants in this research. The second research objective has been addressed through the results of Chapter 7, providing insight into and examples of, the Māori cultural perspectives that informed the insights from participants in this research and their understandings of the connections and relationships between people and the environment. Chapters 8, 9 and 10 have addressed the third objective. Chapter 8 has contributed several findings that establish understanding of how education and learning equating to EE/EfS is conceptualised and understood in this research's participants' perspectives informed by Māori culture, including purpose, objectives and curriculum. The results of Chapter 9 have provided an understanding of approaches and mechanisms engaged in the facilitation of education and learning equating to EE/EfS informed by Māori culture as articulated by the participants in this research. Chapter 10's findings have identified an intrinsic embedded holistic epistemology and pedagogy for education and learning informed by Māori culture as represented by the participants in this research that equates to EE/EfS. This chapter, Chapter 11, draws upon the findings of Chapters 6-10 and responds to the research purpose with the presentation and discussion of an emergent epistemology and pedagogy, conceptual model and framework (refer to Figure 5).

11.4 The Research Process

This is a thesis built on grounded theory (Charmaz, 2006, 2014; Glaser & Strauss, 1967) and methodology, drawing on my own experiences as a teacher, environmental educator, researcher and citizen to identify a problem, and then the starting points and initial theory of this research through the review and consideration of international and Aotearoa-New Zealand literature. I then researched and designed an appropriate methodology, before gathering data through the interviews of tāngata whenua participants throughout Aotearoa New-Zealand. During the process of analysis of the interview data from participant in this research I developed further theory, which I have tested against the literature and further analysis of the data. This spiralling (Manning, 1986), action research process (Gloster, 2000) has built a picture from which we are now are able to address the research question conclusively in the light of a new theory and model that are grounded in the research. The following sections will overview and discuss the findings of this research and its conclusions.

11.5 Key Findings

Central to this thesis and the key contribution to academic knowledge are the identification of an emergent epistemology and pedagogy and subsequent development of a representative model and framework. The results and the process of generating understandings within this thesis have resulted in this conceptual model. The conceptual model depicts dynamic inter-connections, inter-relationships, and inter-dependencies of five core values that have emerged from the interviews and the wider literature that are characteristic of and help maintain Māori culture[38]. These five core values and their dynamics establish a framework for education and learning equivalent to EE/EfS in perceptions and understandings informed by Māori culture. This conceptual model and framework is presented in this section of the thesis as Figure 5 (below).

[38] Aldrich (2008) has described the objectives of education and learning within a culture to include the transferral of core values that are characteristic of and maintain that culture.

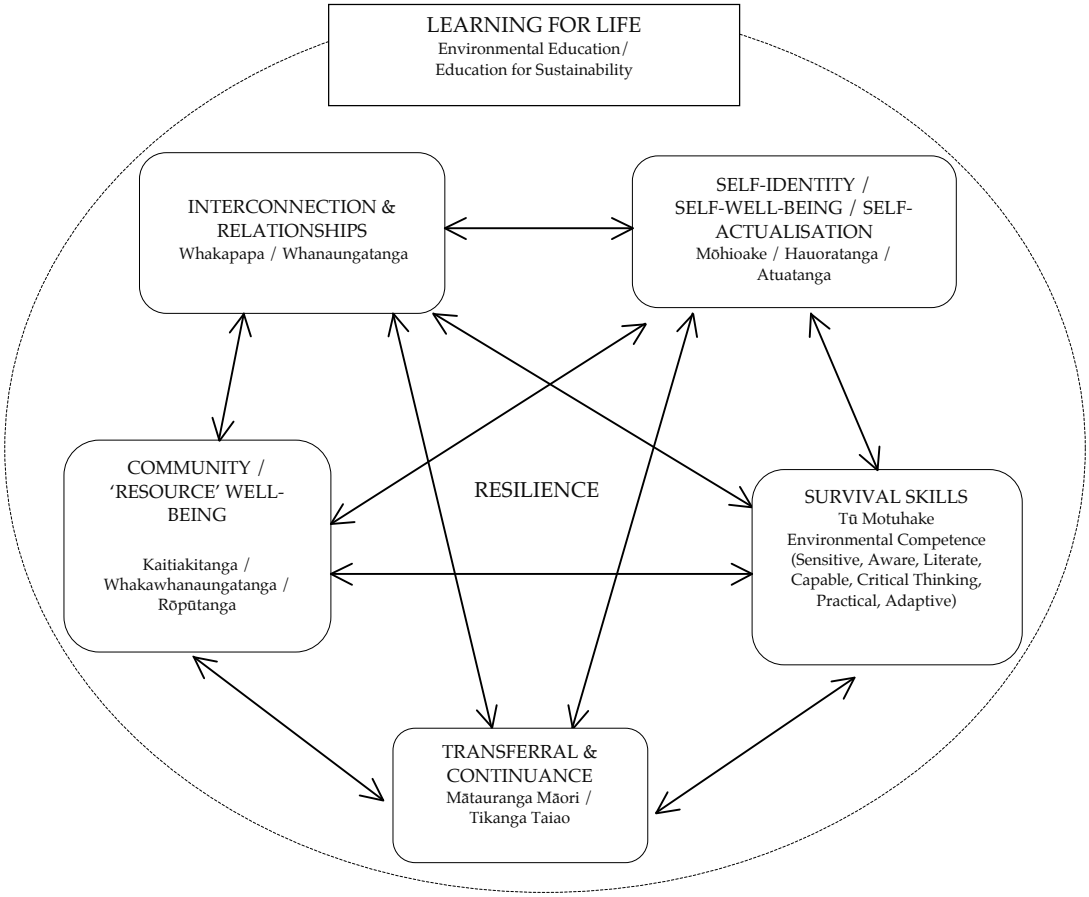


Figure 5: A Conceptual Model of Emergent Embedded Māori Epistemology and Pedagogy for Education and Learning for Life: Survival, Resilience, Well-being and Continuance

Source: Author

Figure 5 illustrates that central to the core values informed by Māori culture, and consequent to their inter-relationships and various capacities, is a capacity for individual and community resilience. Each of the five themes depicted in the Model and Framework (Figure 5) engage the epistemology and comprehensively address the purpose and objectives of the pedagogy described in Sections 7 and 8 of this Chapter. The following section will overview and explain the purpose and nature of each of the five themes of the emergent epistemological and pedagogical framework. The central theme of capacity for individual and community resilience will be discussed later in

this chapter in the context of objectives and curriculum of the emergent pedagogy.

11.6 Overview: The Emergent Epistemological and Pedagogical Framework

Hart (2010) has cautioned that presentation of cultural perspectives resulting from research may be (and he suggests often have been) interpreted and discounted by the reader as representative of cultural mystique. It is important at this stage to qualify the following sections in noting that this thesis has identified epistemology and pedagogy embedded in participant interview data as ideology arising from perspectives in the interview data informed by Māori culture, for discussion here. Ideology is about the envisioning the ideal from a particular worldview (e.g. Mitchell, 1986). As such, what follows is largely inherently utopian in nature: representative of how living and learning could be from perspectives and understandings informed by Māori culture as interpreted from participant interview data.

11.6.1 Interconnection and Relationships

As described in section 4 of this chapter, the fundamental understanding underpinning worldviews informed by Māori culture as articulated by almost all of my participants and reinforced by the literature (such as Ka'ai, 2003; Royal, 2002, Williams, 2004) is that humans are one part of the inter-connected, inter-related and inter-dependent environmental community. Accordingly, this lived reality has been found in this research as a core value of Māori culture as articulated by most of the participants in this research, the theme of which is interwoven in all living and learning activities. The purpose of learning related to this theme is for the development of awareness, knowledge and understanding of relationship with 'the environment' as te taiao through connections (past, present and future) of relatedness, and the development of healthy relationships through whakapapa and whanaungatanga, as well as sense of identity, sense of place and sense of belonging.

All of these qualities and capacities are also described by various authors in the literature as missing or weak in the mainstream Western worldview (see such as Cullingford, 2004; Sterling, 2001) and as being urgently sought yet largely elusive as key objectives of contemporary EE/EfS (Robinson, 2013). Forms of epistemology and pedagogy which have the capacity to facilitate the transferral and embodiment of these qualities and capacities are also being sought (Bolstad, 2003; Eames & Barker, 2011).

11.6.2 Individual/Self Optimisation

This research finds that a second theme and core value for learning informed by Māori culture as articulated by the participants in this research and the literature is primarily about learning to know oneself and become the best one might be to one's potential. The purpose of learning under this theme is to equip and motivate individuals to perform optimally to their individual potential and so contribute optimally to the needs of the holistic community. The objectives of such learning towards this purpose is to develop understanding of and imbue concern for, the well-being of the individual as a reflection of the well-being of the people, who are directly linked and a reflection of the well-being of the land, and vice versa. The objectives include development of self-identity, self-awareness, self-knowledge, and self-worth/value, through connection, sense of place and sense of belonging directed towards self-well-being and potentiating self-actualisation. Key outcomes of this theme are awareness, values, ethics, respect, skills, competence and integrity. All of the qualities sought in this values-based theme also resonate with those of key EE/EfS literature such as the *Tbilisi Declaration* (UNESCO-UNEP, 1978).

11.6.3 Survival Skills

The third theme is about equipping learners for the core value of survival with integrity in te taiao or the total environment. This aspect of learning is about equipping individuals to meet basic needs for survival, well-being and continuance through mātauranga Māori. It involves the facilitation of knowledge, understandings, values, ethics, skills and practices that equip individuals for survival and safety (in a holistic sense) so that they are capable of caring for and providing for themselves, for direct family and for the

community. So at a core level, for example, individuals learn how to locate and maintain fresh water, how to locate and identify food sources, food gathering, preparation and protocols, how to make fire and construct shelters and utilise materials to produce fabric, tools and implements to meet basic needs (e.g. Aldrich, 2008; Maslow, 1973). Another core skill set includes awareness of, sensitivity to and understanding of spiritual/wairua aspects of the environment, how to behave or not behave and how to keep safe in this regard. Individuals learn about maintaining ecological balance through developing and applying levels of environmental awareness, environmental sensitivity, environmental literacy and environmental competence. A key strength and skill sought to be developed in this area is the ability to know how to learn and to think critically, develop individual opinion and make informed decisions. Interaction with the other themes is implicit.

Authors such as Suzuki et al. (2007) suggest that widespread lack of such core skill-sets in mainstream Western society has contributed to lack in awareness of connection and relationship and so unsustainable attitudes, values and behaviours that contribute to escalating local and global human-environmental crisis. Aldrich (2008) suggests that such widespread lack of fundamental skills and reliance upon specialist assistance and technology makes mainstream Western society vulnerable to unforeseen events and change. He and others (see such as Allen, 1970; Robinson, 2010) argue that ways of thinking about education and learning need to change urgently and profoundly to allow such fundamental equipping of individuals and communities. This thesis has identified an epistemology and pedagogy that can help bridge this gap.

11.6.4 Community Optimisation: responsibility and well-being

Māori culture stems from an ethics of co-operative society (Williams, 2004). This research has found that sense of community and strength of community are aspects of a fourth value and theme that is core to perspectives informed by Māori culture: community optimisation, responsibility and well-being. The purpose of this theme is to develop and maintain community cohesion, well-being and strength through inclusion, responsibility, communication, collaboration, cooperation and adaptability; through whakawhanaungatanga

(the practices of being familiness/relatedness), rōpūtanga (the practices of working in a task-group) and kaitiakitanga (practices of taking care of the whenua). This theme concerns learning sense of community and one's place, role and responsibilities as part of a community, including the holistic community (understanding all things are inter-related and inextricably interconnected by whakapapa, and interdependent at some level through relationship), family or whanau described above. It also involves developing awareness and understanding of others' (human and non-human) place, role and capacities as individuals, as part of the community and as part of te taiao. Maintenance of harmony and well-being is the goal. This is a necessary and desirable focus for a cooperative society.

11.6.5 Transfer of Knowledge, Values and Skills Towards Continuance

The overall purpose of the five themes is to transfer knowledge, values and skills for the survival, well-being and continuance of the people. A key understanding within perspectives informed by Māori culture like those expressed by my participants is that the survival, well-being and continuance of the people depends absolutely upon the well-being and continuance of the land. Within such perspectives, people are understood to have a vested interest in understanding, respecting and maintaining balance in their interactions and relationships with the land and its co-inhabitants.

One participant (Tahu Potiki, p. 164) suggested that marrying Māori philosophy to modern applications is flawed in practical terms. However, the results indicate that practical elements of every action are not overlooked within a mātauranga Māori worldview. Perspectives informed by Māori culture as described by most of the participants in this research understand that each action has a consequence – direct or indirect – and only actions of which consequences are understood, appropriate and/or justified should be taken. This research has found that this ethic is applied to the facilitation of learning informed by Māori culture as represented by the participants in this research and, ideally, to all considerations and actions through mātauranga and kaupapa Māori: no action is taken in one thematic area of the epistemology without consideration of the impacts upon the others. This has been described by a few participants in this research as " . . . the Māori

approach . . ." (Zack Makoare), yet it is clear through the literature that it is not uncommon amongst other indigenous cultures (such as Hart, 2010; Cajete, 1999; Kawagley & Barnhardt, 1999; Kemp, 2009; Turner, 2005). Such basic understandings appear forgotten or overlooked in the Western worldview (see Suzuki et al., 2007). With such perspectives and understandings informing a worldview informed by Māori culture, it is hardly surprising that the transfer of knowledge, values and skills towards continuance of the people and their culture represents a core cultural value.

This theme addresses the approaches, methods, tools and processes engaged for facilitating, guiding and informing the transfer of what has been learned in the past that may inform the present and be called upon in the future towards survival and continuance of the people. In academic terms this theme addresses the pedagogy of education and learning: the science of how knowledge, values and skills are transferred.

This being said, few of the set of methods, tools and processes described in Chapter 9 of this research in facilitating, guiding and informing learning - informed by Māori culture as described by my participants and the literature - are unknown in Western mainstream EE/EfS settings. What is critically different and highly significant to the purposes of this research, is the framework of understandings, perspectives and assumptions from which set of methods, tools and processes are applied, based on connectedness, relatedness and relationship, respect, adaptability, resilience, well-being and survival, as will be discussed in subsequent sections of this chapter: a holistic epistemological and pedagogical framework. In other words, it is not the methods, tools, processes and approaches for EE/EfS themselves or in any combination and/or any well-intentioned integration of them into mainstream Western EE/EfS epistemological and pedagogical frameworks that may transition a paradigm shift to ecologically sustainable holistic attitudes, values and behaviours. It is how they are perceived, valued, framed and implemented. Simply put, holistic attitudes, values and behaviours can only be meaningfully realised within frameworks modelling holistic attitudes, values and behaviours.

The importance of this finding to the pool of academic knowledge cannot be understated: it is the single, most important understanding I have taken from my entire journey and process of learning in this thesis. It is because of this understanding and because of the inter-connected, inter-related perspective and nature of understandings and approaches to learning informed by Māori culture like those expressed by the participants in this research and in the literature that this fifth theme offers little without the other four. It is practically ineffective if not meaningless on its own. The significance and potential of the emergent model and framework (see Figure 5) hinge upon the inter-connected, inter-related nature of its epistemology and pedagogy. This in itself appropriately models inter-dependence and an ecological principle.

11.6.6 Resilience

As stated earlier in this chapter, central to the core values informed by Māori culture depicted in the Model and Framework (Figure 5), and consequent to their various capacities and inter-relationships, is capacity for individual and community resilience. In section 2.10.1 of this thesis it was hypothesised that a critical and inseparable interdependent relationship exists between resilience and sustainability. This hypothesis extends Berkes and Ross' (2013) descriptions of an integrated concept of community resilience seated in a synthesis of ecological understandings (see such as Hollings, 1973; Magis, 2010) and complex adaptive systems (see such as Davidson, 2010; Norris et al. 2008; Smit & Wandel, 2006). I theorised that capacity for resilience is both an indicator and component of sustainability (Magis, 2010), and that sustainable attitudes, values and behaviours, along with understanding vulnerabilities, flexibility, innovation and capacity for adaptability, are component qualities and aspects of resilience (Miller & Hopkins, 2013). I argued that this interdependent relationship means there can be no meaningful semblance of sustainability without capacity of resilience while, at the same time, there can be no resilience without capacity for 'sustainability' in terms of capacity to survive and progressively adapt and continue (see such as Aldrich, 2008). Such capacity to survive, adapt, continue and be well as an individual and as a community is represented in the five core values central to, characteristic of, and maintaining, Māori culture, and depicted in Figure 5. In other words, the model and framework depicted in Figure 5 illustrates the inter-relationships

and interdependence of component qualities and aspects of resilience that might facilitate an ecologically sustainable society. Figure 5 at the same time illustrates 5 capacities of sustainability that equip an socio-ecologically resilient society (e.g. Berkes & Ross, 2013). As such the model and framework may be useful in consideration of resilience theory towards developing an integrated approach to achieving community resilience (e.g. Berkes & Ross, 2013, Davidson, 2010).

The relationships between resilience and the core values informed by Māori culture depicted in the Model and Framework (Figure 5), are complex due to their inter-connection, inter-relationship, interdependence and simultaneous occurrence of co-evolving dynamics within socio-ecological systems, reflective of terms used by Berkes & Ross (2013, p. 7) to describe resilience in a broad context of social science (see section 2.10.1). The relationships between resilience and the core values are, however, in many ways illustrated in the manner that the model readily appears to address needs expressed in the literature. For example, Aldrich (2008) and others (e.g. Mehrotra, 2006; Oats, 2001; Porritt, 1991; Sterling, 2001; Suzuki et al., 2007; Simmons, 2008) argue that in order to equip ourselves for resilience and survival and hope to achieve a sustainable future, we need to understand our individual, biological and ecological selves and our basic needs, as well as the interconnections and inter-relationships of which we are part, in context with our specific and global settings, as the basic underpinning of life and learning. The emergent model and framework so equips capacity for resilience: understanding of our individual, biological and ecological selves and our basic needs is addressed at the one and same time through whakapapa/whanaungatanga (interconnections/relationships), self-identity and well-being, and community well-being, while also transferring the knowledge and skills through active learning. All aspects of the model are engaged in some way contributing to individual and community capacity for resilience.

As another example, Simmons (1991) and others (e.g. Gore, 2006; Porritt, 1991; Scholz, 2011) suggests we need to not only understand the probable future and have thought about possible, and preferred futures, but also to look behind us, through history and work out what choices we have collectively

made, learn from these, understand how to adjust and change the way we think, behave and interact. This resonates with the emphasis in the interview data upon whakapapa and whanaungatanga, including songs, sayings, stories and karakia, as means of looking to the past to understand what is happening and about to happen in the now, and so what is likely to happen in the future, so that wise choices may be made for the individual and community wellbeing. Awareness, knowledge, understanding and competence to give meaning in local and wider context and so as adaptive capability and resilience also stems from inter-related transfer of knowledge, capacities of community well-being, survival skills, self-knowledge. Again, in one way or another, all aspects of the model are engaged in some way in this example, contributing to capacity for resilience.

In terms of theoretical explanation, the interview data and literature illustrate that whakapapa underpins Māori culture, recording, identifying and qualifying the complexities of how things have come to be as they are in the now, how they are related and interconnected so that they may be understood and accommodated in relationships. Therefore, if there is a starting point described, it is with whakapapa. At the same time, through awareness and understanding of whakapapa, self-awareness and identity is developed towards knowing the true self and developing an individual to one's potential: to be all that one has potential to be in all regards, aware of their strengths and weaknesses, competent yet humble in their capability. Concurrently all members of a community develop awareness, knowledge, understanding, skills and competence in survival skills (as described in 11.6.3) so as to maintain their own well-being as well as being equipped to perform and provide in this 'basic'[39] capacity as part of a cooperative community. Skills in communication, collaboration and cooperation towards maintaining relationships and wellbeing of the holistic community are developed, respected and valued, including the skills of observation, critical thinking capacity in adaptability. I suggest a human community composed of individuals developed to their potential, aware of and confident in their own and each other's competence and integrity, aware, literate and engaged as

[39] It should be noted that many basic skills are in fact advanced skill sets, such as development of skill in martial arts and bushcraft, as examples of an essentialities in a post-European Aotearoa-New Zealand context.

part of the environment in which they live, represents a socio-ecologically resilient community.

There is little in the literature describing methodologies for facilitating and achieving community resilience (Berkes & Ross, 2013, p. 17). However, as discussed in section 2.10 of this thesis, cultural history and indigenous cultures have been suggested as sources of such methodology (e.g. Aldrich, 2008; Royal, 2010; Simmons, 2008; Suzuki et al., 2007; Turner, 2005, Williams, 2004). Lessons in resilience, adaptability, well-being and survival embodied in indigenous cultures and our collective indigenous pasts related in the literature have been described in Chapter 2, section 10.2. The epistemological and pedagogical model that has emerged from the analysis of the interview data in this research represented in Figure 5 reflects, responds to and adds an indigenous culture's methodological framework to the sustainability and resilience literature. In other words, the model and framework depicted in Figure 5, together with the descriptions of transfer of knowledge in Chapter 9 of this thesis, provide the basis of a methodology for facilitating and perhaps achieving community resilience and ecologically sustainable attitudes, values and behaviours.

The emergent epistemology and pedagogy (Figure 5) appears to represent the capacity sought in the literature (e.g. Bolstad, 2003; Eames & Barker, 2011) for educators to facilitate the realisation of ecologically resilient and sustainable communities and society (e.g. Aldrich, 2006, 2008; Aronson et al., 2010; Blewitt, 2004, Campbell et al., 2001; Lautensach, 2003; Sterling, 2001).
The five themes of the model and framework, illustrated in Figure 5 and summarised above, form the base of learning for survival, well-being and actualisation of self, community and an ecological support system (the Earth) that is the main finding and contribution of this research. This pedagogical framework describes a different way of thinking about learning as a process and 'education' as a purpose and outcome. It articulates an ecological approach to learning, or 'sustainable education' (Sterling, 2001), that is entirely flexible, adaptable and responsive to the needs of individuals and communities, in balance with the environmental context and conditions. The inter-relationships, inter-connections and inter-dependencies, along with the

qualities imbued in the process, equip individuals, communities and peoples within its culture with capacity for resilience and continuance. In other words, this is a model and framework for learning for sustainability.

The following sections will now discuss the epistemology and pedagogy of the emergent model and framework, including its purpose, objectives and curriculum, as specific contributions to academic knowledge in the context of the wider literature in this area.

11.7 Epistemology: Living and Learning 'as Part of' the Environment

A key finding of Chapter 6 is the understanding and assumption informed by Māori culture as articulated by almost all participants in this research that humans live and learn as one inter-connected, inter-related and interdependent part of a total environmental community (te taiao). This result, in itself, is not a new finding, but is nevertheless significant to this research's purpose and provides a starting point for this discussion. It is significant that this theme pervades all the results chapters of this thesis. It has been found in Chapters 8 and 9 that because of this underpinning perspective within Māori culture, there has been no need for the development of a special study of human-environmental interactions and so no cultural equivalent to, or term describing, EE/EfS. The qualities sought as key objectives in mainstream Western EE/EfS are incorporated in the ideals informed by Māori culture like those expressed by many of the participants in this research of living and learning to 'be' as tangata whenua (people of the land). This result leads to three findings that are important to the purposes of this research; the first one particularly so.

The first finding is that people with perspectives informed by Māori culture, as described by some of my participants, live and learn 'as' the environment or 'as part of' the environment, beyond 'in', 'about' or 'for' the environment (e.g. Ministry for the Environment, 1998). This represents an emergent holistic epistemological perspective and understanding that is fundamentally different from mainstream Western perspectives represented in contemporary EE/EfS literature. As such, this is a significant finding that has implications for and contributes to, academic knowledge. This finding is an example of a

consideration or viewpoint that is not possible from an anthropocentric-technocentric frame of reference, but is rudimentary within an indigenous holistic perspective (Hart, 2010) and so is core to conceptualising and achieving a shift in paradigm towards holism. This simple shift in perspective is key to understanding, for example, that harming one's environment (or community in a holistic sense) harms oneself directly or indirectly. This state of understanding and 'being' (Cajete, 1999) is representative of where the mainstream needs to be shifted to: the ultimate objective of EE/EfS. Just thinking, valuing and behaving as part of the environment can help clarify and consolidate such understandings (Booth & Jacobs, 1990) and is perhaps all the seed that needs sowing and nurturing for such change to occur (Mehrotra, 2006), at least at an individual level. Beyond understanding how such a state of understanding is achieved and maintained, implementation of education and learning upon this simple shift in epistemology appears likely to be critical in securing humanity's future.

The second finding is a substantiation of Williams' (2004) observation of a pervasive and enduring conservation ethic evidenced in perspectives, understandings and approaches informed by Māori culture. This is an important quality that Williams (2004) and others suggest is symptomatic of a cooperative society and not common or durable within the contemporary competitive societal mainstream (Chapman, 2004). The relationship of the pervasive and enduring quality with an underpinning holistic ethic embodied in Māori culture substantiates advocacy (see such as Lautensach, 2003; Miller & Hopkins, 2013; Robinson, 2013; UNESCO-UNEP, 1978) for a paradigm shift away from the economic-competitive-growth ethic of the contemporary mainstream and towards co-operative holism.

The third finding is that the underpinning holistic perspective of inextricable inter-connectedness and inter-relatedness of all that is, provides for EE/EfS within Māori culture. This finding illustrates that committed comprehensive engagement of holistic educational frameworks has real potential to shift mainstream awareness, attitudes, values and behaviours towards ecologically sustainable holistic philosophical positions. Going about engineering a transition to such a mainstream condition is the urgent challenge to which

this research responds.

Holistic understandings of inter-relatedness and inter-connectedness appear to underpin perspectives, attitudes and values informed by Māori culture like those of my participants. Understandings of 'education', as well as the purpose and process of learning informed by perspectives of Māori culture appear to juxtapose ideals and key objectives of mainstream Western EE/EfS (e.g. see Ministry of Education, 1999b). While there may not be or even have been (historically), a need for a discipline or descriptor equivalent to EE/EfS apparent in Māori culture as understood by my participants, the pervasive conservation ethic evidences that transferral of qualities ideally sought through EE/EfS occurs effectively nevertheless. Core aspects of a set of understandings, mechanisms and approaches informed by Māori culture for such transference have been identified and described in Chapter 9 of this research. My participants articulated that while the ideals and objectives for transferral are commonly held, the way of thinking about and valuing them is fundamentally different. It is this essential difference that provides a framework that affects the potential for their actualisation. As emphasised in the literature (e.g. Eames & Barker, 2011; UNESCO-UNEP, 1976), a framework arising from and reflecting holistic understandings and approaches would transfer holistic principles, perspectives, attitudes and values. The results of this research indicate understandings and approaches to education and learning informed by Māori culture does provide such a framework. The following sections explain why and how.

11.8 Pedagogy: Transferring Knowledge, Values and Skills

11.8.1 The Purpose of Education and Learning

An important theme and finding arising from the data of Chapter 6 of this research is the belief that central to effective 'education' and learning is both facilitators and students understanding and engaging with its purpose. Aldrich (2008), Cullingford & Blewitt (2004), Sterling (2001) and others in the literature are adamant that critical to change, and very likely human survival and continuance, is a reappraisal and adjustment of the nature and purpose of education and learning in contemporary society.

The purpose of education and learning in mainstream Western society has been described widely in the literature as being determined and perpetuated by the contemporary ethic, focus and drive towards an ideal of indefinite economic development and growth (Miller & Hopkins, 2013; Sauvé, 1999; Sterling, 2001). Because this model and way of thinking and behaving is clearly evidenced to be the main cause of the amassing symptoms of global human-environmental crisis, a different model and way of thinking and behaving is needed.

In contrast, this research found that perspectives and understandings held by most participants in this research describe the purpose of 'education' and learning within Māori cultural practice to be to transfer of knowledge and skills that equip individuals and communities for survival, resilience, wellbeing and continuance. Similar fundamental purpose for education and learning is advocated as an ideal in the literature (see such as Aldrich, 2008; Delors in Blewitt, 2004, p. 25; Millman, 2000; Moss, 2010, Orr, 2001). This purpose was consistently represented throughout the data of this research as 'life-skills'. This general perspective of the purpose of 'education' and learning has synergies with the National Curriculum (2007) and other formative documents, including *The Belgrade Charter* (UNESCO-UNEP, 1976) and *The Tbilisi Declaration* (UNESCO-UNEP, 1978). The main element of difference influencing the potentialities of understanding and approaches to education and learning informed by Māori culture as against mainstream Western EE/EfS lies in applications of an holistic-indigenous rather than a technocentric-Eurocentric philosophical frame of reference. This difference needs to be clearly understood and addressed. The perpetuation of the mainstream Western educational model based on an unsustainable economic ethic of indefinite growth in the face of basic ecological truths does not make sense: in fact it is arguably suicidal (Suzuki et al., 2007). The underpinning purpose of education and learning needs to be urgently realigned to an ethic based on capacity for sustainability: for survival, resilience, well-being and continuance.

In an indigenous sense, a community is only as strong as its members (Kemp, 2009; Ulluwishewa et al., 1997). The strength of a community's relationships and respect, institutionalised in its culture, is enhanced or constrained in its members' ability to communicate, collaborate and cooperate (David, 2003). By optimising each individual's development to their potential based on holistic and realistic perspectives, each individual is able to contribute most effectively to and as part of the community, for the good of all. In this sense 'education' is truly a community investment in its members, towards its continuance and collective futures.

By comparison, Robinson[40] and others explain Western society's education is directed at standardising an education 'product' that is not applied or practical, within a competitive social climate. Society is, in the main, reliant upon specialists to do specific practical tasks and run society (Suzuki et al., 2007). As a result most citizens lack general practical, survival or 'life-skills'; a very vulnerable situation. In descriptions of an idealised community informed by Māori culture such as some reflected in the interview data of this research many members, if not all, have the base life-skills and are literate to the environment to address basic needs, as well as specialist skills. This may or may not be so. Applying similar ideals, there has been a time in Western society when communities were similarly equipped (Aldrich, 2008). In order to become an ecologically and socially resilient community (Berkes & Ross, 2013) Aotearoa-New Zealand needs to recover such competencies through a change in thinking about, framing and practicing education and learning.

The following section will describe the outcomes sought through the transfer of knowledge, values and skills in the EE/EfS philosophy and pedagogy that has emerged from this research.

11.8.2 Objectives

Understandings of 'education' as well as the purpose and process of learning informed by Māori culture, are represented in the interview data in Chapters 6, 8 and 9 of this research. Qualities described in the data as crucial for an individual to be well-equipped for life (life-skills) closely resemble the Tbilisi

[40] www.ted.com/talks/ken_robinson_changing_education_paradigms.html

(UNESCO-UNEP, 1978) objectives for environmental education, with some additions (highlighted):

- holistic awareness,
- knowledge,
- understanding,
- connection (with self and surroundings),
- attitude, values and integrity,
- practical, critical and communication (in a holistic sense) skills,
- motivation and participation
- competence and adaptability.

These additions require a short explanation. The capacity of awareness is relative to individual and/or cultural perspectives of reality as well as individual sensitivities. For example, the idea of learning as or as part of the environment (described above) has emerged from this research as a perspective and an assumed reality in perspectives informed by Māori culture of many of the participants in this research that is not contemplated as a possibility in literature reflecting Western technocentric or Eurocentric (Hart, 2010) perspectives of reality. The data describing learning 'as part of' the environment emphasises a need for awareness of the total environment (Scott, 1984) and its interactions: physical, biological, social, cultural, emotional and metaphysical (see definition of key terms, Chapter 1). Such learning describes awareness of the whole: hence the distinction 'holistic awareness'. This is consistent with Fien's (2001) and others' descriptions and advocacy of holistic perspectives as part of the critical shift in thinking needed to effect a meaningful transition in paradigm.

The capacity of 'connection with self' refers to data emphasising need to develop and maintain intimate awareness and knowledge of potential, current state of health, condition and well-being, needs, physical and mental capacity, skills, strengths and weaknesses of individual self (Abraham Witana; Matua Hori Parata, T2). This capacity is also described in the literature as a feature of indigenism (see for example Hart, 2010).

'Connection with surroundings' is similarly documented as a feature of indigeneity (see such as Cajete, 1999) and is linked with holistic capacities of communication. Both involve awareness, recognition and interaction with all dimensions of the total environment manifested in perspectives informed by Māori culture of almost all of my participants, for example, in matter-of-fact descriptions of wairua and everyday communications with deceased ancestors (Dr. Pip Pehi; Linda Faulkner; Te Moengarau Hemopo) and/or conversations with waterways (Linda Faulkner; T14; Zack Makoare), birds (Rawinia Puna), whales (Matua Hori Parata) and/or trees of the forest (Abraham Witana; Dr. Hauiti Hakopa). Lack of awareness or philosophical acceptance of worldviews and realities such as these within mainstream perspectives does not affect their actuality: it merely limits mainstream perceptions of possibility (Hart, 2010).

The emphasis upon the capacity for 'motivation' arises from descriptions in the data in Chapter 6 and 9 of this thesis of the importance of one's sense of connectedness and relatedness, and related sense of identity, sense of place and sense of self as part of all that is in creating a sense of belonging, emotional attachment and responsibility (caring). The capacity to care stimulates committed engagement or 'motivation' to participate fully. Such rationale emerging from the data has synergies with descriptions of what EE/EfS needs to be. For example, authors including Aldrich (2008), Bolstad (2003), Bowers (1999), Robinson (2013), Sauvé (1999) and Tilbury (1995), list descriptions of what EE/EfS needs to be, including:

- Relevant
- Holistic
- Clear
- Meaningful
- Values-oriented
- Issues-based
- Practical
- Action-oriented

- Interesting
- Engaging
- Critical

The *Tbilisi Declaration* (UNESCO-UNEP, 1978) also advocates that qualities such as these should underpin all learning, social activity and human-environment interaction.

Capacities of 'competence and adaptability' are an important addition to the Tbilisi template emerging from this research. The objective of competence in life-skills has been identified as a bottom line measure within perspectives of learning informed by Māori culture both in the findings of this research and in the literature (see Cooper, 2010; Durie, 2010; Royal, 2007). Within such perspectives, competence in life-skills is expected of everyone. Learner competence is demonstrated in the levels of awareness, skill and ability to observe, understand, think critically and creatively, communicate, collaborate, cooperate and do, measured in wellness and the ability to adapt and survive comfortably, ensuring provision for future generations. This is a model of sustainable education (Sterling, 2001).

A distinction of perceptions and understandings of what construes 'success' in perspectives informed by Māori culture in contrast to those informed by mainstream Western perspectives is clarified through understanding what is valued as the purpose and outcomes of education and learning. 'Success' in terms of ideals informed by participants in this research's results is reflected in degrees of competence, mana, comfort, health, well-being, self-esteem, and happiness at individual, family and community levels.

In contrast, in the context of contemporary Aotearoa-New Zealand, as an example of Western society[41], competence is measured against industry standards (National Standards in primary; NCEA in secondary; degrees in tertiary) (Eames & Barker, 2011) and demonstrated in individual's ability to " . . . regurgitate accepted thinking . . ." (Linda Faulkner), in order to 'achieve'

[41] www.ted.com/talks/ken_robinson_changing_education_paradigms.html

standardised ‘qualifications’ (Chapman, 2006). Sterling (2001) observes that individual ‘success’ in mainstream Western society is commonly determined to a greater or lesser degree by level and nature of academic qualifications, position held, income bracket and standard of living. Contemporary education is about perpetuating the status quo, which has led to the escalating global-human crisis and is not ecologically sustainable and, as such, is not a sustainable model.

The results of Chapter 9 include descriptions of an ideal outcome of education and learning informed by Māori culture articulated by many of the participants in this research as being the development, maturation and holistic well-being of each individual within a holistic ‘community’ as one part of an interactive, inter-connected, inter-related and inter-dependent whole. This result is consistent with the literature in the context of Māori education and learning in Aotearoa-New Zealand (Durie, 2004, 2010; Edwards, 2010; Hook, 2007; Macfarlane, 2004; Royal, 2007). Also consistent with this set of literature is an overarching ideal objective for education and learning described in Chapters 6 and 9 of this thesis: for the optimisation of each individual towards their individual potential (atuatanga). What appears to be a new finding emerging from Chapter 9 of this research is an objective for learning of all individuals within a community being optimally competent (and aware of each other’s level of competence) to equip an optimally competent, adaptable and resilient community. The ramifications of this set of findings link with the following paragraph, and will be discussed later in this chapter in the context of community and ‘resource’ well-being and community resilience.

The capacity for ‘adaptability’ is a recurring theme in the results of Chapters 6, 8 and 9 of this research as an important objective of education and learning informed by Māori culture as represented by my participants. The perceived value of adaptability has been explained in the interview data as a cultural response to the recognition of a perpetually changing world in a perpetually changing universe (Abraham Witana; Dr. Hauiti Hakopa). Survival and continuance in such a setting requires perpetual awareness of, sensitivity to and literacy (see such as Orr, 1990; Roth 1991, 1992) of the state of te taiao in

both general and specific contexts, as well as knowledge, understanding, attitude, skills and competence to maintain balance and/or adapt appropriately to change. Authors including Dovers (2007) and Smit and Wandel (2006) advocate such adaptive capacities as a key component of individual and community resilience, lacking in mainstream Western societies (such as Norris et al., 2009). The literature reviewed in Chapter 2 indicates that community resilience, 'adaptability', 'adaptive capacity' and 'vulnerability' of human systems have become part of a closely associated focus are increasingly becoming a closely associated focus of research and literature as acceptance of symptoms of the global human-environmental crisis spreads and as a consequence of increased incidents of large-scale natural disasters (see Berkes & Ross, 2013; Fazey et al., 2007) and economic recession (Codburn, 2009). The inter-relationship between resilience, adaptability, well-being and vulnerability are described in section 2.10.1 of this thesis. The results of this research lead to a finding that, despite not being articulated in such terms, individual and community resilience is an underpinning quality and outcome of education and learning informed by Māori culture.

11.8.3 Curriculum

The descriptions of approach to curriculum and learning resulting from this research are consistent with Royal's (2007) descriptions of education and learning informed by Māori culture (see also Durie, 2010; Edwards, 2010; Mahuta, 1974). Such descriptions have synergies with those by such as Aldrich (2008), Bolstad (2003), Bowers (1999), Robinson (2013), Sauvé (1999) and Tilbury (1995), of what EE/EfS needs to be (refer to Chapter 3). There are further synergies with Jensen & Schnacks' (1997) ideas of action competence, and particularly with Eames et al's (2009) frameworks for action competence and whole-school approaches to learning and curriculum in Aotearoa-New Zealand. The key competencies identified in the National Curriculum (Ministry of Education, 2007) also converge well with the action competence literature (Eames et al. 2009). Action competence and whole-school approaches to learning and curriculum have also been described in Chapter 3 of this thesis. A key element of difference between the descriptions of curriculum and approach informed by Māori culture identified in this

research and those of approaches arising from the literature lies in philosophical perspectives of the nature and purpose of education and curriculum.

Mainstream literature (such as Bolstad, 2003; Chapman & Eames, 2007; Eames et al., 2009; Enviroschools, 2012) and interpretations and approaches to EE/EfS in Aotearoa-New Zealand respond to institutionalised perspectives informed by mainstream Western worldviews, perspectives and interpretations of the National Curriculum (Ministry of Education, 2007) and guiding documents such as *Guidelines for Environmental Education* (Ministry of Education, 1999b) and the *Strategy for Environmental Education* (Ministry for the Environment, 1998). As a result, mainstream EE/EfS efforts, such as Enviroschools (Enviroschools, 2012) and Eames et al. (2009) provide frameworks for action competence and whole-school approaches to EfS (Eames et al., 2009) that are largely constrained within mainstream Western perspectives. For example, both the Enviroschools programme (Enviroschools, 2012) and the frameworks for 'action competence' and 'whole-school approaches' of Eames et al. (2009) seek to achieve change to holistic perspectives through integration of holistic values informed by Māori cultural values (see also Chapman & Eames, 2007). While laudable, this is arguably the most critical limitation that is symptomatic of the key gaps identified in this research, described above in section 2 of this chapter, the underlying principle of which is: change to holistic philosophical positions cannot be achieved upon assumptions and frameworks arising from technocentric perspectives.

Authors, including Hart (2010) and Gibbs (2006), argue that the integrity of indigenous cultural constructs and values is compromised when they are applied within and interpreted from mainstream Western frameworks. Indigenous worldviews are vastly different from the dominant cultural worldview in Western societies (Hart, 2010, p. 4). Sometimes conceptions and perceptions differ so greatly that translations either way are inadequate if not impossible (Turner, 2005). The findings of Chapter 6 of this thesis illustrate this: terms informed by mainstream Western culture that shape understanding of key constructs of this study, including 'the environment',

'sustainability' and 'education', do not have a direct translation or parallel concept within the kinds of perspectives informed by Māori culture and articulated by almost all participants in this research.

Further, some of the data supported observations in the literature that many efforts to date equate to attempts at appeasement (Gibbs, 2006) if not tokenism (Rumbles, 1999), and provide ". . . a [cultural] box to tick" (Matua Hori Parata). Authors, including Gibbs (2006), Royal (2007), Rumbles (1999) and Smith (1992), suggest that attempts at a marriage of Māori philosophy to modern Western education, environmental and conservation (amongst others) policies in Aotearoa-New Zealand have historically been flawed. Both the findings of this research (see Chapters 6 and 8) and the literature (such as Williams, 2004) argue that meaningful integration of holistic values - such as those informed by Māori culture - into technocentric frameworks is not workable due to irreconcilable philosophical dichotomy (O'Riordan, 1995): each philosophical position is the antithesis of the other (Williams, 2004). Hart (2010, p. 4) observes that in application, when they are acknowledged, indigenous worldviews are most often interpreted through a Eurocentric point of view. In light of both this research's review of the literature and findings, the contemporary drive for integration of cultural principles and terms in guidelines and policies appears well intentioned but misguided. There appears to be no middle ground in this tension.

Mainstream education in Aotearoa-New Zealand, including EE/EfS, is implemented within a framework responding to the National Curriculum (Ministry of Education, 2007). The National Curriculum (Ministry of Education, 2007) represents an important, potentially transitional or transformative (Sterling, 2001) document. It is couched in terms that are acceptable and capacity-building in both anthropocentric-technocentric-commercial and ecocentric-holistic perspectives, yet leans towards the status quo. In other words, to a large degree, the National Curriculum's interpretation and application depends upon the frame of reference or worldview and socio-ecological assumptions of a reader. Despite some technocentric assumptions evidenced within the National Curriculum (Ministry of Education, 2007), when interpreted from a holistic or literal

perspective the significant transitional[42] potential becomes apparent. Its terms provide for and encourage communities and their schools to design curricula according to each learner-community's needs[43]. This provision has clear synergies with holistic perspectives of educational purpose and objectives described above as findings of this research. The key competencies identified in the National Curriculum (Ministry of Education, 2007) converge well with the action competence literature (Eames et al. 2009).

A finding of Chapter 6 of this research has been a perspective informed by Māori culture as articulated by participants in this research of a general or core curriculum for education and learning that should arise from a framework of life-skills that essentially is EE/EfS. The nature and content of such curriculum should be meaningful, relevant, confronting, practical, engaging, flexible (to accommodate individual needs) adaptable (to context). The epistemological and pedagogical framework emerging from this research and illustrated in Figure 5 at the beginning of this chapter represents just such a framework.

The findings of Chapter 6, 8 and 9 of this thesis identify the ideal content and nature of a such a meaningful 'curriculum' informed by Māori culture as described by most of my participants and in the literature (e.g. Edwards, 2010) as being driven through 'need' in terms of: a) what is useful and applicable in context of location, situation, individual and community, and; b) what is useful as life-skills in relation to wellbeing, happiness, health and readiness 'now' and in the future. The content and composition of 'curriculum' varies accordingly, guided by the specific individual qualities, character, interests and needs of the learner in the given context (i.e. location, situation, individual and community and what is useful, as described above), in balance with mātauranga, kaupapa and tikanga. In keeping with the mātauranga Māori, as basic individual competencies are established as part of the core life-skills curriculum, the curriculum can continue to expand as part of a life-long process, reflecting the needs, interests and attributes of the

[42] The term 'transitional' in the context of this thesis refers to the capacity to shift perspectives of acceptability of terms and constructs, and so understandings from one position towards another.
[43] http://nzcurriculum.tki.org.nz/Curriculum-documents/The-New-Zealand-Curriculum/The-school-curriculum-Design-and-review

individual and the needs of the local community and capacities required for individuals to operate and develop within it.

While a description of suggested implementation is beyond the scope of this thesis, an overview of the nature of its ideological implementation is as follows. The 'curriculum' that arises from the overarching purpose of 'life-skills' is flexible to accommodate different and/or shifting contexts, including geographic location, changes in conditions (such as climate and topography), social variability (such as between iwi), as well as variables that are relevant to individuals contributing to a cooperative culture and society. Rather than being institutionalised, however, as in the mainstream Western educational model, education and learning core 'curriculum', content and pedagogy informed by Māori culture is ideally integrated within everyday life as experiential learning, in a relevant and meaningful fashion. Further, 'the curriculum' and programme of learning-activities, as well as the array of tutors or mentors, are ideally as much as possible individually aligned to the needs, interests and potential of each learner. All curriculum content should be practically applicable, demonstrable and able to be individually experienced, relevant and meaningful, rather than abstract, and should be integrated and identified in other activities.

The core curriculum content would develop according to the needs of the individuals within a local community to actualise their potential, and in doing so would actualise the potential of communities to survive with integrity and continue in that context. The wider curriculum would then reflect a response to the needs of individuals and communities functioning at a more specialised level outside of their immediate community and/or in context with changing needs: building competence, specialisations and adaptive capacities.

The wider curriculum strands would arise from the base of the emergent Māori epistemology for environmental education (Figure 5), as might strands from the base of a basket, to be joined and interconnected and woven into the strong fabric of competent and capable individuals making up a competent, adaptive and resilient community. Obvious strands of learning opportunities and needs will arise, many of which are included in the contemporary New Zealand Education Curriculum (2007), but may not align with contemporary ideas of priority or need in an individual's development. Reading and

writing, as within the Waldorf – Rudolph Steiner philosophy (Dahlin, 2010; Rivers & Souters, 1996) for example, may or may not be useful or a priority until later in life, if at all. The key difference is that the learning strands arise from the specific community itself; they may be suggested but are not imposed. Relevance and meaning would become automatically and actively sought by learners as they become masters of their own learning process, seeking understanding of what they are involved with, how it inter-connects and inter-relates and its appropriateness to their awareness, knowledge and understanding of the world (Abraham Witana, 2011). A conceptual model of how such a curriculum would arise from the emergent Māori epistemology for environmental education is illustrated in Figure 6.

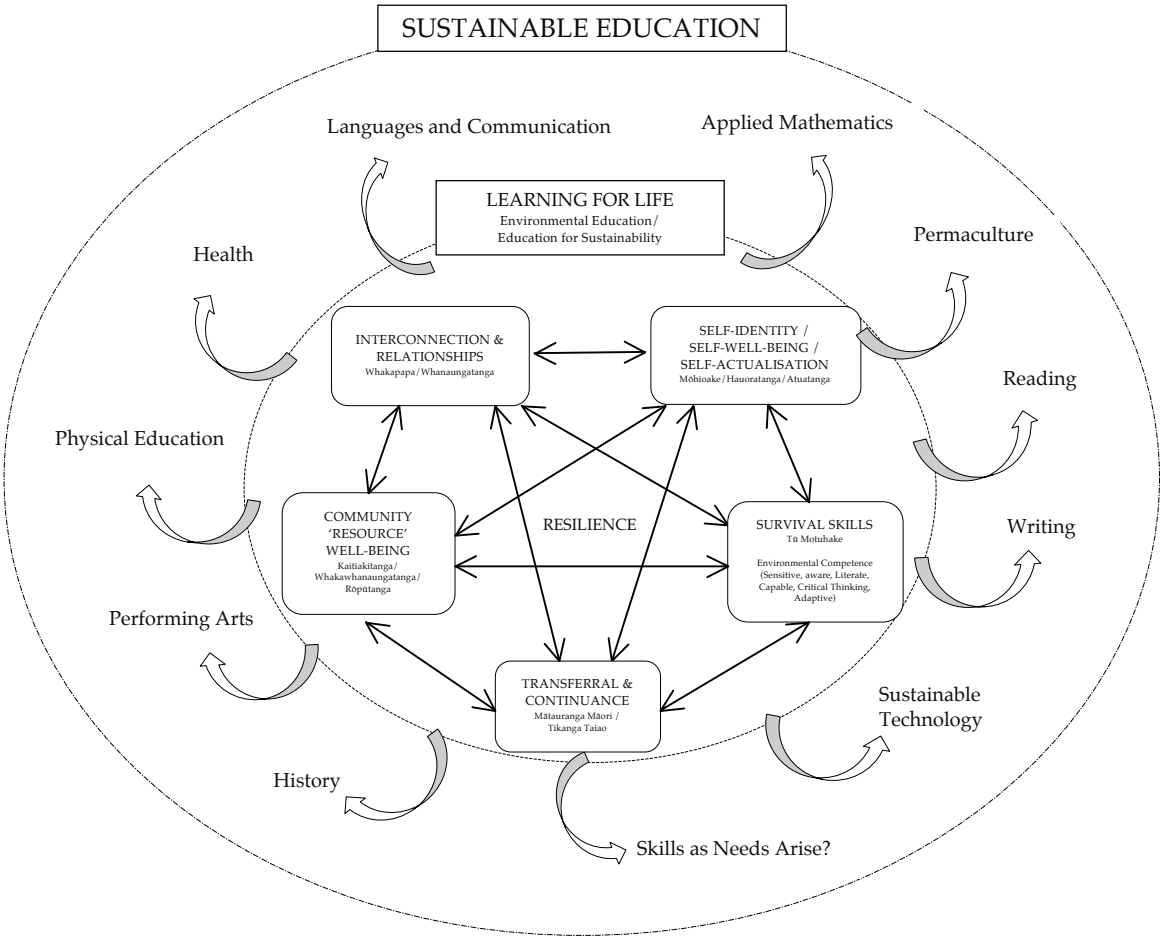


Figure 6: An Applied Conceptual Model of Emergent Māori Epistemology as the Foundation for Sustainable Education: Learning for Survival, Resilience, Well-being and Continuance

Source: Author

From perspectives informed by contemporary mainstream Western understandings of education, learning and related frameworks being reductionist, centre- and/or class-room and schedule-based, institutionalised, transmissive and standardised[44], implementation of such a curriculum and related logistics may appear demanding of resources and hugely problematic, if not 'impossible'. However, Rudolph Steiner/Waldorf approaches to education and learning (Dahlin, 2010; Oberski, 2011) and some Enviroschools (Jackson, 2009) reflect similar pedagogy (although limited by being examples of integrated holistic-technocentric blends framed upon technocentric assumptions), at least in initial transitional capacities. Transitional understandings and approaches to education and learning informed by Māori culture, as represented in Figure 5 and described in this thesis, may overcome such limitations and so has huge potential for engaging learners in active participation in meaningful applied activities, learning life-skills while addressing real issues. Such revolutionary changes in educational thinking and practice are advocated and championed by such as Oxford and Lin et al. (2012), Robinson[45], Sterling (2001) and others towards objectives consistent with the purpose of this research.

The findings resulting from the analysis of Chapters 6 – 10 discussed to this point of this thesis have several implications for and contributions to academic knowledge. The following section will discuss these.

11.9 Implications and Contributions to Academic Knowledge

The most important singular outcome and contribution of this thesis to the academy, and the key contribution of this research and its outcomes, has been the emergence of the holistic epistemology embodied in the understanding informed by Māori culture, as described by my participants, of people living and learning 'as' or 'as part of' the environment. This fundamental understanding underpins all other outcomes of this research. The implication of this contribution is particularly significant: that all learning should be framed upon and arise from 'EE/EfS', in terms of the holistic epistemology's

[44] Robinson http://www.ted.com/talks/ken_robinson_changing_education_paradigms.html
[45] ibid.

emergent pedagogy: illustrated in Figure 5 in this Chapter. The emergent epistemology extends upon knowledge and understanding in the contemporary literature. It addresses an inherent gap and weakness in mainstream Western epistemology, pedagogy and approaches to EE/EfS of separating people from the environment through facilitation of education and learning 'in', 'about' or, at best, 'for' the environment (see sections 2.6 to 2.10 of this thesis). Shifts in facilitator understanding and subsequent facilitation of education and learning as part of the environment may be the catalyst needed to facilitate a transformative response to the current human-environmental crisis (e.g. Oxford & Lin et al., 2012; Sterling, 2001, p. 11; 2005) and achieve an ecologically sustainable paradigm (e.g. Aldrich, 2008; Cullingford, 2004; Orr, 1994; Stables et al., 2002; Suzuki et al., 2007).

The main contribution of this thesis has been the identification and description of an intrinsic holistic epistemology and pedagogy for education and learning embedded in perspectives informed by Māori culture. This epistemology and pedagogy has extended upon the literature regarding knowledge informed by Māori culture, as well as contributing to understandings of indigeneity and transfer of knowledge, attitudes and values within indigenous cultures. It has also contributed to the pool of knowledge and understanding of education and learning, and particularly to the literature associated with EE/EfS. Most importantly, in terms of the research purpose, the emergent intrinsic holistic epistemology and pedagogy for education and learning informed by Māori culture as articulated by this research's participants addresses epistemological and pedagogical key gaps identified in mainstream Western EE/EfS. Specifically, it has contributed an appropriate holistic framework, epistemology and pedagogy for education and learning for survival, resilience, well-being and continuance in the context of Aotearoa-New Zealand.

A further contribution is the *Conceptual Model of Emergent Embedded Māori Epistemology and Pedagogy for Education and Learning for Life: Survival, Resilience, Well-being and Continuance,* presented as Figure 5 in Section 4 of this chapter. This model helps the visualisation and understanding of the complexity of inter-connections, inter-relationships and inter-dependencies of

the organic, dynamic processes of education and learning in a clear, holistic manner, differing from the mainstream propensity for linear, problem-based, reactive managerial renderings of educational models evident in the literature (such as Eames et al., 2009). The rendering of the representative diagram literally models a holistic cyclic, and an all-encompassing perspective of inter-connection, inter-relation and inter-dependence, which in itself helps facilitate shifts in perspectives. This modelling assists assimilation, understanding and recruitment of the model for engagement and implementation.

The emergent epistemology and pedagogy and conceptual model (see Figure 5) has contributed to the development of understanding of holistic worldviews, perspectives and approaches as a resource for educators, managers and decision makers to assimilate and apply in policy and practice. As such, the model and framework provides increased opportunity for open-mindedness, mutual learning, new insight and appreciation of diversity (Cheung, 2008, p. 5), in education and resource management policy and planning, bridging gaps towards realising a necessary shift to an ecologically sustainable paradigm.

Another set of contributions relate to the pedagogy informed by Māori culture that has emerged from this research. Firstly, a clear, engaging and relevant (Sauvé, 1999) purpose for holistic education and learning has contributed a meaningful alternative perspective to the academy to help inspire a necessary reappraisal and adjustment of contemporary mainstream philosophies and approaches (see such as Aldrich, 2008; Cullingford & Blewitt, 2004; Sterling, 2001). The emergent purpose focuses upon equipping individuals and communities with knowledge, values and skills for life: for survival, resilience, well-being, and continuance. Education for survival, resilience, well-being and continuance has particular scope in Aotearoa-New Zealand subsequent to events such as the Christchurch earthquakes (Berkes & Ross, 2013) and the economic recession (Codburn, 2009). Initiatives in food cultures, community gardening and community hubs have correspondingly escalated in Aotearoa-New Zealand (Cooper et al., 2012). At the same time there has been increased governmental focus and assistance with 'community resilience' initiatives. However, these follow a reactive paradigm of

'preparation and response' and primarily focus on two strands: that of social science dealing with adversity (Norris et al., 2008) and economic recovery following natural hazard events (Codburn, 2009; Finnis, 2004); and that of clinical science dealing with psychological trauma and mental health outcomes following an emergency (Berkes & Ross, 2009). Conceptual understanding and development of community-level resilience theory and practice is in its infancy. The development of embedded culture that embodies community resilience would be a constructive focus and vehicle for transitioning the social paradigm to an ecologically sustainable model. The nature, purpose and objectives of the emergent epistemology and pedagogy align with this rationale.

A second pedagogical contribution of this research to academic knowledge is a clear, relevant, meaningful, practical and engaging set of objectives for holistic education and learning, consistent with core EE/EfS literature, with the key objective being community resilience. This contribution extends upon existing literature and includes alternative perspectives and considerations of the value of qualities, capacities and skills, measuring competence and gauging success. The comprehensive and cohesive nature of these objectives and their rationales, and their description in the context of Aotearoa-New Zealand, makes them easily understandable, appealing, motivating and able to be adopted and implemented.

The third contribution to academic knowledge relating to pedagogy has been a description of a very flexible curriculum informed by Māori cultural values, as articulated by participants in this research, that arises from a base or framework of core life-skills that embody EE/EfS, and responds to individual as well as community needs and context holistically in terms of the epistemology, its purpose and objectives. Such curriculum has synergies with the National Curriculum (Ministry of Education, 2007).

The fourth contribution is the identification of considerable potential for the National Curriculum (Ministry of Education, 2007) as a facilitative policy for a transitional (McKay, 1998, p. 43; p. 57) or transformative response (Sterling, 2001, p. 11) to the current human-environmental crisis (e.g. Campbell, 2001;

Diamond, 2003; Gilding, 2012; Orr, 1994) that would support and substantiate the engagement and implementation of the emergent holistic epistemology and pedagogy as the framework for all education in Aotearoa-New Zealand schools. A transitional strategy would be useful, effective and appropriate for schools and communities, if not the Ministry of Education, to engage both for an accelerated path towards realising an ecologically literate, equitable and sustainable community and culture.

A fifth contribution of this thesis to academic knowledge is the finding that meaningful integration of principles and values informed by Māori culture in EE/EfS guidelines and policy (Chapman and Eames, 2007) is not workable so long as such guidelines and policy are founded upon mainstream Western perspectives and assumptions. However, integration of mainstream Western perspectives upon a holistic framework could work. While the differences in the philosophical perspectives are fundamental, the very holistic-realist, adaptable nature of a Māori worldview, as articulated by most participants in this research, suggest meaningful integration of mainstream Western perspectives upon a holistic framework, whether articulated as a perspective informed by Māori culture or not, would be workable – particularly in a progressive transitional process. Such a shift would allow a merging of perspectives, knowledge, understandings of the best of both worldviews, producing an integrated worldview that would be enriched in the depth, wisdom, diversity, technical ability, open-mindedness and potential of both, towards achieving an ecologically sustainable future for Aotearoa-New Zealand. Melanie Cheung (2008), for example, has described an exciting potential for the blending of the synergies, as well as celebrating the differences of the holistic perspectives of Māori and with the reductionist perspectives of western science to ". . . broaden the horizons of understanding" (ibid., p. 5). It is clear that the main shift is required of those who hold the Western perspective, upon which contemporary society is based; a further confronting proposition for contemporary society's 'powers that be'. The probable consequences of Western society's decision-makers choosing not to make such shifts towards a holistic paradigm impact upon humanity's capacity to survive and continue in the face of accelerating global ecological change.

11.10 Concluding Comments

In light of evidence of an escalating global human-environmental crisis to which an adequate human response is crucial yet lacking, this thesis has investigated ways in which understandings and approaches informed by Māori culture can help address critical gaps in mainstream environmental education and education for sustainability epistemology and pedagogy. A Grounded Theory research and spiralling methodology was engaged for this research, resulting in a previously undescribed holistic epistemology and pedagogy informed by Māori culture as articulated by participants in this research, and equating to EE/EfS being identified that addresses the critical gaps. A model and framework aiding the visualisation and communication of the holistic epistemology and pedagogy informed by Māori culture has been developed and presented.

When I commenced this journey and process of learning in 2007, as articulated in Chapter 1, I came to this thesis with a lot of concerns. I was concerned about the state of the global environment; I was concerned about an apparent lack of progress in society making meaningful changes towards ecological sustainability and a lack of awareness and connection of the ramifications amongst the pubic with whom I interact and in the literature and in the media, since my last involvement in research in 1998; I was concerned about my own state of embodied health; and, most of all I was concerned about my children's' wellbeing and futures. The research process that unfolded around this thesis reflects my own personal 'grounded theory' of seeking answers and understanding of these many problems. Through this process, I have gone to the literature to search out local and global expert knowledge, and I've listened to and talked with kaumātua and other respected tangata whenua as the bearers of deeply local expert understandings, to try and seek out reasons why my gut instinct was telling me that Māori cultural perspectives, understandings and approaches, and probably those of other indigenous peoples in context with their lands, were going to be better than the contemporary understandings and approaches to EE/EfS, and to engage with the paradox that, despite the need and

acknowledgement and rhetoric in the literature, we are not looking there enough for answers.

In September of 2012 an abstract of this research and its tentative findings, including a description of the emergent intrinsic Māori epistemology for 'environmental education' and related theoretical framework for sustainable education was presented at the Australian Association for Environmental Education's National Conference. Feedback was very enthusiastic, and reinforced the appropriateness of the topic and excitement at its tentative findings and, in particular, at the credibility of the emergent theory and its potential implications and useful applications. A copy of the abstract and diagrams modelling the emergent theory and its potential application as a basis of education curriculum was also circulated to participants for their information and comment. This positive critical feedback provides a degree of validation of this research, according to Charmaz's (2006) description of four general criteria for evaluating empirical study and development of a theory: credibility; originality; resonance, and; usefulness. In keeping with the methods of grounded theory as described by Charmaz (2006) and Glaser (1978), an extensive and expansive review of historical and contemporary literature informing the analysis and development of new understandings further validate the theory that has emerged from this research.

At this point it is appropriate to note that the methods of transferring Māori knowledge and a Māori conservation ethic with its components are a taonga, a treasure, that may be useful for not only Māori as a consequence of this study, but for people of the global community. Tāngata whenua who have participated in this study have done so knowing the intent of the study as described in the purpose, and objectives in this thesis. While the data and results are part and parcel of an academic research process, the knowledge and practices and right to draw upon that taonga belongs with the tāngata whenua; the Māori People of Aotearoa-New Zealand.

The final challenge is the great separation that exists between dominant Western mainstream ways of understanding education and the indigenous 'other' – the alternative. It appears that the temptation is to leave the Māori

ways to Māori, without really understanding or attempting to understand what it is they represent and the potential that lies for all of us in understanding and embodying them. It is apparent that some indoctrinated in the ways of the West sense this potential, but cannot move beyond attempting to integrate a selection of the more acceptable ideas within an inadequate Western framework, which allows the usual marginalisation of the indigenous essence and predetermines limited and effective perpetuation of the status quo.

My journey as a pākehā educator has been to 'go there' and discover that rather than unfounded, superstitious, primitive mumbling and incantations, ā culture represents a logical, coherent, integrated view of the world based on peoples strong locally generated knowledge, that fits together not only in a comprehensive framework but in a framework that is better than what we have and are doing in contemporary mainstream EE/EfS at the moment, and for the past 50 years of the concentrated focus and expertise of the Western worlds' international leading expertise. I conclude this thesis with the call that it is about time that, rather than studying our combined history and human nature and duly writing about it, we actually demonstrate a destination for our journey of LEARNING.

I've made that journey as a pākehā and as an educator. Quite simply if I can, others can as well, should they so choose.

This thesis has advanced discussions on the significance of Māori cultural knowledge, understandings and perspectives, as well as contributing to knowledge of indigenous cultures. It has further contributed to several other pools of knowledge and understandings including education, environmental education and community resilience. Outcomes of this research have added value to both the academy and to the pool of applied knowledge towards the survival, resilience, well-being and continuance of humanity in the face of our greatest challenge.

BIBLIOGRAPHY:

A˚kerlind, G. S., & Kayrooz, C. (2010). *Understanding Academic Freedom: The Views of Social Scientists.* Higher Education Research & Development, Volume 22, Issue 3, pp. 327-344.

Abrams, F. (2010). *Learning to Fail: How Society Lets Young People Down.* Routledge, 2 Park Square, Milton Park, Abingdon, Oxon.

Ackoff, R. L. & Greenburg, D. (2008). *Turning Education Right Side Up: Putting Education Back on Track.* Wharton School Publishing.

Adamson, J. (2012). *Indigenous Literatures, Multinaturalism, and 'Avatar': The Emergence of indigenous Cosmopolitics.* American Literature History, Volume 24, Issue 1, pp. 143-162.

Adger, W. N., Huq, S., Brown, K., Conway, D. & Hulme, M. (2003). *Adaptation to Climate Change in the Developing World.* Progress in Development Studies, Volume 3, Number 3, pp. 179-195.

Agassiz, L. (1859). *An Essay on Classification.* London: Longman, Brown, Green, et al..

Agrawal, A. (1991). *Rural Resources: Relearning Civilization.* In Porritt, J. (1991) *Save the Earth,* London: Dorling Kindersley Limited, pp. 130-135.

Agrawal, A. (2005). *Environmentality: Technologies of Government and the Making of Subjects.* Second printing, Duke University Press, United States of America.

Agyeman, J. (2002). *Culturing Environmental Education: From First Nation Frustration.* Canadian Journal of Environmental Education, Volume 7, Issue 1, Spring.

Agyeman, J. (2003). *"Under-Participation" and Ethnocentrism in Environmental Education Research: Developing "Culturally Sensitive Research Approaches".* Canadian Journal of Environmental Education, Volume 8, Spring, 2003, pp. 80-94.

Aldrich, R. (2006). *Lessons from History of Education: The Selected Works of Richard Aldrich.* London: Routledge.

Aldrich, R. (2008). *Education for Survival: an Historical Perspective.* Department of Educational and Policy Studies, Institute of Education, University of London, London, United Kingdom.

Alexander, H. A. (2005). *Human Agency and the Curriculum.* In Slater Stern, B. & Kysilka, M. L. (Eds.) (2008), *Contemporary Readings in Curriculum.* Sage Publications, Inc., Thousand Oaks, California, United States of America.

Alexandridis, K., Maru, Y. Davies, J., Box, P. & Hueneke, H. (2009). *Constructing Semantic Knowledge Networks from the Ground Up: Livelihoods and Employment Outcomes in Anmatjere Region, Central Australia.* Proceedings, 18th World IMACS Congress and MODSIM09 International Congress on Modelling and Simulation: Interfacing Modelling and Simulation with Mathematical and Computational Sciences, pp. 2819-2825.

Al-Haqwi, A. I., Tamium, H. & Asery, A. (2010). *Knowledge, Attitude and Practice of Tobacco Smoking by Medical Students in Riyadh, Saudi Arabia.*

Ali, A. M. (2012). *Islamic Environmental Stewardship Through Aboriginal Spiritual Ecology: How Muslim Students Can Learn Stewardship Through Aboriginal Teachings.* A thesis submitted in conformity with the requirements for the degree of Master of Arts, Graduate Department of Adult Education and Counselling of Psychology, Ontario institute for Studies in Education, University of Toronto.
http://hdl.handle.net/1807/31981

Allen, J. F. Jr. (1970). *Education for Survival.* Paper presented to the annual meeting of the American Council of Learned Societies, Washington D.C., United States of America.

Allen, R. C. (2009). *The British Industrial Revolution in Global Perspective.* The Economic History Review, Volume 63, Issue 1, pp. 242-245.
DOI: 10.1111/j.1468-0289.2009.00511_7.x

Allender, J. S. & Allender, D. S. (2008). *The Humanistic Teacher: First the Child, Then the Curriculum.* Boulder, USA: Paradigm Publishers.

American Meteorological Society Planned and Inadvertent Weather Modification (1996). *A Policy Statement of the American Meteorological Society as Adopted by the Council on 5 January 1992.*
http://twm.co.nz/AMS_wxmod.html

Anderson, M. (1968). *The Wonderful World at my Doorstep: Mount Aldigus Station.* Wellington: A. H. & A. W. Reed.

Andrews, A. B. & Ben-Arieh, A. (1999). *Measuring and Monitoring Children's Well-being Across the World.* Social Work, Volume 44, Issue 2, March 1999, pp. 105-115.

Angell, D. J. R., Comer, J. D., Wilkinson, M. L. N. (Eds.) (1990). *Sustaining Earth: Response to the Environmental Threat.* London: MacMillan Academic and Professional Ltd.

Annals of Thoracic Medicine, Volume 5, Issue 3. Retrieved on 22 February 2013 from http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2930652/.

Anyan, S. (2010). *The Common Sense Guide to Choosing a Secondary School.* North and South Magazine, November 2010, New Zealand.

Arce, M. D. G. (2001). *Leadership and the Aggregation of International Collective Action.* Oxford Economic Papers, Volume 53, Issue 1, pp. 114-137.

Armstrong, S. J. & Botzler, R. G. (1993). *Environmental Ethics: Divergence and Confluence.* New York: McGraw-Hill, Inc.

Arnold, G. (2012). *Enhancing College Students' Environmental Sensibilities Through Online Nature Journaling.* Environmental Education Research, Volume 18, Issue 1, pp. 133-150. DOI: 10.1080/13504622.2011.589000.

Aronson, J., Blignaut, J. N., De Groot, R. S., Clewell, A., Lowry II, P. P., Woodworth, P., Cowling, R. M., Renison, D., Farley, J., Fontaine, C., Tongway, D., Levy, S., Rangel, O. Debrincat, B. & Birkinshaw, C. (2010). *The Road to Sustainability Must Bridge Three Great Divides.* Annals of the New York Academy of Sciences, Volume 1185, January 2010, pp. 225-236.

Arthur, M. (2011). *Development of Action Competence using Education for Sustainability in New Zealand Schools.* A thesis submitted for fulfilment of the requirements for the degree of Master of Science at the University of Waikato, New Zealand.

Ash, N., Blanco, H., Brown, C., Garcia, K., Henrichs, T., Lucas, N., Raudsepp-Hearne, C., Simpson, R. D., Scholes, R., Tomich, T., Vira, B., & Zurek, M., (Eds.), (2010). *Ecosystems and Human Well-being: a Manual for Assessment Practitioners.* Washington DC: Island Press.

Ashton, T. S. (1997). *The Industrial Revolution 1760-1830.* Oxford University Press.

Assmann, J. & Czaplicka, J. (1995). *Memory and Cultural Identity.* New German Critique, Volume 65, Cultural History/Cultural Studies, pp. 125-133. Retrieved on 23 August, 2013 from http://www.jstor.org/stable/pdfplus/488538.pdf

Attenborough, D. (1979). *Life on Earth: A Natural History.* London: Collins.

Attenborough, D. (1984). *Living Planet: A Portrait of the Earth*. Boston: Little Brown.

Attenborough, D. (1991). *Introduction* in Porritt, J. (1991) *Save the Earth.* London: Dorling Kindersley Limited..

Attenborough, D. (2010). *Attenborough's Journey*. Video disc, Atlantic Productions.

Attenbourough, D. (2011). Quote in *They Said It,* Otago Daily Times, New Zealand, Friday, 9 December 2011.

Auckland Regional Council *(2006). Forces Shaping the 21st Century: World Views.* June 2006. http://www.arc.govt.nz/albany/fms/main/Documents/Auckland/Sustainability/World%20views.pdf

Australian Geographic, (2011). *Australian Aboriginals: the Oldest Culture on Earth.* Nationalhttp://www.australiangeographic.com.au/journal/Aboriginal-Australians-the-oldest-culture-on-Earth.htm

Ayim, M. (1974). *Retroduction: the Rational Instinct.* Transactions of the Charles S. Peirce Society, Volume 10, Number 1, pp. 34-43.

Bader, R. (1993). *Overcoming False Public Beliefs – Possible Strategies for Improving Environmental Risk Literacy.* Toxicological and Environmental Chemistry, Volume 40, Issue 1-4, pp. 275-288.

Baker, D. P. & Wiseman, A. W. (Eds.) (2005). *Global Trends in Educational Policy.* International Perspectives on Education and Society, Volume 6. Oxford, UK: Elsevier Limited.

Baker, M. (2010). *The Korowai Framework: Assessing GE Through the Values the ART Confederation Associates with Ngārara.* A thesis submitted to the Victoria University of Wellington in fulfilment of the requirements for the degree of Master's in Environmental Science.

Baker, S. J. (1945). *Origins of the Words Pākehā and Māori.* The Journal of the Polynesian Society, Volume 54, Number 4, pp. 223-231. Retrieved on 18 October, 2013 from http://www.jps.auckland.ac.nz/document/Volume_54_1945/Volume_54,_No._4/Origins_of_the_words_Pākehā_and_Māori,_by_Sidney_J._Baker,_p_223-231/p1

Bamberg, S. & Möser, G. (2007). *Twenty Years After Hines, Hungerford, and Tomera: A New Meta-analysis of Psycho-social Determinants of Pro-environmental Behaviour.* Journal of Environmental Psychology, Volume 27, issue 1, pp. 14-25.

Bandura, A. (1977). *Social Learning Theory.* Oxford, England: Prentice-Hall.

Banner, L. W. (1973). *Religious Benevolence as Social Control: A Critique of an Interpretation.* The Journal of American History, Volume 60, Issue 1, pp. 23-41. http://www.jstor.org/discover/10.2307/2936327?uid=3738776&uid=2&uid=4&sid=47698826618967

Barlow, C. (1991). *Tikanga Whakaaro: Key Concepts in Māori Culture.* Oxford University Press.

Barnes, H. M., McCreanor, T. & Haukau, J. (2008). *Māori and the New Zealand Values Survey: The Importance of Research Relationships.* Kōtuitui: New Zealand Journal of Social Sciences Online, 2008, Volume 3, pp. 135-147. 117-083X/08/0302-0135.

Barr, S. (2008). *Environmental and Society: Sustainability, Policy and the Citizen.* Hampshire, England: Ashgate Publishing Limited.

Barraza, L. & Cuarón, A. D. (2004). *How Values in Education Affect Children's Environmental Knowledge.* Journal of Biological Education, Volume 39, Issue 1, pp. 18-23.

Barry, W. (2006). *Response to the Draft New Zealand Curriculum by Environmental Education and Education for Sustainability Leaders.* Wellington, WWF-New Zealand.

Barton, D. (2011). *Capitalism for the Long Term.* Retrieved from the Harvard Business Review: The Magazine, March 2011 on 22 July, 2012 from http://hbr.org/2011/03/capitalism-for-the-long-term/ar/1.

Basit, T. (2003). *Manual or Electronic? The Role of Coding in Qualitative Data Analysis.* Educational Research, Volume 45, pp. 143-154.

Baskeran, A. & Boden, R. (2004). *Science: A Controversial Commodity*. Science Technology Society March, Volume 9, Number 1, pp. 1-26. http://sts.sagepub.com/content/9/1/1.full.pdf+html

Bates, H. W.(1915). *The Naturalist on the River Amazons.* John Murray: London.

Baumgartner, F. R. & Leech, B. L. (1998). *Basic Interests: The Importance of Groups in Politics and Political Science.* Princeton, New Jersey, USA: Princeton University Press.

Bawden, R. J. (2001). *Educating for Unity Through Diversity of Knowing: A Systemic Perspective.* In Campbell, J. (Ed.) (2001), *Creating Our Common Future: Educating for Unity in Diversity.* Published jointly by the United Nations Educational, Scientific and Cultural Organization, and Berghahn Books, United States of America, pp. 79-100.

Beaumont, C. & Berger, J. (1974). *Earthquake Prediction: Modification of the Earth Tide Tilts and Strains by Distancy.* Geophysical Journal of the Royal Astronomical Society, Volume 39, Issue 1, pp. 111-121. http://onlinelibrary.wiley.com/doi/10.1111/j.1365-246X.1974.tb05441.x/abstract

Beddington, J. (1991). *Oceans and Seas: Failing Fisheries.* In Porritt, J. (1991) *Save the Earth.* London: Dorling Kindersley Limited.

Bekerman, Z. & Kopelowitz, E. (Eds.) (2008). *Cultural Education – Cultural Sustainability: Minority, Diaspora, Indigenous, and Ethno-Religious Groups in Multicultural Societies.* New York: Routledge.

Bell, A. (1991). *Some Like It Hot: Limits to the Media's Role in Environmental Education.* In D. Springett & C. Michael Hall (Eds.) *Our Common Future: the Way Forward, The Proceedings of the New Zealand Natural heritage Foundation International Conference on Environmental Education, Palmerston North, New Zealand, 26-30 August, 1991*, pp. 61-64. New Zealand Natural Heritage Foundation.

Bellamy, D. & Quayle, B. (1986). *Turning the Tide: Exploring Options for Life on Earth.* London: Collins.

Bellamy, D. (1991). *Wetlands: Draining the World Dry.* In Porritt, J. (1991) *Save the Earth.* London: Dorling Kindersley Limited.

Bender, K., Thompson, S. J., McManus, H., Lantry, J. & Flynn, P. M. (2007). *Capacity for **Survival**: Exploring Strengths of Homeless Street Youth.* Child and Youth Care Forum, Volume 36, Issue 1, February 2007, pp. 25-42.

Beniers, K. J. & Dur, R. (2007). *Politicians' Motivation, Political Culture, and Electoral Competition.* International Tax and Public Finance, Volume 14, Number 1, pp. 29-54. http://www.springerlink.com/content/y876871mj182r8vj/

Bentley, M. L. (2010). *Environmental Education in an Age of National Standards and Videophilia.* Science Education Review, Volume 9, Number 2, pp. 70-79.

Berg, B. L. (2004). *Qualitative Research Methods for the Social Sciences, 5th Edition.* Boston: USA: Pearson/Allyn & Bacon.

Berkes, F. & Ross, H. (2013). *Community Resilience: Toward an Integrated Approach.* Society and Natural Resources: An International Journal, Volume 26, Issue 1, pp. 5-20. DOI: 10.1080/08941920.2012.736605.

Besley, T. (2005). *Political Selection.* Journal of Economic Perspectives, Volume 19, Number 3, Summer 2005, pp. 43-60. http://www.jstor.org/stable/10.2307/4134972

Best, E. (1992). *The Astronomical Knowledge of the Māori.* Dominion Museum, Wellington, New Zealand.

Birdsall, S. (2010). *Empowering Students to Act: Learning About, Through and From the Nature of Action.* Australian Journal of Environmental Education, Volume 26, pp. 65-84.

Birdsall, S. (2011). *The Pedgogical Realisation of Education for Sustainability.* A thesis submitted in fulfilment of the requirements for the degree of Doctor of Philosophy (Education) at the University of Auckland, New Zealand. Retrieved on 12 February, 2014 from https://researchspace.auckland.ac.nz/bitstream/handle/2292/10326/whole.pdf?sequence=8

Bishop, R. (2003). *Changing Power Relations in Education: Kaupapa Māori Messages for 'Mainstream' Education in Aotearoa/New Zealand [1].* Comparative Education, Volume 39, Issue 2, 2003, pp. 221-238.

Bishop, R., Berryman, M., Cavanagh, T. & Teddy, L. (2009). *Te Kotahitanga: Addressing Educational Disparities Facing Māori Students in New Zealand.* Teaching and Teacher Education, Volume 25, Issue 5, July 2009, pp. 734-742.

Björneloo, I. & Nyberg, E. (Eds.) (2007). *Drivers and Barriers for Implementing Learning for Sustainable Development in Pre-School through Upper Secondary and Teacher Education.* Education for Sustainable Development in Action Technical Paper Number 4, UNESCO Education Sector. Retrieved on 21 May 2012 from http://ukmaburbanforum.co.uk/docunents/other/150966E.pdf#page=112

Blakeley, R. (1991). *Environmental Policy in New Zealand.* In D. Springett & C. Michael Hall (Eds.) *Our Common Future: the Way Forward.* Proceedings of the New Zealand Natural Heritage Foundation International Conference on Environmental Education, Palmerston North, New Zealand, 26-30 August, 1991. New Zealand Natural Heritage Foundation, pp. 24-28.

Blewitt, J. & Cullingford, C. (Eds.) (2004). *The Sustainability Curriculum: The Challenge for Higher Education.* London, UK: Earthscan.

Blewitt, J. (2004). *Sustainability and Lifelong Learning.* In Blewitt, J. & Cullingford, C. (Eds.) (2004). *The Sustainability Curriculum: The Challenge for Higher Education.* London, UK: Earthscan, pp. 13-23.

Blewitt, J. (2006). *The Ecology of Learning: Sustainability, Lifelong Learning and Everyday Life.* London: Earthscan.

Blumstein, D. T. & Saylan, C. (2007). *The Failure of Environmental Education (and How We Can Fix It).* PLoS Biol 5(5): e120. Doi:10.1371/journal.pbio.0050120.

Bolstad, R. (2003). *Environmental Education: Roots in the Past, Visions of the Future, Opportunities in the Present.* SET: Research Information for Teachers, 3. New Zealand Council For Educational Research.

Bolstad, R., Baker, R., Barker, M. & Keown, P. (2004a) *Environmental Education in New Zealand Schools: Research into Current Practice and Future Possibilities.* Volume 2: A Review of National and International Research Literature on Environmental Education Practices. Wellington: Ministry of Education.

Bolstad, R., Cowie, B. & Eames, C. (2004b). *Environmental Education in New Zealand Schools: Research into Current Practice and Future Possibilities.* Volume 1: Summary of the Research Findings. Wellington: Ministry of Education.

Bolstad, R., Eames, C. & M. Robertson, (2008). *The State of Environmental Education in New Zealand: A baseline assessment of provision in the formal education sector in 2006*. WWF-New Zealand, Wellington, New Zealand. Retrieved on 28 June 2010 from http://awsassets.wwfnz.panda.org/downloads/state_environmental_education_nzschools.pdf

Bombay, A., Matheson, K. & Anisman, H. (2010). *Decomposing Identity: Differential Relationships Between Several Aspects of Ethnic Identify and the Negative Effects of Perceived Discrimination among First Nations Adults in Canada.* Cultural Diversity and Ethnic Minority Psychology, Volume 16, Issue 4, pp. 507-516.

Bonnett, M. (1999). *Education for Sustainable Development: A Coherent Philosophy for Environmental Education?* Cambridge Journal of Education, Volume 29, Issue 3, pp. 313-324. Retrieved on 13 April 2012 from http://www.tandfonline.com/doi/abs/10.1080/0305764990290302

Bonnett, M. (2002). *Education for Sustainability as a Frame of Mind.* Environmental Education Research, Volume 8, Issue 1, pp. 9-20. Retrieved on 26 April 2012 from http://www.tandfonline.com/doi/abs/10.1080/13504620120109619

Bonnett, M. (2007). *Environmental Education and the Issue of Nature.* Journal of Curriculum Studies, Volume 39, Issue 6, pp. 707-721. Retrieved on 11 September 2012 from http://www.tandfonline.com/doi/abs/10.1080/00220270701447149

Bonnett, M. (2008). *Education for Sustainability as a Frame of Mind.* In Reid, A. & Scott, W. (Eds.) (2008). *Researching Education and the Environment: Retrospect and Prospect.* Oxon: Routledge, pp. 19-30.

Booth, A. L. & Jacobs, H. M. (1990). *Ties That Bind: Native American Beliefs as a Foundation for Environmental Consciousness.* Environmental Ethics, Volume 12, pp. 27-43. In Armstrong, S. J. & Botzler, R. G. (1993), *Environmental Ethics: Divergence and Confluence,* New York: McGraw-Hill, Inc., pp. 519-526.

Boulton, K. R. (2010). *Rivalry over Water Resources as a Potential Cause of Conflict in Asia.* Journal of Social, Political, and Economic Studies, Volume 35, Issue 1, pp. 23-44.

Bowers, C. A. (1993). *Education, Cultural Myths, and the Ecological Crisis.* Albany, USA: State University of New York Press.

Bowers, C. A. (1999). *Changing the Dominant Cultural Perspective in Education.* In Smith, G. A. & Williams, D. R. (1999), *Ecological Education in Action: on Weaving Education, Culture and the Environment*. New York: State University of New York Press, pp. 161-178.

Bowl, M. & Tobias, R. (2011). *Learning From the Past, Organizing for the Future: Adult and Community Education in Aotearoa New Zealand.* Retrieved on 21 July, 2011 from Sage Journals Online, http://aeq.sagepub.com/content/early/2011/29/0741713611403830

Boykoff, M. T. (2013). *Public Enemy No.1?: Understanding Media Representations of Outlier Views on Climate Change.* American Behavioural Scientist, Volume 57, Issue 6, pp. 691-698. Retrieved on 28 September 2013 from http://abs.sagepub.com/content/57/6/796.full.pdf+html

Braun, D. (1998). *The Role of Funding Agencies in the Cognitive Development of Science.* Research Policy, Volume 27, Issue 8, pp. 807-821. Retrieved on 12 August 2011 from http://www.sciencedirect.com/science/article/pii/S0048733398000924

Brennan, (1964). Cited in G. B. Scott (1986) *School Based Environmental Education in New Zealand: Conceptual Issues and Political Implications, Volume One: Text.* A Thesis submitted in fulfilment of the requirements for the degree of Doctor of Philosophy in Resource Management in the University of Canterbury, University of Canterbury, Christchurch, New Zealand, pp. 1-12.

Brennan, A. (1994). *Environmental Literacy and Educational Ideal.* Environmental Values, Volume 3, Issue 1, pp. 3-16.

Brennan, M. J. (1974). *Total Education for the Total Environment.* Paper presented at the annual meeting of the American Association for the advancement of Science in Montreal, Quebec, Canada, December, 1964. Reprinted in Journal of Environmental Education, 6(1), 16-19.

Brian, B.C. (2007). *Science, Spirituality and Holism Within Higher Education.* International Journal of Innovation and Sustainable Development, Volume 2, Issue 3-4, April 2007, pp. 332-339.

Brignall-Theyer, M., Allen, W. & Taylor, R. (2009). *Education for Sustainability (EfS) in the New Zealand Secondary School System: A Scoping Study*. Landcare Research Internal Report/ LC0809/123. http://www.landcareresearch.co.nz/publications/researchpubs/education_report_allen.pdf

Brown, D. & Thomson, C. (2000). *Cooperative Learning In New Zealand Schools.* Palmerston North, New Zealand: Dunmore Press Limited.

Brown, L. (1991). *Croplands: Blowing in the Wind.* In Porritt, J. (1991), *Save the Earth.* London: Dorling Kindersley Limited.

Brown, L. (2004). *Environmental Education in Secondary Schools: Priorities for Teachers.* Conference Presentation: New Zealand Association for Environmental Education Conference, 2004.

Brown, L. (Ed.) (1993). *The New Shorter Oxford English Dictionary on Historic Principle.* Volume One, A-M. Oxford: Clarendon Press.

Brown, S. (Ed.) (1997). *Open and Distance Learning: Case Studies from Industry and Education.* Open and Distance Learning Series. London: Kogan Kage Limited.

Bruce, J. & Bongaarts, J. (2010). *The New Population Challenge*. In Mazur, L. (Ed.) (2010). *A Pivotal Moment: Population, Justice, and The Environmental Challenge.* Washington, D.C.: Island Press, pp. 260-275.

Brundtland, G. H. (1987). *Presentation of the Report of the World Commission on Environment and Development to UNEP's Fourteenth Governing Session*. World Commission on Environment and Development.

Brundtland, G. H. (1990). *Foreword* in Angell D. J R, Comer J. D. & Wilkinson M. L. N. (Eds.) (1990), *Sustaining Earth: Response to the Environmental Threat.* London: Macmillan Academic and Professional Ltd..

Budyko, M. I. (1969). *The Effect of Solar Radiation Variations on the Climate of the Earth.* Tellus, Volume 21, Issue 5, pp. 611-619. Retrieved on 11 August 2011 from http://onlinelibrary.wiley.com/doi/10.1111/j.2153-3490.1969.tb00466.x/abstract

Bunker, L. K. (1991). *The Role of Play and Motor Skill Development in Building Children's Self-Confidence and Self-Esteem.* The Elementary School Journal, Volume 91, Number 5, pp. 467-471. Chicago: The University of Chicago Press. Retrieved on 23 July 2011 from http://www.jstor.org/stable/10.2307/1001887

Burger, J. (1990). *The Gaia Atlas of First Peoples: A Future for the Indigenous World.* Penguin Books, Ringwood.

Burkhart, H. (1997). *Priorities for a Sustainable Civilization.* Unpublished Paper. Toronto: Department of Physics, Ryerson Polytechnic University.

Burnett, J. (2007). *A Pleasurable Path to Literacy: Can Steiner Contribute to the Literacy Debate?* Journal of Early Childhood Literacy, Volume 7, Issue 3, December 2007, pp. 321-331.

Burrell, G. & Morgan, G. (1979). *Sociological Paradigms and Organisational Analysis.* London: Heinemann.

Burroughs, E. R. (1914). *Tarzan of the Apes.* A. C. McClurg & Co., Chicago. Retrieved on 18 August 2010 from http://www.archive.org/stream/tarzanapes00compgoog#page/n4/mode/2up

Buss, D. M. & Craik, K. H. (2006). *Contemporary Worldviews: Personal and Policy Implications.* Journal of Applied Social Psychology, Volume 13, Issue 3, pp. 259-280. Retrieved on 24 November 2011 from http://onlinelibrary.wiley.com/doi/10.1111/j.1559-1816.1983.tb01739.x/abstract

Butler, S. (1863). *A First Year in Canterbury Settlement; With Other Essays.* London: Reissued by Jonathan Cape (1923).

Cachelin, A., Norvell, R. & Darling, A. (2010). *Language Fouls in Teaching Ecology: Why Traditional Metaphors Undermine Conservation Literacy.* Conservation Biology, Volume 24, Issue 3, pp. 669-674.

Cairns, J., Jr. (2001). *Setting Ecological Restoration Goals for Technical Feasibility and Scientific Validity.* Ecological Engineering, Volume 15, Issue 3-4, pp. 171-180.

Cairns, J., Jr. (2001). *Healing the World's Ecological Wounds.* International Journal of Sustainable Development and World Ecology, Volume 8, Issue 3, pp. 185-189.

Cairns, J., Jr. (2007). *Sustainable Co-evolution.* International Journal of Sustainable Development and World Ecology, Volume 14, Issue 1, pp. 103-108.

Cajete, G. (1999). *Reclaiming Biophilia: Lessons from Indigenous Peoples.* In Smith, G. A. & Williams, D. R. (1999), *Ecological Education in Action: on Weaving Education, Culture and the Environment*. State University of New York: New York Press, pp. 189-206.

Cameron, J. (Dir.), Worthington, S., Saldana, Z. & Weaver, S. (Perf.) (2009). *Avatar.* Twentieth Century Fox Film Corporation.

Campbell, E. M. (2001). *Educating for a Humane Society.* In Campbell, J. (Ed.) (2001), *Creating Our Common Future: Educating for Unity in Diversity.* Published jointly by the United Nations Educational, Scientific and Cultural Organization, and Berghahn Books, United States of America, pp. 101-121.

Campbell, J. (Ed.) (2001). *Creating Our Common Future: Educating for Unity in Diversity.* Published jointly by the United Nations Educational, Scientific and Cultural Organization, and Berghahn Books, United States of America.

Campbell, J., McMeniman, M. M. & Baikaloff, N. (2001). *A Working Consensus on a Desirable Future: An Australian Case-Study.* In Campbell, J. (Ed.) (2001), *Creating Our Common Future: Educating for Unity in Diversity.* Published jointly by the United Nations Educational, Scientific and Cultural Organization, and Berghahn Books, United States of America, pp. 29-44.

Carpenter, S., Walker, B., Anderies J. M., & Abel, N. (2001). *From Metaphor to Measurement: Resilience of What to What?* Ecosystems, Volume 4, pp. 765-781.

Carruthers, J. (2009). *National Parks in South Africa.* In Suich, H., Child, B. & Spenceley, A. (2009), *Evolution and Innovation in Wildlife Conservation: Parks and Game Ranches to Transfrontier Conservation Areas*. Earthscan, pp. 35-49.

Carson, R. (1963). *Silent Spring.* London [England]: Hamish Hamilton, c1962.

Carter, R. L. & Simmons, B. (2010). *The History and Philosophy of Environmental Education.* The Inclusion of Environmental Education in Science Teacher Education, Part 1, pp. 3-16. Retrieved on 12 July 2010 from http://www.niu.edu/~carter/courses/520/Carter_Simmons.pdf

Castells, M. (2010). *The Power of Identity: The Information Age*. Economy, Society, and Culture, Volume II, Second edition. Willey-Blackwell, United Kingdom. Retrieved on 18 July 2010 from http://gendocs.ru/docs/10/9373/conv_1/file1.pdf

Catt, H. & Murphy, M. (2010). *What Voice for the People? Categorising Methods for Public Consultation.* Australian Journal of Political Science, Volume 38, Issue 3, 2003, pp. 407-421.

Centre for Education Research and Innovation (1995). *Environmental Learning for the 21st Century.* Organisation for Economic Co-operation and Development, Paris, France.

Chapman, D. (2003). *Education for the Environment – Hang on a Minute Mate.* New Zealand Journal of Geography, Issue 21.

Chapman, D. (2004a). *Sustainability and Our Cultural Myths.* Canadian Journal of Environmental Education, Issue 9, pp. 92-108.

Chapman, D. (2004b). *Curriculum: Sitting on the Fault Line.* New Zealand Journal of Teachers' Work, Volume 1, Issue 2, pp. 74-79.

Chapman, D. (2004c). *Environmental Education and Politics: Snakes and Ladders Revisited.* Australian Journal of Environmental Education, Volume 20, Issue 2, pp. 23-30.

Chapman, D. (2006). *Teaching Values: Naïve or Cynical?* New Zealand Journal of Teachers' Work, Volume 3, Issue 2, pp. 90-96.

Chapman, D. (2007). *Education for Sustainability: Looking for Directions.* In Björneloo, I. & Nyberg, E. (Eds.) (2007). *Drivers and Barriers for Implementing Learning for Sustainable Development in Pre-School through Upper Secondary and Teacher Education.* Education for Sustainable Development in Action Technical Paper Number 4, UNESCO Education Sector. Retrieved on 21 May 2012 from http://ukmaburbanforum.co.uk/docunents/other/150966E.pdf#page=112

Chapman, D. (2011). *Environmental Education and the Politics of Curriculum: A National Case Study.* The Journal of Environmental Education, Volume 42, Issue 3, pp. 193-202.

Chapman, D., & Eames, C. (2007). *Position Paper: Backgrounding New Guidelines for EE/EfS*. Retrieved on 12 July 2008 from http://www.nzaee.org.nz/efs_position_paper.htm

Chapman, D., Flaws, M. & Le Heron, R. (2006). *A Due Diligence Report on New Zealand's Educational Contribution to the UN Decade for Sustainable Development.* Journal of Geography in Higher Education, Volume 30, Issue 2, pp. 281-292.

Charles, C. (1996). *Ecological Literacy is Not Enough.* International Research in Geographical and Environmental Education, Volume 5, Issue 2, pp. 133-135.

Charmaz, K. (2006). *Constructing Grounded Theory: A Practical Guide through Qualitative Analysis.* London: Sage Publications.

Charmaz, K. (2014). *Constructing Grounded Theory: A Practical Guide through Qualitative Analysis, 2nd Edition.* London: Sage Publications.

Chawla, L. (1998). *Significant Life Experiences Revisited: A Review of Research on Sources of Environmental Sensitivity.* The Journal of Environmental Education, Volume 29, Issue 3, pp. 11-21.

Chepesiuk, R. (2007). *Environmental Literacy: Knowledge for a Healthier Public.* Environ Health Perspect 115: A494-A499. DOI: 10.1289/ehp.115-a494.

Cheung, M. (2008). *The Reductionist – Holistic Worldview Dilemma.* MAI Review, Volume 3, Research Note 5. Retrieved on 2 April 2013 from http://www.review.mai.ac.nz

Chinn, P. W. U. (2007). *Decolonizing Methodologies and Indigenous Knowledge: The Role of Culture, Place and Personal Experience in Professional Development*. Journal of Research in Science Teaching, Volume 44, Issue 9, pp. 1247-1268.

Chisolm, M. S., Brigham, E. P., Lookatch, S. J., Tuten, M., Strain, E. C. & Jones, H. E. (2010). *Cigarette Smoking Knowledge, Attitudes, and Practices of Patients and Staff at a Perinatal Substance Abuse Centre.* Journal of Substance Abuse Treatment, Volume 39, Issue 3, pp. 298-305. Retrieved on 28 February 2013 from http://www.sciencedirect.com/science/article/pii/S0740547210001352.

Chisolm, R. M. (1989). *Theory of Knowledge.* 3rd Edition. Englewood Cliffs, New Jersey: Prentice Hall.

Cicourel, A. V., (1964). Method and Measurement in Sociology. New York: Free Press. Cited in W. Handel (1982), *Ethnomethodology: How People Make Sense.* Englewood Cliffs, New Jersey: Prentice-Hall, Inc..

Cifrić, I. (1996). *Environmental Literacy between Cultural Tradition and Environmental Routine.* Socijalna Ekologija, Volume 5, Issue 3, pp. 403-421.

Clark, J. L. (1985). *Thus Spoke Chief Seattle: The Story of An Undocumented Speech.* Prologue Magazine, Volume 18, Number 1, Spring 1985. National Archives, United States of America. Retrieved on 11 April 2011 from http://www.archives.gov/publications/prologue/1985/spring/chief-seattle.html

Club of Budapest: Worldshift Network (2008). *State of Global Emergency Declaration (Draft).* Prepared by Ervin Laszlo and David Woolfson for the Club of Budapest Worldshift Foundation, Neuss, Germany. Retrieved on 23 May 2011 from http://www.worldshiftnetwork.org/declaration/index.html

Club of Rome (1972). *Limits to Growth: A Report for the Club of Rome's Project on the Predicament of Mankind*. By Donella H. Meadows and others. New York: Universe Books.

Club of Rome (1977a). *Goals for Mankind: A report to the Club of Rome.* Edited by Erin Laszlo. London: Hutchinson.

Club of Rome (1977b). *Goals in a Global Community: the Original Background Papers for Goals for Mankind, a Report to the Club of Rome*. Edited by Erin Laszlo and Judah Bierman. New York: Pergamon Press.

Club of Rome (1979). *No Limits to Learning: Bridging the Gap: A Report to the Club of Rome.* By James Botkin, Mahdi Elmandjra & Mircea Malitza. Oxford; New York: Permagon Press.

Club of Rome (1995). *Taking Nature Into Account: A Report to the Club of Rome: Toward a Sustainable National Outcome.* Edited by Wouter van Dieren. New York: Copernicus.

Codburn, J. (2009). *Responsible Humans: Identifying Community Leaders and Building Sustainable Organisations.* New Zealand Resilience Trust. Retrieved on 12 October, 2012 from http://www.communityresearch.org.nz/wp-content/uploads/formidable/Responsible-Humans-WCDM-paper-2009.pdf .

Cole, A. G. (2007). *Expanding the Field: Revisiting Environmental Education Principles through Multidisciplinary Frameworks.* Journal of Environmental Education, Volume 38, Issue 2, pp. 35-44.

Commission for the Environment (1986). *Submission to the Committee of Inquiry into Curriculum, Assessment and Qualifications in Forms 5 to 7*. Wellington: Commission for the Environment.

Connor, B. & Drury, S. (1980). *Toward Self-sufficiency: Country Skills for City Dwellers.* Sydney: Australia & New Zealand Book Company.

Cooper, G. (2010) *Part Four: Report on Mātauranga Taiao.* Education for Sustainability in New Zealand Schools. http://edcounts.squiz.net.nz/__data/assets/pdf_file/0010/82909/947d_Part4-Matauranga-Taiao.pdf

Cooper, M., Manhire, J., Dann, C., Reider, R., Morris, M. & Rosin, C. (2012). *The New Zealand Organic Market Report 2012.* Organics Aotearoa New Zealand.

Corti, S., Molteni, F. & Palmer, T. N. (1999). *Signature of Recent Climate Change in Frequencies of Natural Atmospheric Circulation Regimes.* Nature, Volume 398, pp. 799-802. Retrieved on 12 October, 2011 from http://www.nature.com/nature/journal/v398/n6730/full/398799a0.html?free=2

Cowie, B., Eames, C. Harlow, A. Bolstad, R., with, Barker, M. Keown, P. *et al*. (2004). *Environmental Education in New Zealand Schools: Research into Current Practice and Future Possibilities.* Volume 3: A critical stocktake of the characteristics of effective practice in environmental education in New Zealand schools and kura kaupapa Māori. Wellington, New Zealand: Ministry of Education.

Coyle, K. (2005). *Environmental Literacy in America: What Ten Years of NEETF/Roper Research and Related Studies Say about Environmental Literacy in the U.S..* The National Environmental Education and Training Foundation, Washington D.C., USA. Retrieved on 8 March 2011 from http://www.neefusa.org/pdf/ELR2005.pdf

Craig, J., Anderson, S., Clout, M., Creese, B., Mitchell, N., Odgen, J., Roberts, M. & Ussher, G. (2000). *Conservation Issues in New Zealand. Annual Review of Ecologuy and Systematics,* pp. 61-78. Retrieved on 12 May 2014 from http://www.annualreviews.org/doi/abs/10.1146/annurev.ecolsys.31.1.61

Crick, F. (1988). *What Mad Pursuit: A Personal View of Scientific Discovery.* Harper-Collins.

Cullingford, C. (2004). *Conclusion: The Future: Is Sustainability Sustainable?* In Blewitt, J. & Cullingford, C. (Eds.) (2004). *The Sustainability Curriculum: The Challenge for Higher Education.* London, UK: Earthscan, pp. 245-252.

Cunningham, P. (1989). *Educational History and Educational Change: The Past Decade of Educational Historiography.* History of Education Quarterly, Vol. 29, No. 1, Spring, 1989, pp. 77-94.

Curtin, S. (2009). *Wildlife Tourism: The Intangible, Psychological Benefits of Human- Wildlife Encounters.* Current issues in Tourism, Volume 12, Issue 5-6, 2009, pp. 451-474.

Cusick, J. (2008). *Study Abroad in Support of Education for Sustainability: A New Zealand Case Study.* Springer Science+business media B.V. 2008. Doi: 10.1007/s100668-008-9144-5.

Cutcliffe, J. R. & McKenna, H. P. (2004). *Expert Qualitative Researchers and the use of Audit Trails.* Journal of Advanced Nursing, Volume 45, Issue 2, pp 126-133.

Dabbs, J. M., Jr. (1982). *Making Things Visible.* In Van Maanen, J. (Ed.) (1982), *Vaireties of Qualitative Research.* Beverley Hills: Sage.

Dahlin, B. (2009). *On the Path Towards Thinking: Learning from Martin Heidegger and Rudolph Steiner.* Studies in Philosophy and Education, Volume 28, Issue 6, November 2009, pp. 537-554.

Dahlin, B. (2010). *A State-Independent Education for Citizenship?: Comparing Beliefs and Values Related to Civic and Moral Issues Among Students in Swedish Mainstream and Steiner Waldorf Schools.* Journal of Beliefs and values, Volume 31, Issue 2, August 2010, pp. 165-180.

Daniels, S. E. & Walker, G. B. (1996). *Collaborative Learning: Improving Public Deliberation in Ecosystem-based Management.* Environmental Impact Assessment Review, Volume 16, Issue 2, pp. 71-102.

Darwin, C. (1859). *On the Origin of the Species.* Electronic resource. Oxford University Press, UK, 2008.

Daudet, Y. & Singh, K. (2001). *The Right to Education: An Analysis of UNESCO's Standard-setting Instruments.* Education Policies and Strategies 2, UNESCO, Paris. Retrieved on 15 April 2011 from http://unesdoc.unesco.org/images/0012/001238/123817e.pdf

Daudi, S. S. (2008). *Environmental Literacy: A System of Best-fit for Promoting Environmental Awareness in Low Literate Communities.* Applied Environmental Education and Communication, Volume 7, Issue 2, pp. 76-82.

Davidson, J. (2003). *Citizenship and Sustainability in Dependent Island Communities: The Case of the Huon Valley Region in Southern Tasmania.* Local Environment, Volume 8, Issue 5, pp. 527-540.

Davidson, D. J. (2010). *The Applicability of the Concept of Resilience to Social Systems: Some Sources of Optimism and Nagging Doubts.* Society and Natural Resources: An International Journal, Volume 23, Issue 12, pp. 1135-1149. Retrieved on 13 August 2011 from http://dx.doi.org/10.1080/08941921003652940.

Davies, K. (2010). *Sustainable Minds.* Alternatives Journal, Volume 36, Issue 5, pp. 8-11.

Davis, G. F. & Kim, E. H. (2005). *Would Mutual Funds Bite the Hand that Feeds Them? Business Ties and Proxy Voting.* Business Ties and Proxy Voting, February 15, 2005. Retrieved on 3 May 2011 from http://dx.doi.org/10.2139/ssrn.667625.

Davis, J. (2009). *Revealing the Research 'Hole' of Early Childhood Education for Sustainability: A Preliminary Survey of the Literature.* Environmental Education Research, Volume 15, Issue 2, pp. 227-241. Retrieved on 20 August 2011 from http://www.tandfonline.com/doi/abs/10.1080/13504620802710607

Davis, Te A. (1991). *Envisioning the Future: Māori Conservation Ethics*. Keynote paper delivered as part of proceedings of the New Zealand Heritage Foundation International Conference on Environmental Education (1991) at Massey University. Massey University Printery, Palmerston North, New Zealand.

Davis, W. (2003). *Dreams of Endangered Cultures*. Presentation, TED2003, filmed February 2003, posted January 2007. Retrieved on 25 July 2010 from http://www.ted.com/talks/wade_davis_on_endangered_cultures.html

Davis, W. (2008). *The Worldwide Web of Belief and Ritual.* Presentation, TED2008, filmed February 2008, posted June 2008. Retrieved on 25 July 2010 from *http://www.ted.com/talks/wade_davis_on_the_worldwide_web_of_belief_a*

Day, J. A., Fost, F. F. & Rose, P. (1971). *Dimensions of the Environmental Crisis.* John Wiley & Sons Inc.

Day, J. C., Gunton, T. I. & Frame, T. M. (2003). *Toward Environmental Sustainability in British Columbia: The Role of Collaborative Planning.* Environments, Volume 31, Issue 2, 2003, pp. 21-38.

Day, M. (1999). *Engendering an Environmental Ethic for Reducing Resource Consumption*. A thesis submitted in partial fulfillment of the degree of Master of Resource and Regional Planning, Otago University, Dunedin, New Zealand.

de Bruin, A. B. H. & van Gog, T. (2012). *Improving Self-monitoring and Self-regulation: From Cognitive Psychology to the Classroom.* Learning and Instruction, Volume 22, Issue 4, pp. 245-252.

Deen (Samarai), M. Y. I. (1990). *Islamic Environmental Ethics, Law and Society.* In Armstrong, S. J. & Botzler, R. G. (1993), *Environmental Ethics: Divergence and Confluence,* New York: McGraw-Hill, Inc., pp. 527-533.

Deganhardt, M. A. B. (1982). *Education and the Value of Knowledge.* London: George Allen and Unwin.

Delay, R. (1996). *Forming Knowledge: Constructivist Learning and Experiential Learning*. Journal of Experiential Learning, Volume 19, Issue 2, August/September, pp. 76-81.

Delors, J. (1996). *Learning: The Treasure Within.* Paris: UNESCO.

Department of Conservation (1993). *Greenprint Overview: The State of Conservation in New Zealand.* Wellington: Department of Conservation.

Department of Conservation (1994). *New Zealand's Biodiversity: An Overview.* Wellington: Department of Conservation.

Department of Corrections (2007). *Over-Representation of Māori in the Criminal Justice System: An Exploratory Report.* Policy, Strategy and Research Group, Department of Corrections, New Zealand.

DeRose, K. (2005). *What is Epistemology? A Brief Introduction to the Topic.* Retrieved on 27 May 2014 from http://s3.amazonaws.com/engrade-myfiles/4018068220916545/What_Is_Epistemology.pdf

Desjean-Perrotta, B., Moseky, C. & Cantu, L. E. (2008). *Preservice Teachers' Perceptions of the Environment: Does Ethnicity or Dominant Residential Experience Matter?* Journal of Environmental Education, Volume 39, Issue 2, pp. 21-31.

de Silva, L. (1987). *The Buddhist Attitude Towards Nature.* In Armstrong, S. J. & Botzler, R. G. (1993), *Environmental Ethics: Divergence and Confluence,* New York: McGraw-Hill, Inc., pp. 534-538.

Di Chiro, G. (1987). *Environmental Education and the Question of Gender: A Feminsit Critique.* In Robottom, I. (Ed.) (1987). *Environmental Education: Practice and Possibility.* Deakin University, Victoria, Australia, pp. 23-48.

Diamond, J. (2003). *Why Societies Collapse.* Presentation, TED2003, Filmed February 2003, Monterey, California, United States of America, posted October, 2008. Retrieved on 5 June 2012 from http://www.ted.com/talks/jared_diamond_on_why_societies_collapse.html

Digges, C. (2011). *Small-scale US Nuclear Reactor blamed for Spiking Cancer Rates, Casting Pall over Russia's FNPP Fetish.* Retrieved on 18 June 2012 from http://www.bellona.org/articles/articles_2011/McMurdo_leaks

Disinger, J. F. (1983). *Environmental Education's Definitional Problem.* Information Bulletin Number 2, ERIC Clearinghouse for Science, Mathematics and Environmental Education. Columbus: Ohio State University.

Disinger, J. F. (1989). *The Current Status of Environmental Education in U.S. School Curricula.* Contemporary Education, Volume 60, Issue 3, pp. 126-136.

Disinger, J. F. (1990). *Environmental Education for Sustainable Development?* The Journal of Environmental Education, Volume 21, Issue 4, pp. 3-6. Retrieved on 13 May 2012 from http://www.tandfonline.com/doi/abs/10.1080/00958964.1990.9941931

Disinger, J. F. & Roth, C. E. (2000). *Environmental Literacy.* Journal of Wildlife Rehabilitation, Volume 23, Issue 3, pp. 25-26.

Dobson, A. P., Bradshaw, A. D. & Baker, A. J. M. (1997). *Science.* Volume 277, Issue 5325, 25 July 1997, pp. 515-522.

Doherty, T. J. & Clayton, S. (2011). *The Psychological Impacts of Global Climate Change.* American Psychologist, Volume 66, Issue 4, pp. 265-276.

Dorst, J. (1970). *Before Nature Dies.* Translated by C. D. Sherman, Queensborough Community College of the City of New York. London: Collins.

Doucet, C. (1992). *Chapter 36, Canada and Agenda 21*. Project de Société. Retrieved on 17 July 2011 from http://www.iisd.org/worldsd/canada/projet/c36.htm

Dove, M. R. (2006). *Indigenous People and Environmental Politics.* Annual Review of Anthropology, Volume 35, 2006, pp. 191-208.

Dowie, M. (2009). *Conservation Refugees: The Hundred-Year Conflict between Global Conservation and Native Peoples.* Massachusetts Institute of Technology Press.

Dowling, R. K. (1977). *Environmental Education: Recent Developments.* New Zealand Environment, 18, Spring, pp. 21-24.

Dowling, R. K. (1978). *Environmental Education - the Current State of Play.* Canterbury Environment Journal, 3(10), November, pp. 6-7.

Dowling, R. K. (1979). *An Introduction to Environmental Education.* In R. K. Dowling (Ed.), *Environmental Education Handbook for New Zealand Secondary Schools*, pp. 6-14. Christchurch: Canterbury Environment Centre.

Dowling, R. K. (1986). *Education for the Environment.* New Zealand Environment, 49, Autumn, pp. 14-17.

Dowling, R. K. (1993). *Environmental Education in New Zealand.* Australian Journal of Environmental Education, Volume 9, pp. 21-32.

Driessen, J. O. (2005). *Trends in Boys' Education in New Zealand*. MEdAdmin (Massey University) Education Answers 2005, pp. 1-8. Retrieved on 11 July 2010 from http://www.nzcpr.com/Education.pdf

Dufault, Y. G. (2003). *A Quest for Character: Explaining the Relationship between First Nations Teachings and "Character Education".* A thesis submitted in conformity with the requirements for the degree of Master of Arts, Department of Curriculum, Teaching and Learning, Ontario Institute for Studies in Education of the University of Toronto.

Duffy, T. M. & Jonassen, D. H. (Eds.) (1992). *Constructivism and the Technology of Instruction: A Conversation.* New Jersey: Lawrence Erlbaum Associates.

Dunlap, R. E. (2008). *The New Environmental Paradigm Scale: From Marginality to Worldwide Use.* The Journal of Environmental Education, Volume 40, Number 1, pp. 3-18.

Dunlap, R. E. (2013). *Climate Change Skepticism and Denial: An Introduction.* American Behavioural Scientist, Volume 57, Issue 6, pp. 691-698. Retrieved on 28 September 2013 from http://abs.sagepub.com/content/57/6/691.full.pdf+html

Dunlap, R. E. & Van Liere, K. D. (1978). *The New Environmental Paradigm: a Proposed Measuring Instrument and Preliminary Results.* Journal of Environmental Education, Volume 9, pp. 10-19.

Durie, M. (1998a). Te Mana, Te Kawanatanga: The Politics of Māori Self-Determination. Oxford, Auckland, New Zealand.

Durie, M. (1998b). Whaiora: Māori Health Development (2nd Edition). Oxford University Press.

Durie, M. (1999). *Te Pae Mahutonga: A Model for Māori Health Promotion*. Health Promotion Forum of New Zealand Newsletter 49, 2-5 December, 1999. New Zealand.

Durie, M. (2001). *A Framework for Māori Educational Achievement.* A paper delivered at the *Hui Taumata Mātauranga,* Turangi and Taupo, hosted by Tumu Te Heuheu, 23-25 February 2001. Retrieved on 11 August 2011 from http://www.minedu.govt.nz/NZEducation/EducationPolicies/MāoriEducation/AboutMāoriEducation/WhoWeAre/EngagementWithMāori/HuiTaumataMatauranga/AFrameworkForConsideringMāoriEducationalAdvancement.aspx

Durie, M. (2004). *Māori Achievement: Anticipating the Learning Environment.* Hui Taumata Mātauranga IV, 5 September, 2004, Turangi/Taupo. Retrieved on 17 July 2011 from http://www-404.massey.ac.nz/massey/fms/Te%20Mata%20O%20Te%20Tau/Publications%20-%20Mason/Māori%20Achievement%20Anticipating%20the%20learnong%20environment.pdf

Durie, M. (2010). *Outstanding Universal Value: How Relevant is Indigeneity?* In Selby, R., Moore, P. & Mulholland, M. (Eds.) *Māori and the Environment: Kaitiaki*, pp. 239-350. Wellington, New Zealand: Huia.

Dwernychuk, L. W., Hoang Dunh Cau, C. T. Hatfield, T. G. Boivin, Tran Manh Hung, Phung Tri Dung, Nguyen Dinh Thai (2002). *Dioxin Reservoirs in Southern Viet Nam – A Legacy of Agent Orange.* Chemosphere, Volume 47, Issue 2, pp. 117-137. Retrieved on 18 November 2013 from http://www.sciencedirect.com/science/article/pii/S0045653501003009#

Dwyer, J. H. & Flesch-Janys, D. (1995). *Editorial: Agent Orange in Vietnam*. American Journal of Public Health, Volume 85, Number 4, pp. 476-478. Retrieved on 18 November 2013 from http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1615113/

Dziuban, J. & Kysilka, M. (1996). *What is Really Important in the Curriculum World?* In Slater Stern, B. & Kysilka, M. L. (Eds.) (2008), *Contemporary Readings in Curriculum.* Thousand Oaks, California: Sage Publications, Inc..

Eames, C. & Barker, M. (2011). *Understanding Student Learning in Environmental Education in Aotearoa New Zealand.* The Free Library. Retrieved April 07, 2012 from http://www.thefreelibrary.com/Understanding student learning in environmental education in Aotearoa...-a0268403838

Eames, C., Barker, M., Wilson-Hill, F., & Law, B. (2009a). *A Framework for Developing Action Competence in Education for Sustainability (EfS).* Summary. Wellington: Teaching Learning Research Initiative. Retrieved on 16 October 2013 from http://www.tlri.org.nz/sites/default/files/projects/9245_summaryreport.pdf

Eames, C., Barker, M., Wilson-Hill, F., & Law, B. (2009b). *A Framework for Whole-school Approaches to Education for Sustainability (EfS): Facilitator Guide.* Wellington: Teaching and Learning Research Initiative. Retrieved on 16 October 2013 from http://www.tlri.org.nz/sites/default/files/projects/9245_Appendix%20C.pdf

Eames, C., Barker, M., Wilson-Hill, F., & Law, B. (2009c). I*nvestigating the Relationship between Whole-school Approaches to Education for Sustainability and Student Learning. A Summary.* Wellington: Teaching and Learning Research Initiative. Retrieved on 16 October 2013 from http://www.tlri.org.nz/sites/default/files/projects/9245_summaryreport.pdf

Eames, C. & Chapman, D. (2008). *Consultation Report for the Revision of the 'Guidelines for Environmental Education in New Zealand Schools'.* Wellington, New Zealand: Ministry of Education.

Eames, C., Cowie, B. & Bolstad, R. (2008). *An Evaluation of Characteristics of Environmental Education Practice in New Zealand Schools.* Environmental Education Research, Volume 14, Number 1, pp. 35-51.

Eames, C., Law, B., Barker, M., Iles, H., McKenzie, J., Williams, P., Wilson-Hill, F. Patterson, R., Rolleston, N., Carroll, C., Chaytor, M., Mills, T. & Wright, A. (2011). *Teaching for Action in the Environment: Some Research Outcomes.* Publications, New Zealand Association for Environmental Education. Retrieved on 14 October 2012 from http://www.nzaee.org.nz/index.asp?pageID=2145880096

Eames, C., Roberts, J., Cooper, G. & Hipkins, R. (2010). *Education for Sustainability in New Zealand Schools: An Evaluation of Three Professional Development Programmes Summary Report.* Wellington: Ministry of Education.

Earl, R. (1991). *Shorelines and Estuaries: Turning the Tide.* In Porritt, J. (1991) *Save the Earth.* London: Dorling Kindersley Limited.

Earth Charter International-UNESCO-UN DESD (2007). *Good Practices Using the Earth Charter.* Education for Sustainable Development in Action, Good Practices Number 3, UNESCO Education Sector, Paris.

Earth Council (1993). *Treaty on Environmental Education for Sustainable Societies and Global Responsibility.* Brazil: Non-Governmental Organisations (NGO's) International, June 1992.

Eccles, J. S., Barber, B. L., Stone, M. & Hunt, J. (2003). *Extracurricular Activities and Adolescent Development.* In Slater Stern, B. & Kysilka, M. L. (Eds.) (2008), *Contemporary Readings in Curriculum.* Thousand Oaks, California, USA: Sage Publications, Inc..

Edwards, B. (2004). *Sustainability and Education in the Built Environment.* In Blewitt, J. & Cullingford, C. (Eds.) (2004). *The Sustainability Curriculum: The Challenge for Higher Education.* Earthscan, London, UK, pp. 129-140.

Edwards, R. (2000). *Lifelong Learning, Lifelong Learning, Lifelong Learning: A Recurrent Education?* In Field, J. & Leicester, M. (Eds.) (2000). *Lifelong Learning: Education across the Lifespan,* London, United Kingdom: RoutledgeFalmer, pp. 3-11..

Edwards, S. (2010). *Mātauranga Māori Literacies: Indigenous Literacy as Epistemological Freedom v. Eurocentric Imperialism.* In *Indigenous Voices, Indigenous Research*, World Indigenous Nations Higher Education Consortium Journal, Deakin University Printery, pp. 26-37.

Egan, K. (2001). *Why Education is so Difficult and Contentious.* In Slater Stern, B. & Kysilka, M. L. (Eds.) (2008), *Contemporary Readings in Curriculum.* Thousand Oaks, California: Sage Publications, Inc..

Einstein, A. (1879-1955). Retrieved on 16 May 2012 from Einstein Quotes at www.einstein-quotes.com.

Eisner, E. W. (2003) *Questionable Assumptions about Schooling.* In Slater Stern, B. & Kysilka, M. L. (Eds.) (2008), *Contemporary Readings in Curriculum.* Thousand Oaks, California: Sage Publications, Inc., pp. 11-20.

Elver, H. (2012). *The Headscarf Controversy: Secularism and Freedom Religion.* New York: Oxford University Press.

Emeh, J. & Oden, S. N. (2005). *Articulating Environmental Education in a Research Institute: Conflicts, Institutional Requirements and Triumphs.* Journal of Environmental Systems, Volume 32, Issue 3, pp. 261-269.

Emel, J. (1994). *Environment Perception*. In The Johnston, R., Gregory, D. & Smith, D. (Eds.) Dictionary of Human Geography. Oxford Blackwell Publishers, pp. 166-167.

Encyclopaedia Britannica (2013). *Aral Sea.* Encyclopaedia Britannica Online Academic Edition. Encyclopaedia Britannica Incorporated. Retrieved on 19 February from http://www.britannica.com/EBchecked/topic/31983/Aral-Sea/284486/Environmental-consequences

Enviroschools Foundation (2004). *Learning for a Sustainable Future: Enviroschool.* Retrieved on 17 November, 2011 from http://www,enviroschools.org.nz 5.

Enviroschools Foundation (2007). *Enviroschools Scrapbook: Using the Action Learning Cycle.* Hamilton, New Zealand: Fusion Print Limited,.

Enviroschools (2008). *Enviroschools.* Retrieved from http://www,enviroschools.org.nz November 2011.

Enviroschools Foundation (2008). *Enviroschools Handbook.* Hamilton, New Zealand: Hamilton City Council.

Enviroschools Foundation (2010a). *Enviroschools History and Development.* Retrieved from on 12 November 2011 from http://www,enviroschools.org.nz 5.

Enviroschools Foundation (2010b). *Enviroschools Scrapbook: Pūmahara - Reflection.* Hamilton, New Zealand: Fusion Print Limited.

Enviroschools Foundation (2011). *Enviroschools Kit*. Hamilton, New Zealand: Fusion Print Limited.

Enviroschools (2013). *Enviroschools Programme*. Retrieved on 15 October, 2013 from http://www.enviroschools.org.nz/enviroschools-programme

Erdoğan, M., Coskun, E. & Usak, M. (2011). *Developing Children's Environmental Literacy through Literature: An Analysis of 100 basic Literacy Works.* Egitim Arastirmalari – Eurasian Journal of Educational Research, Volume 42, pp. 45-62.

Eubanks, P. & Schaeffer, D. (2008). *A Kind Word for Bullshit: The Problem of Academic Writing.* College Composition and Communication, Volume 59, Issue 3, pp. 372-388.

Evans, J. (2009). *Nga Waka o Nehera: The First Voyaging Canoes.* Auckland, New Zealand: Libro International.

Eyles, J. & Smith, D. M. (Eds.) (1988). *Qualitative Methods in Human Geography.* Reprinted by Polity Press in association with Blackwell Publishers, Bridge Street, Cambridge, United Kingdom.

Fagen, B. M. (2008). *The Great Warming: Climate Change and the Rise and Fall of Civilizations.* New York: Bloomsbury Press.

Fairburn, M. (1989). *The Ideal Society and its Enemies: The Foundations of Modern New Zealand Society 1850-1900,* Auckland: Auckland University Press, pp. 19-41.

Fairman, K., Barrett, Y., Bones, D., & Goodwin, J. (Eds.) (1995). *EE Reference Collection: Selected Articles on Environmental Education: Traditional Perspectives, New Ideas, Differences of Opinion.* Michigan: University of Michigan, School of Natural Resources an Environment.

Fassbinder, S. D., Nocella II, A. J., & Kahn, R. (Eds.) (2012). *Greening the Academy: Ecopedgogy Through the Liberal Arts.* Rotterdam, The Netherlands: Sense Publishers.

Fazey, I., Fazey, J. A., Fischer, J., Sherren, K., Warren, J., Noss, R. F. & Dovers, S. R. (2007). *Adaptive Capacity and Learning to Learn as Leverage for Social-Ecological Resilience.* Frontiers in Ecology and the Environment, Volume 5, pp. 375-380. Retrieved on 14 April 2012 from http://www.esajournals.org/doi/abs/10.1890/1540-9295%282007%295%5B375:ACALTL%5D2.0.CO;2

Feeney, C. (1991). *Environmental Education in the Auckland Regional Water Board's Resource Management Work*. In D. Springett & C. Michael Hall (Eds.) *Our Common Future: the Way Forward, The Proceedings of the New Zealand Natural heritage Foundation International Conference on Environmental Education, Palmerston North, New Zealand, 26-30 August, 1991.* New Zealand Natural Heritage Foundation, pp. 136-140..

Ferreira, J. A., Ryan, L. & Tilbury, D. (2006). *Wholeschool Approaches to Sustainability: A Review of Models for Professional Development in Pre-service teacher Education.* Australian Research Institute in Education for Sustainability (ARIES) for the Australian Government. Retrieved on 27 November 2013 from http://aries.mq.edu.au/projects/preservice/files/TeacherEduDec06.pdf

Ferreira, J. A., Ryan, L. & Tilbury, D. (2007). *Mainstreaming Education for Sustainable Development in Initial teacher Education in Australia: A Review of Existing Professional Development Models.* Journal of Education for Teaching: International Research and Pedagogy, Volume 33, pp. 225-239.

Field, J. & Leicester, M. (Eds.) (2000). *Lifelong Learning: Education across the Lifespan.* Routledge Falmer, 11 New Fetter Lane, London, United Kingdom.

Fien, J. (1993a). *Education for the Environment: Critical Curriculum Theorising and Environmental Education.* Geelong: Deakin University Press.

Fien, J. (Ed.) (1993b). *Environmental Education: A Pathway to Sustainability*. Geelong: Deakin University Press.

Fien, J. (2001). *Educating for a Sustainable Future.* In Campbell, J. (Ed.) (2001), *Creating Our Common Future: Educating for Unity in Diversity.* Published jointly by the United Nations Educational, Scientific and Cultural Organization, and Berghahn Books, United States of America, pp. 122-142.

Fien, J. & A. Greenall Gough (1996). *Environmental Education* in Gilbert, R. (Ed.) *Studying Society and Environment: A Handbook for Teachers*. South Yarra: MacMillan Education Australia.

Fien, J., D. Heck, and J. Fereira (1996). *Learning for a Sustainable Environment: A Professional Development Guide for Teachers*. Brisbane: UNESCO Principal Regional Office for Asia and the Pacific, Bangkok and Griffith University.

Fien, J. Yencken, D. & Sykes, H. (Eds.) (2002). *Young People and the Environment: An Asia-Pacific Perspective.* Dordrecht, The Netherlands: Kluwer Academic Publishers.

Finnis, K. (2004). *Creating a Resilient New Zealand: Can Public Education and Community Development Campaigns Create Prepared Communities? An Examination of Preparedness Motivation Strategies.* Ministry of Civil Defence and Emergency Management. Retrieved on 1 November 2013 from http://www.civildefence.govt.nz/memwebsite.nsf/Files/finnis_report_final/$file/finnis_report_final.pdf

Fish, S. (2008). *Save the World on Your Own Time.* New York: Oxford University Press, Inc.

Fitz, J., Davies, B. & Evans, J. (2006). *Educational Policy and Social Reproduction: Class Inscripton and Symbolic Control.* Abingdon, Oxon: Routledge.

Flannery, T. (1994). *The Future Eaters.* Sydney: Reed Books.

Flannery, T. (2005). *The Weather Makers: The History and Future Impact of Climate Change.* Melbourne, Australia: The Text Publishing Company.

Fleisher, S. (2011). *Emerging Beliefs Frustrate Ecological Literacy and Meaning-making for Students.* Cultural Studies of Science Education, Volume 6, Issue 1, March 2011, pp. 235-241.

Fleming, N. D. & Mills, C. (1992). *Not Another Inventory, Rather a Catalyst for Reflection.* To Improve the Academy, Volume. 11, p. 137.

Foley, J. (2010). *The Other Inconvenient Truth.* Presentation, TEDxTC, Filmed October 2010, St. Paul, Minnesota, United States of America, Posted April 2012. Retrieved on 17 June 2012 from http://www.ted.com/talks/jonathan_foley_the_other_inconvenient_truth.html

Folke, C., Hahn, T., Olsson, P. & Norberg, J. (2005). *Adaptive Governance of Social-Ecological Systems.* Annual Review of Environment and Resources, Volume 30, 2005, pp. 441-473. Sweden.

Folke, C. (2006). *Resilience: The emergence of a Perspective for Social-ecological Systems Analyses.* Global Environmental Change, Volume 16, pp. 253-267.

Foreman, D. (1991). *Putting the Earth First.* In Armstrong, S. J. & Botzler, R. G. (1993), *Environmental Ethics: Divergence and Confluence*, pp. 422-429. New York: McGraw-Hill Inc..

Foster, P. (1990). *Policy and Practice in Multicultural and Anti-racist Education.* London, United Kingdom: Routledge, 11 New Fetter Lane.

Foster, J. (2001). *Education as Sustainability*. Environmental Education Research, Volume 7, Issue 2, pp. 153-165.

Fowler, F. G. & Fowler, H. W. (Eds.) (1996). *The Pocket Oxford Dictionary of Current English*. Oxford, United Kingdom: Clarendon Press.

Frame, R., Taylor, R. E., Delaney, K. & Brignall-Theyer, M. (2007). *International Scenario Comparisons.* From *Four Futures for New Zealand: Work in Progress.* Landcare Research, New Zealand. Retrieved on 7 June 2009 from http://www.landcareresearch.co.nz/services/sustainablesoc/futures/publications.asp)

Fraser Darling, F. (1969). *Man's Responsibility for the Environment.* In Armstrong, S. J. & Botzler, R. G. (1993), *Environmental Ethics: Divergence and Confluence*, pp. 298-391. New York: McGraw-Hill Inc..

Freeman, C. (2004). *Sustainable Development from Rhetoric to Practice? A New Zealand Perspective*. International Planning Studies, Volume 9, Number 4, pp. 307-326.

Frydenberg, E. (2004). *Coping Competencies: What to Teach and When.* Theory into Practice, Volume 43, Issue 1, pp. 14-22.

Gais, S., Lucas, B. & Born, J. (2006). *Sleep After Learning Aids Memory Recall.* Learning Memory, Volume 13, pp. 259-262. Spring Harbor Laboratory Press. Retrieved on 17 March 2012 from http://learnmem.cshlp.org/content/13/3/259.short

Galang, A. P., (2010). *Environmental Education for Sustainability in Higher Education Institutions in the Philippines.* International Journal of Sustainability in Higher Education, Volume 11, Issue 2, 2010, pp. 173-183.

Galbreath, R. (1993). *Working for Wildlife: A History of the New Zealand Wildlife Service.* Wellington: Bridget Books Limited in association with the Historical Branch, Department of Internal Affairs.

Gallagher, T. (2008). *Tikanga Māori Pre-1840.* Te Kāhui Kura Māori, Volume 0, Issue 1. Electronic version, Retrieved on 21 March 2011 from New Zealand Electronic Text Centre http://www.nzetc.org/tm/scholarly/tei-Bid001Kahu-t1-g1-t1.html

Gamble, W. (1998). *We Get it Right Most of the Time Say Weather Prophets.* New Zealand Herald, Saturday December 26, 1998. Retrieved on 1 April 2012 from http://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=651

Garner, R. (2004). *Politics and Sustainable Development.* In Blewitt, J. & Cullingford, C. (Eds.) (2004). *The Sustainability Curriculum: The Challenge for Higher Education.* London: Earthscan, pp. 208-217.

Gasbarri, A., Pompili, A., Arnone, B., d'Onofro, A., Marchetti, A., Tavares, M.C. & Tomaz, C. (2005). *Declarative Memory Retention and Emotional Stimuli. A Study of and Italian Sample.* Functional Neurology, Volume 20, Issue 4, October 2005, pp. 157-162.

Gibbs, M. (2006). *Justice as Reconciliation and Restoring Mana in New Zealand's Treaty of Waitangi Settlement Process.* Political Science, Volume 58, Number 2, December 2006, pp.15-27.

Gibbs-Smith, E. (2010). *Kai and Wai: From a Mātauranga Māori Perspective.* Whai korero na Emma Gibbs-Smith mo te Kahui. An unpublished paper delivered to the National Iwi Network hui, te Papa, Wellington, 2010. Retrieved on 23 August 2011 from http://www.epa.govt.nz/Publications/2011%20ENV%20-%20Presentation%20S14%20Emma%20Gibbs%20Smith%20-%20Wai%20and%20Kai.pdf

Gilding, P. (2012). *The Earth is Full.* Presentation, TED2012, Filmed February 2012, Longbeach, California, United States of America, posted February 2012. Retrieved on 17 July 2011 from http://www.ted.com/talks/paul_gilding_the_earth_is_full.html?utm_source=feedburner&utm_medium=feed&utm_campaign=Feed%3A+TEDTalks_video+%28TEDTalks+Main+%28SD%29+-+Site%29

Gillies, W. & Hall, R. (1903). *Nature Studies in Australia: With a Natural History Calendar, Summaries of the Chapters, and Complete Index.* Melbourne, Australia: Whitcombe & Tombs.

Gilman, R. (1983). *Rediscovering the American Vision: Roots and Renewal.* In Context, Number 3, Summer, 1983.

Gioda, A. & Baker, M. (2003). Water, Civilizations and Governance. In Rodda, J.C., Ubertini, L., (2004) *The Basis of Civilization - Water Science?* IAHS International Commission on Water Resources Systems, Consiglio nazionale delle ricerche (Italy), Symposium on the Basis of Civilization--Water Science?

Giuliano, J. A. (2001). *Healing Our World.* Fishpond: Amazon.com.

Glaser, B. G. & Strauss, A. L. (1967). *The Discovery of Grounded Theory: Strategies for Qualitative Research.* Aldine, New York : Aldine Publishing Co..

Glaser, B. G. (1978). *Theoretical Sensitivity: Advances in the Methodology of Grounded Theory.* Mill Valley, CA: Sociology Press.

Glorieux, I., Laurijssen, I., Minnen, J. & van Tienoven, T. P. (2010). *In Search of the Harried Leisure Class in Contemporary Society: Time-use Surveys and Patterns of Leisure Time Consumption.* Journal of Consumer policy, Volume 33, Issue 2, pp. 163-181.

Gloster, M. (2000). *Approaching Action Research from a Socioecological Perspective.* Systemic Practice and Action Research, Volume 13, Number 5, pp. 665-682.

Gluckman, P. D. (2010). *Integrity in Science: Implications From and For the Climate Change Debate.* Speech: Prime Ministers Science Advisory Committee, Victoria University, Wellington. Retrieved on 25 August 2011 from http://www.scoop.co.nz/stories/SC1006/S00021.htm

Golden, K. J. (2008). *Drifting Away from Nature: The Cost of Convenience.* Paper delivered at the Forum on Public Policy, USA, 2008. Retrieved on 6 August 2012 from http://forumonpublicpolicy.com/archivespring08/golden.pdf

Goldman, D., Yavetz, B. & Pe'er, S. (2006). *Environmental Literacy in Teacher Training in Israel: Environmental Behaviour of New Students.* Journal of Environmental Education, Volume 38, Issue 1, pp. 3-22.

Goldwater, M. (2008). *At the Coal Face.* Retrieved on 9 August 2011 from http://www.mindfood.com/at-mag-at-the-coalface-china-coal-environment-energy.seo

González-Gaudiano, E. J. (2008). *Environmental Education: A Field in Tension or Transition?* In Reid, A. & Scott, W. (Eds.) (2008). *Researching Education and the Environment: Retrospect and Prospect.* Oxon: Routledge, pp. 45-54.

Goralnik, L. & Nelson, M. P. (2011). *Framing a Philosophy of Environmental Action: Aldo Leopold, John Muir, and the Importance of Community.* Journal of Environmental Education, Volume 42, Issue 3, pp. 181-192.

Gordon, J. (1978). *Structures: Or Why Things Don't Fall Down.* Auckland: Penguin Books.

Gore, A. (1992). *Earth in the Balance: Forging a New Common Purpose.* London, Great Britain: Earthscan Publications Ltd..

Gore, A. (2006). *An Inconvenient Truth: A Global Warning*. [videorecording] / [presented by] Paramount Classics and Participant Productions ; a Lawrence Bender/Laurie David production ; a Carbon Neutral production ; directed by Davis Guggenheim ; produced by Laurie David, Lawrence Bender, Scott Z. Burns ; executive producers, Jeff Skoll ... [et al.] ; co-producer, Leslie Chilcott. Paramount, Hollywood, California.

Gore, A. (2006). *An Inconvenient Truth: The Planetary Emergency of Global Warming and What We Can Do About It*. Emmaus, Pa.: Rodale Press.

Gore, A. (2007). *An Inconvenient Truth: The Crisis of Global Warming.* Adapted for young readers by Jane O'Connor. London: Bloomsbury.

Gorman, P. (2010). *MetService Spend up to Improve Accuracy*. Retrieved on 5 November 2011 from http://www.stuff.co.nz/national/3959661/MetService-spendup-to-improve-accuracy

Gosling, D. (1990). *Religion and the Environment*. In Angell D.J.R, Comer J.D. & Wilkinson M.L.N. (Eds.) (1990), *Sustaining Earth: Response to the Environmental Threat.* Macmillan Academic and Professional Ltd., London.

Gotts, N. M. (2007). *Resilience, Panarchy, and World-Systems Analysis.* Ecology and Society, Volume 12, Issue 1, Article 24, retrieved on 23 October 2012 from http://www.ecologyandsociety.org/vol12/iss1/art24

Gough, A. G. (1993). *Globalizing Environmental Education: What's Language Got To Do With It?* Journal of Experiential Education, Volume 16, Issue 3, December, pp. 32-39.

Gough, A. (2005). *Sustainable Schools: Renovating Educational Processes.* Applied Environmental Education and Communication, Volume 4, pp. 339-351.

Gough, A. (2006). *A Long, Winding (and Rocky) Road to Environmental Education for Sustainability in 2006*. Australian Journal of Environmental Education, Volume 22, pp. 71-76.

Gough, N. (1987). *Learning Within Environments: Towards an Ecological Paradigm for Education.* Robottom, I. (Ed.) (1987). *Environmental Education: Practice and Possibility.* Victoria, Australia: Deakin University, pp. 49-67.

Gough, N. (1990). *Healing the Earth Within Us: Environmental Education as Cultural Criticism.* The Journal of Environmental Education, Volume 13, Issue 3, pp. 12-17.

Gough, N. (2002). *Ignorance in Environmental Education Research.* Australian Journal of Environmental Education, Volume 18, pp. 19-26.

Gough, S. (2008). *Locating the Environmental in Environmental Education Research: What Research – and Why?* In Reid, A. & Scott, W. (Eds.) (2008). *Researching Education and the Environment: Retrospect and Prospect.* Oxon: Routledge, pp. 89-98.

Gould, S. J. (1990). *The Golden Rule - A Proper Scale for Our Environmental Crisis.* In Armstrong, S. J. & Botzler, R. G. (1993), *Environmental Ethics: Divergence and Confluence*, pp. 310-316. New York: McGraw-Hill, Inc..

Grace, J. T. H. (1959). *Tuwharetoa: A History of the Māori People of the Taupo District.* Reprinted 2002. Reed Publishing, New Zealand Limited.

Graham, P. (2000). *Building Education for the Next Industrial Revolution: Teaching and Learning Environmental Literacy for the Building Professions.* Construction Management and Economics, Volume 18, Issue 8, pp. 917-925.

Gray, M. (1990). *Nga Taonga Tapu Māori o tea o Kohatu: Prized Treasures From the Traditional World of Māori.* Lincoln University, Centre for Māori Studies and Research.

Green, K. C. (2008). *Global Climate Change: Evidence on Cause and Effects.* A report prepared for the Morgan Family Charitable Foundation. Retrieved on 11 January 2010 from http://polesapart.com/files/kcg_final.pdf

Greenall, A. E. (1980). Cited in G. Scott (1986), *School Based Environmental Education in New Zealand: Conceptual Issues and Political Implications, Volume One: Text.* Thesis, Ph.D., University of Canterbury, Christchurch, New Zealand, p. 2.

Greenall, A. E. (1987). *A Political History of Environmental Education in Australia: Snakes and Ladders.* In Robottom, I. (Ed.) (1987), *Environmental Education: Practice and Possibility.* Victoria, Australia: Deakin University, pp. 3-21.

Greenall Gough, A. (1993). *Founders in Environmental Education*. Victoria, Australia: Deakin University, Australia.

Greenpeace (2010). *Revealed True Cost of Coal in China*. Retrieved on 8 May 2011 from www.greenpeace.org/

Gregory, M. (2002). *The Politics of Difference vs the Ethics of Essentializing: Looking Back and Looking Forward in Humanities Discourse abut Human Nature.* Arts and Humanities in Higher Education, Volume 1, Number 1, pp. 125-144. Retrieved on 29 September 2013 from http://ahh.sagepub.com/content/1/2/125.short

Griffiths, T. & Robin, L. (Eds.) (1997). *Ecology and Empire: Environmental History of Settler Societies.* Edinburgh: Keele University Press.

Guha, R. (1989). *Radical American Environmentalism and Wilderness Preservation: A Third World Critique.* In Armstrong, S. J. & Botzler, R. G. (1993), *Environmental Ethics: Divergence and Confluence,* New York: McGraw-Hill, Inc., pp. 552-561.

Gunderson, T. (2011). http://aircrap.org/former-fbi-chief-ted-gunderson-says-chemtrail-death-dumps-must-be-stopped/33301/

Gunn, A. (1986). *What is an Environmental Ethic?* New Zealand Environment, Voume 49, Autumn, pp. 3-8.

Guofang Li, (2008). *Culturally Contested Literacies: America's "Rainbow Underclass" and Urban Schools.* New York: Routledge.

Guthrie, R. D. (1967). *The Ethical Relationship Between Humans and Other Organisms.* In Armstrong, S. J. & Botzler, R. G. (1993), *Environmental Ethics: Divergence and Confluence*, pp. 292-297. New York: McGraw-Hill.

Hall, R. & Bauer-Armstrong, C. (2010). *Earth Partnership for Schools: Ecological Restoration in Schools and Communities.* Ecological Restoration, Volume 28, Issue 2, pp. 208-212.

Hall, D. & Scurlock, J. (1991). *Grasslands: Defending the Open Range.* In Porritt, J. (1991) *Save the Earth.* London: Dorling Kindersley Limited.

Haigh, M. J. (2006). *Promoting Environmental Education for Sustainable Development: The Value of Links Between Higher Education and Non-Governmental Organizations (NGOs).* Journal of Geography in Higher Education, Volume 30, Issue 2, July 2006, pp. 327-349.

Haila, Y. (2012). *Genealogy of Nature Conservation: A Political Perspective.* Nature Conservation I, pp. 27-52. Retrieved on 4 August 2012 from DOI:10.3897/natureconservation.1.2107.

Hails, C. (1989). *The Importance of Biological Diversity*. Switzerland: World Wide Fund (WWF–International).

Haines, A. L. (1996). *The Yellowstone Story: A History of Our First National Park.* Wyoming and Niwot, Colorado, United States of America: Yellowstone Association for Natural Science, History and Education, Yellowstone National Park.

Hakopa, H. (2011). *The* Paepae: *Spatial Information Technologies and the Geography of Narratives.* A thesis submitted for the Degree of Doctor of Philosophy at the University of Otago, Dunedin, New Zealand.

Handel, W. (1982). *Ethnomethodology: How People Make Sense.* Englewood Cliffs: Prentice-Hall, Inc..

Hanbury-Tenison, R. (1991). *Tribal Peoples: Honouring Wisdom.* In Porritt, J. (1991) *Save the Earth.* London: Dorling Kindersley Limited.

Hardin, G. (1977). *The Limits of Altruism: An Ecologists View of Survival.* Bloomington: Indiana University Press.

Hardoy, J. & Satterthwaite, D. (1991). *Towns and Cities: Empowering People.* In Porritt, J. (1991) *Save the Earth.* London: Dorling Kindersley Limited.

Hares, M., Eskonheimo, A., Myllyntaus, T. & Luukkanen, O. (2006). *Environmental Literacy Interpreting Endangered Sustainability. Case Studies from Thailand and the Sudan.* Geoforum, Volume 37, Issue 1, pp. 128-144.

Hargrove, E. C. (1989). *An Ontological Argument for Environmental Ethics.* In Armstrong, S. J. & Botzler, R. G. (1993). *Environmental Ethics: Divergence and Confluence.* New York: McGraw-Hill, Inc., pp. 158-156.

Harich, J. (2010). *Change Resistance as the Crux of the Environmental Sustainability Problem.* System Dynamics Review, Volume 26, Number 1, pp. 35-72.

Harmsworth, G. (2002). *Indigenous Concepts, Values and Knowledge for Sustainable Development: New Zealand Case Studies.* Paper presented at the 7th Joint Conference: *Preservation of Ancient Cultures and the Globalization Scenario*. School of Māori and Pacific Development & International Centre for Cultural Studies (ICCS), India, 22-24 November 2002. Te Whare Wānanga o Waikato, Hamilton, New Zealand.

Harnett, A. & Naish, M. (1990). *Schooling in Society.* In Entwistle, N. (Ed.) *Handbook of Educational Ideas and Practice.* London: Routledge.

Harraway, J., Broughton-Ansin, F., Deaker, L., Jowett, T. & Shephard, K. (2012). *Exploring the Use of the Revised New Ecological Paradigm Scale (NEP) to Monitor the Development of Students' Ecological Worldviews.* The Journal of Environmental Education, Volume 43, Issue 3, pp. 177-191.

Harris, R. & Smith, M. E. (2011). *The History in Urban Studies: A Comment.* Journal of Urban Affairs, Volume 33, Issue 1, February 2011, pp. 99-105.

Hart, E. (1981). *Identification of Key Characteristics of Environmental Education.* The Journal of Environmental Education, Volume 13, Issue 1, pp. 12-16.

Hart, M. A. (2010). *Indigenous Worldviews, Knowledge, and Research: The Development of and Indigenous Research Paradigm.* Journal of Indigenous Voices in Social Work, Volume 1, Issue 1, pp. 1-16. Retrieved on 28 June 2012 from http://scholarspace.manoa.hawaii.edu/bitstream/handle/10125/15117/v1i1_04hart.pdf

Hart, M. H. (1978). *The Evolution of the Atmosphere of the Earth.* Icarus, Volume 33, Issue 1, January 1978, pp. 23-39.

Hart, P. (2003). *Teachers' Thinking in Environmental Education: Consciousness and Responsibility.* New York: Peter Lang Publishing.

Hart, P. (2007). *Desires and Resistances as Drivers and Barriers to Environmental Learning and Sustainability: A Canadian Perspective*. In Björneloo, I. & Nyberg, E. (Eds.) (2007) *Drivers and Barriers for Implementing Learning for Sustainable Development in Pre-school through Upper Secondary and Teacher Education.* Paris: UNESCO, pp. 31-35.

Hart, P. & Nolan, K. (1999). *A Critical Analysis of Research in Environmental Education.* Studies in Science Education, Volume 34, pp. 523-531.

Hart, R., Daiute, C. Kritt, D. Rome, M., Sabo, K. & Iltus, S. (1996). *Child and Youth Development Through Community Participation: A Review of Psychological Literature on the Benefits of Community Participation and Children's Developing Capacities to Participate.* Berkley, California: The Children and Environment Group and the Children's Research Group.

Hart, R. A., Espinosa, M. F., Iltus, S. & Lorenzo, R. (1997). *Children's Participation: The Theory and Practice of Involving Young Citizens in Community Development and Environmental Care.* London: Earthscan Publications Limited.

Harvey, G. D. (1976). Cited in J. F. Disinger (1983), *Environmental Education's Definitional Problem.* Information Bulletin Number 2 ERIC Clearinghouse for Science, Mathematics and Environmental Education, pp. 4-7. Columbus: Ohio State University.

Harvey, G. D. (1977). *A Conceptualization of Environmental Education.* In J. L. Aldrich, A. M. Blackburn, & G. A. Abel (Eds.) *A Report on the North American Regional Seminar on Environmental Education*, pp. 66-72. Columbus: Ohio State University.

Hashimoto-Martell, E. A., McNeill, K. L. & Hoffman, E. M. (2011). *Connecting Urban Youth with their Environment: The Impact of an Urban Ecology Course on Student Content Knowledge, Environmental Attitudes and Responsible Behaviours.* Research in Science Education, pp. 1-20.

Hausmann, R., D'Andrea, L. & Zahidi, S. (2008). *The Global Gender Gap Report 2008.* Geneva, Switzerland: World Economic Forum.

Hawke, Y. & Morrison, A. (1994). *He Korowai: A Study Guide for Māori Tertiary Students.* New Zealand: Te Tari Awhina, UNITEC Institute of Technology, Te Kura Puukenga o Wairaka.

Hawthorne, M. & Alabaster, T. (1999). *Citizen 2000: Development of a Model of Environmental Citizenship.* Global Environmental Change, Volume 9, Issue 1, pp. 25-43.

Healy, J. (1999). *Endangered Minds: Why Children Don't Think and What We Can Do About It.* Revised Edition. New York: Touchstone.

Heckler, S. (Ed.) (2009). *Landscape, Process and Power: Re-evaluating Traditional Environmental Knowledge.* New York: Berghahn Books.

Heimlich, J. & Ardoin, N. (2008). *Understanding Behaviour to Understand Behaviour Change: A Literature Review.* Environmental Education Research, Volume 14, Number 3, June 2008, pp. 215-237.

Henderson, K. & Tilbury, D. (2004). *Whole School Approaches to Sustainability: An International Review of Whole-school Sustainability Programs.* Australian Research Institute in Education for Sustainability (ARIES) for the Department of the Environment and Heritage, Australian Government.

Henry, C. & Olsen, E. (2009). *School Innovation in Environmental Literacy.* BioCycle, Volume 50, Issue 4, pp. 31-32.

Herrick, W. (1997). *A Year On Ice: Living and Working in Antarctica.* Christchurch, New Zealand: Shoal Bay Press Limited.

Hicks, D. (1994). *Preparing for the Future: Notes and Queries for Conventional Educators.* WWF-UK: Adamantine Press.

Hill, B. V. (2001). *Educating for Moral Responsibility.* In Campbell, J. (Ed.) (2001), *Creating Our Common Future: Educating for Unity in Diversity.* Published jointly by the United Nations Educational, Scientific and Cultural Organization, and Berghahn Books, United States of America, pp.61-78.

Hirini, P. (1997). *He Whakaaro mo te Aria Whānaungatanga: He Ata Rapu: Towards an Understanding of Whanaungatanga.* He Pukenga Kōrero: A Journal of Māori Studies, Volume 2, Number 2, p. 44.

Hodgkinson, H. (2007). *Educational Demographics: What Teachers Should Know.* In Ornstein, A. C., Pajak, E. F. & Ornstein, S. B. (2007). *Contemporary Issues in Curriculum – Fourth Edition*, pp. 372-377. Pearson Education, Inc. USA.

Holdgate, M. (1990). *Changes in Perception* in Angell D.J.R, Comer J.D. & Wilkinson M.L.N. (Eds.) (1990), *Sustaining Earth: Response to the Environmental Threat.* London: Macmillan Academic and Professional Ltd..

Holling, C. S. (1973). *Resilience and Stability of Ecological Systems.* Annual Review of Ecology and Systematics, Volume 4, pp. 1-23.

Hook, G. R. (2007). *A Future for Māori Education Part II: The Reintegration of Culture and Education.* MAI Review, 2007, 1. Target Article. Retrieved on 2 February 2013 from http://www.review.mai.ac.nz

Howard, R. W., Berkowitz, M. W. & Schaeffer, E. F. (2004). *Politics of Character Education.* In Slater Stern, B. & Kysilka, M. L. (Eds.) (2008), *Contemporary Readings in Curriculum.* Thousand Oaks, California: Sage Publications, Inc..

Huckle, J. (1983). *Environmental Education*. In J. Huckle (Ed.) *Geographical Education: Reflection and Action.* Oxford: Oxford University Press.

Huckle, J. (1991). *Education for Sustainability: Assessing Pathways to the Future.* Australian Journal of Environmental Education, Volume 7, pp. 43-62.

Huckle, J. & Sterling, S. (Eds.)(1996). *Education for Sustainability.* London: Earthscan Publications Limited.

Huggett, R. J. (1997). *Catastrophism: Asteroids, Comets and Other Dynamic Events in Earth History*. London, UK: Verso.

Hughey, K. D. F., Rixecker, S. S., Montgomery, R. & Bührs, T. (Eds.) (1998). *New Zealand's State of the Environment Report: A Critical Response.* Canterbury, New Zealand: Environmental Management and Design Division, Lincoln University.

Hughey, K. F. D., Kerr, G. N., & Cullen, R. (2004). *Public Perceptions of New Zealand's Environment.* EOS Ecology. Canterbury New Zealand: Lincoln University.

Hull, R. B., Robertson, D. P., Richert, D. Seekamp, E. & Buhyoff, G. J. (2002). *Assumptions About Ecological Scale and Nature Knowing Best Hiding in Environmental Decisions.* Conservation Ecology, Volume 6, Issue 2.

Hungerford, H., Peyton, R. B. & Wilke, R. J. (1980). *Goals for Curriculum Development in Environmental Education.* The Journal of Environmental Education, Volume 11, Issue 3, pp. 42-47. Retrieved on 13 May, 2012 from http://www.tandfonline.com/doi/abs/10.1080/00958964.1980.9941381

Hungerford, H. & Volk, T. (1990). *Changing Learner Behaviour Through Environmental Education*. The Journal of Environmental Education, Volume 21, Issue 3, pp. 8-21.

Huntly, B. & Webb, T., III (1989). *Migration: Species' Responses to Climatic Variations Caused by Changes in the Earth's Orbit.* Journal of Biogeography, Volume 16, Number 1, pp. 5-19.

Inglehart, R. & Norris, P. (2003). *Rising Tide: Gender Equality and Cultural Change Around the World.* United Kingdom: Cambridge University Press.

Inglis, J. (1993). *Traditional Ecological Knowledge: Concepts and Cases*. Ottawa: International Program on Traditional Ecological Knowledge and International Development Centre.

Ingold, T. (1992). *Culture and the Perception of the Environment.* In Croll, E. & Parkin, D. (Eds.) Bush Base - Forest Farm. London: Routledge, pp. 39-56.

International Institute for Sustainable Development (IISD) (1997). *Sustainable Development Timeline.* Retrieved on 11 June 2010 from http://www.iisd.org/rio+5/timeline/sdtimeline.htm

Intergovernmental Panel on Climate Change (IPCC) (2007). *Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change.* IPCC, Geneva, Switzerland. Retrieved on 5 June 2013 from http://www.ipcc.ch/publications_and_data/publications_ipcc_fourth_assessment_report_synthesis_report.htm

Ip, P. K. (1986). *Taoism and the Foundations of Environmental Ethics.* In Armstrong, S. J. & Botzler, R. G. (1993), *Environmental Ethics: Divergence and Confluence,* New York: McGraw-Hill, Inc., pp. 539-544.

Irandoust, H. & Boury-Brisset, A. (2006). *The Pragmatics of Critiquing.* Defence Research & Development Canada – Valcartier, Technical Report.

IUCN (International Union for Conservation of Nature and Natural Resources) (1970). *International Working Meeting on Environmental Education in the School Curriculum, Final Report, September, IUCN USA*. Cited in J. Palmer and P. Neal, (1994), *The Handbook of Environmental Education*. London: Routledge.

International Union for Conservation of Nature and Natural Resources (IUCN) (1980). *World Conservation Strategy.* In collaboration with the Gland, Switzerland: United Nations Environment Program (UNEP). IUCN.

Isen, A.M. (1987). *Positive Affect, Cognitive Processes, and Social Behavior.* In Berkowitz, L. (Ed.) (1987) *Advances in Experimental Social Psychology.* Academic Press, Incorporated. Volume 20, pp. 203-253.

Jackson, S. & Martin, P. Y. (1998). *Surviving the Care System: Education and Resilience.* Journal of Adolescence, 1998, Volume 21, pp. 569-583.

Jackson, S. (2009). *Enviroschools in New Zealand.* MAI Review, 2009, Volume 1, intern Research Report 5. Retrieved on 15 June 2013 from http://www.review.mai.ac.nz/index.php/MR/article/viewFile/212/227

Jacob, M. (1994). *Sustainable Development and Deep Ecology: An Analysis of Competing Traditions.* Environmental Management, Volume 18, Issue 4, pp. 477-488.

Jacobs, P. & Mulvihill, P. (1995). *Ancient Lands: New Perspectives. Towards Multi-cultural Literacy in Landscape Management.* Landscape and Urban Planning, Volume 32, Issue 1, pp. 7-17.

James, B. (1993). *The Māori Relationship with the Environment.* Wellington, New Zealand: Department of Conservation.

Jarvis, P. (1995). *Adult & Continuing Education: Theory and Practice – Second Edition.* London: Routledge.

Jayaram, V. (2011). *Hinduism and Islam: A Comparison of Beliefs and Practices.* Retrieved on 15 June 2013 from www.hinduwebsite.com/hinduism/h_islam.asp

Jefferies, R. (1998). *Māori Participation in Tertiary Education: Barriers and Strategies to Overcome Them.* Wellington, New Zealand: Te Puni Kōkiri, the Ministry of Māori Development.

Jensen, A. R. (1973). *Educational Differences.* Edinburgh, Great Britain: T. & A. Constable Limited.

Jensen, B. B. & Schnack, K. (1997). *The Action Competence Approach in Environmental Education.* Environmental Education Research, Volume 3, Number 2, pp. 163-179.

Jickling, B. & Wals, A. E. J. (2008). *Globalization and Environmental Education: Looking Beyond Sustainable Development.* Journal of Curriculum Studies, Volume 40, Issue 1, pp. 1-21. Retrieved on 28 June, 2013 from http://www.tandfonline.com/doi/full/10.1080/00220270701684667#.UlyrWY4ijww.

Johansen, B. E. (2003). *Indigenous Peoples and Environmental Issues: An Encyclopedia.* Westport, Connecticut, United States of America: Greenwood Press.

Johnson, E. A. & Catley, K. M. (2009). *Urban Soil Ecology as a Focal Point For Environmental Education.* Urban Ecosystems, Volume 12, Issue 1, pp. 79-93.

Johnson, M. (Ed.) (1992). *Lore: Capturing Traditional Environmental Knowledge.* Hay River, NWT, CA: Dene Cultural Institute.

Jonassen, D. H. (1992). *Evaluating Constructivistic Learning.* In Duffy, T. M. & Jonassen, D. H. (Eds.) (1992). *Constructivism and the Technology of Instruction: A Conversation.* New Jersey: Lawrence Erlbaum Associates, pp. 137-148.

Jones, A. (2004). *Pedagogy of the Gaps: Lessons on Evidence from the Beach.* Jean Herbison Lecture, NZARE Annual Conference, Wellington, November, 2004.

Jones, A., Buntting, C., Hipkins, R., McKim, A. Conner, L. & Saunders, K. (2011). *Developing Students' Futures Thinking in Science Education.* Research in Science Education, 2011, pp. 1-22. Retrieved on 7 May 2012 from http://hdl.handle.net/10092/5261

Jordan, J. (2002). *Pascal's Wager: Pragmatic Arguments and Belief in God.* In Blackburn, S. (2002) Truth: A Guide. Oxford: Clarendon Press.

Jordan, R., Singer, F., Vaughan, J. & Berkowitz, A. (2009). *What Should Every Citizen Know About Ecology?* Frontiers in Ecology and the Environment, Volume 7, Issue 9, pp. 495-500.

Ka'ai, T., (2003a). *Te Mana o te Reo me ngā Tikanga: Power and Politics of the Language*. In Ka'ai, T., Moorfield, J.C., Reilly, M. & Mosely, S. (Eds), *Ki Te Whaiao: An Introduction to Māori Culture and Society.* Auckland, New Zealand: Pearson Education, pp. 201-213.

Ka'ai, T. (2003b). *Te ao Māori: The Māori World View*. In Ka'ai, T., Moorfield, J. C., Reilly, M. & Mosely, S. (Eds), *Ki Te Whaiao: An Introduction to Māori Culture and Society.* Auckland, New Zealand: Pearson Education.

Ka'ai, T., Moorfield, J. C., Reilly, M. & Mosely, S. (Eds) (2003). *Ki Te Whaiao: An Introduction to Māori Culture and Society.* Auckland, New Zealand: Pearson Education.

Kant, I. (1963). *Duties to Animals.* In Armstrong, S. J. & Botzler, R. G. (1993), *Environmental Ethics: Divergence and Confluence*, pp. 285-286. New York: McGraw-Hill, Inc..

Kaptchuk, T. J. & Eisenberg, D. M. (1998). *The Persuasive Appeal of Alternative Medicine.* Annals of Internal Medicine, Volume 129, Issue 12, 15 December 1998, pp. 1061-1065.

Kaufman, J. S., Ewing, M. S., Hyle, A. E., Montgomery, D. & Self, P. A. (2008). *Women and Nature: Using Memory-work to Rethink Our relationship to the Natural World.* In Reid, A. & Scott, W. (Eds.) (2008). *Researching Education and the Environment: Retrospect and Prospect.* Oxon: Routledge, pp. 63-82.

Kawagley, A. O. & Barnhardt, R. (1999). *Education Indigenous to Place: Western Science Meets Native Reality.* In Smith, G. A. & Williams, D. R. (1999), *Ecological Education in Action: on Weaving Education, Culture and the Environment*. New York: State University of New York Press, pp. 117-140.

Kawharu, M. (2001). *Local Māori Development and Government Policies.* Social Policy Journal of New Zealand, Issue 16, July 2001, pp. 1-16.

Keating, M. (1993). *The Earth Summit's Agenda for Change: A Plain Language Version of Agenda 21 and the Other Rio Agreements*. Geneva: Centre for Our Common Future.

Keating, I. & Moorcroft, R. (2006). *Managing the Business of Schools.* London: Sage Publications.

Keep, E. (1992). *Schools in the Market Place? Some Problems with Private Sector Models.* British Journal of Education and Work, Volume 5, Issue 2, pp. 43-56. Retrieved on 22 July 2010 from http://www.tandfonline.com/doi/abs/10.1080/0269000920050203

Keepes, B. & Maling, J. M. (2001). *A Weaving of Threads: The Warp and the Weft.* In Campbell, J. (Ed.) (2001), *Creating Our Common Future: Educating for Unity in Diversity.* Published jointly by the United Nations Educational, Scientific and Cultural Organization, and Berghahn Books, United States of America, pp. 143-162.

Kellow, G. (2011). *'Things Familiar to the Mind': Heuristic Style and Elliptical Citation in the Wealth of Nations.* History of Human Sciences, Volume 24, Issue 1, February 2011, pp. 1-18.

Kemp, B. (2009). *Nuclear Waste in Your Backyard?: Decision on Canadian Storage Facility Expected Within a Year*. Retrieved on 17 November 2011 from http://www.cbc.ca/news/canada/story/2009/08/19/f-nuclear-waste-storage-options.html.

Keown, P. (1996). *Values in the Curriculum Project: A Community of Inquiry Approach to Values Education Through Social Studies*. Hamilton: The University of Waikato.

Keown, P., Parker, L. & Tiakiwai, S. (2005). *Values in the New Zealand Curriculum: A Literature Review on Values in the Curriculum.* Literature Review on Values in the New Zealand Curriculum was completed under contract to the Ministry of Education, New Zealand by the Wilf Malcolm Institute of Educational Research, School of Education, The University of Waikato.

Kerr, R.A. (2003). *Extinction by a Whoosh, Not a Bang?* Science, Volume 302, Number 5649, p. 1315.

Ke Shen & Yi Zeng (2010). *The Association Between Resilience and Survival Among Chinese Elderly.* Demographic Research Author Manuscript. Retrieved on 15 August 2012 from http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2990503/

Kessler, R. (1999). *Nourishing Students in Secular Schools.* Educational Leadership, Volume 56, Number 4, pp. 49-52. Retrieved on 2 June 2012 from http://passageworks.org/wp-content/uploads/NourishingStudentsInSecularSchools.pdf

Key, J. (2011). In Harper, P. (2011), K*ey Rejects BBC Criticism of NZ 'Pure' Claim.* N.Z. Herald, Wednesday May 11, 2011. http://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=10724868

Key, J. (2012). In Hosking, R. (2012), *Prime Minister Defends Embattled John Banks.* The National Business Review, 1 May 2012. Retrieved 14 May 2012 from http://www.nbr.co.nz/article/prime-minister-defends-embattled-john-banks-rh-117765

Kidman, J. (2009). *Visual Methodologies: Exploring Indigenous Constructions of Self and Environment.* In Zandvliet, D. B. (Ed.) (2009), *Diversity in Environmental Education Research.* Rotterdam, The Netherlands: Sense Publishers, pp. 65-76.

Kiefer, J. & Kemple, M. (1999). *Stories from our Common Roots: Strategies for Building an Ecologically Sustainable Way of Learning.* In Smith, G. A. & Williams, D. R. (1999), *Ecological Education in Action: on Weaving Education, Culture and the Environment*. New York: State University of New York Press, pp. 21-45.

Kilbourne, W. E., Beckman, S. C. & Thelen, E. (2002). *The Role of the Dominant Social Paradigm in Environmental Attitudes: A Multinational Examination.* Journal of Business Research, Volume 55, Issue 3, March 2002, pp. 193-204.

Kilbourne, W. E. & Polonsky, M. J. (2005). *Environmental Attitudes and their Relation to the Dominant Social Paradigm Among University Students in New Zealand and Australia.* Australian Marketing Journal, Volume 13, Number 2, pp. 37-48.

Kimberly, J. R. & Bouchikhi, H. (1995). *The Dynamics of Organizational Development and Change: How the Past Shapes the Present and Constrains the Future.* Organization Science, Volume 6, Number 1, January-February 1995, pp. 9-18.

King, D. N. T., Skipper, A. & Tawhai, W. B. (2008). *Māori Environmental Knowledge of Local Weather and Climate Change in Aotearoa-New Zealand.* SpringerLink, Earth and Environmental Science, Climatic Change, Volume 990, Number 4, pp. 385-409. DOI: 10.1007/s10584-007-9372-y.

King, M. (2003). *The Penguin History of New Zealand.* Auckland, New Zealand: Penguin Books.

Kingdon, J. W. (1993). *Politicians, Self-Interests, and Ideas.* In Marcus, G.E. & Hanson, R.L. (Eds.) *Reconsidering The Democratic Public*. Pennsylvania State University, pp. 73-89.

Kinzig, A. P., Ehrlich, P. R., Alston, L. J., Arrow, K., Barrett, S., Buchman, T. G., Daily, G. C., Levin, B. Levin, S., Oppenheimer, M., Ostrom, E. & Saari, D. (2013). *Social Norms and Global Environmental Challenges: The Complex Interactions of Behaviours, Values, and Policy.* BioScience, Volume 63, Number 3 (March 2013), pp. 164-175. Retrieved on 9 September 2013 from http://www.jstor.org/stable/10.1525/bio.2013.63.3.5

Kipling, R. (1894). *The Jungle Book. http://www.goodreads.com/reader/655-the-jungle-book*

Klesges, R. C., Somes, G., Pascale, R. W., Klesges, L. M., Murphy, M., Brown, K. & Williams, E. (1988). *Knowledge and Beliefs Regarding the Consequences of Cigarette Smoking and their Relationships to Smoking in Biracial Sample.* Health Psychology, Volume 7, Issue 5, pp. 387-401. DOI: 10.1037/0278-6133.7.5.387

Klein, P. D. (2005). *Epistemology*. In Craig, E. (Ed.) Routledge Encyclopaedia of Philosophy. London: Routledge. Retrieved 14 June, 2012 from http://www.rep.routledge.com/article/P059

Knapp, D. (1998). *The Thessaloniki Declaration - The Beginning of the End of Environmental Education?* Environmental Communicator, Volume 8, Issue 2.

Knight, C. (1988). Casting off the Corsets: Letting the Curriculum Take its Natural Shape. In J. Rolfe (Ed.), *Environmental Education Through Outdoor Education: Proceedings of the Inaugural Conference of the New Zealand Association for Environmental Education. Christchurch, May 8-11, 1987*, pp. 3-12. Canterbury: New Zealand Association for Environmental Education.

Kochan, D. J. (2011). *'Learning' Research and Legal Education: A Brief Overview and Selected Bibliographical Survey.* Southwestern University of Law Review, Volume 40, p. 449, 2011; Chapman University Law Research Paper Number 11-16, http://ssrn.com.abstract=1807202

Kohlberg, L. (2007). In Ornstein, A. C., Pajak, E. F. & Ornstein, S. B. (Eds.) (2007). *Contemporary Issues in Curriculum – Fourth Edition*, pp. 179-192. USA: Pearson Education, Inc..

Kolb, D. A. (1984). *Experiential Learning: Experience as the Source of Learning and Development.* Englewood Cliffs, NJ: Prentice Hall.

Kolb, A. Y. & Kolb, D. A. (2005). *Learning Styles and Learning Spaces: Enhancing Experiential Learning in Higher Education.* Academy of Management Learning and Education, Volume 4, Issue 2, June 2005, pp. 193-212.

Kollmuss, A. & Agyeman, J. (2002). *Mind the Gap: Why do People Act Environmentally and What Barriers to Pro-environmental Behaviour?* Environmental Education Research, Volume 8, Issue 3, pp. 239-260.

Kopnina, H. (2011a). *Qualitative Revision of the New Ecological Paradigm (NEP) Scale for Children.* International Journal on Environmental Research, Volume 5, Issue 4, pp. 1025-1034.

Kopnina, H. (2011b). *Revisiting Education for Sustainable Development (ESD): Examining Anthropocentric Bias Through the Transition of Environmental Education to ESD.* Sustainable Development, online publication, 2 November, 2011. DOI: 10.1002/sd.529.

Korhonen, J. (2002). *The Dominant Economics Paradigm and Corporate Social Responsibility.* Corporate Social Responsibility and Environmental Management, Volume 9, Issue 1, pp. 66-79.

Korhonen, M. (2005). *Alcohol and Inuit Communities: Current Services and New Directions.* Presentation, Canadian Centre on Substance Abuse National Conference, Toronto, November 13-16, 2005. Retrieved on 16 May, 2012 from http://www.naho.ca/documents/it/2005_Alcohol_CCSA_presentation.pdf

Koul, R. B. & Zandvliet, D. (2009). *Place-based Learning Environments in India, Mauritius and Australia.* In Zandvliet, D. B. (Ed.) (2009), *Diversity in Environmental Education Research.* Rotterdam, The Netherlands: Sense Publishers, pp. 177-189.

Krebs, C. J. (2008). *The Ecological Worldview.* Victoria Australia: CSIRO Publishing.

Labohm, H. (2010). *Climate Change No Longer Scary in Europe.* Retrieved on 3 February 2011 from http://wattsupwiththat.com/2010/11/22/climate-change-no-longer-scary-in-europe/

Lai, J. C. (2010). *Māori Culture in the Modern World: Its Creation, Appropriation and Trade.* University of Lucerne, Switzerland, i-call Working Paper Number 02(2010).

Lankshear, C. (2012). *Illiteracy, Improper Literacy and the Development of an Underclass.* In Lauder, H. & Wylie, C. (Eds.) (2012), *Towards Successful Schooling.* New York: Routledge, Volume 185, pp. 175-182.

Lappe, F. M. (2007). *Getting a Grip 2: Clarity, Creativity and Courage for the World We Really Want*. Small Planet Media, www.smallplanet.org.

Larson, G. J. (1989). *"Conceptual Resources" in South Asia for "Environmental Ethics".* In Armstrong, S. J. & Botzler, R. G. (1993), *Environmental Ethics: Divergence and Confluence,* New York: McGraw-Hill, Inc., pp. 545- 552.

Lauder, H. & Wylie, C. (Eds.) (2012). *Towards Successful Schooling.* New York: Routledge.

Lautensach, A. (2003). *Environmental Ethics for the Future.* A thesis submitted for the degree of Doctor of Philosophy at the University of Otago, Dunedin, New Zealand.

Law, B. (2004). *Environmental Education/Education for Sustainability*. UNESCO/Japan Asia Pacific Environmental Education Research Seminar, pp. 92-105. UNESCO APEID.

Law, B. (2005). *Education for Sustainable Development in New Zealand*. Applied Environmental Education and Communication, Volume 4, pp. 277-281.

Law, B. & Baker, R. (1997). *A Case Study of Dilemmas and Tensions: the Writing and Consultation Process Involved in Developing a National Guideline Document for Environmental Education.* Environmental Education Research, Volume 3, Issue 2, pp. 225-232.

Lawson, D. (2013). *Pedagogic Research and Scholarship within the STEM Disciplines.* In Grove, M. & Overton, T. (Eds.) (2013) *Getting Started in Pedagogic Research within the STEM Disciplines.* University of Birmingham STEM Education Centre on behalf of the national HE STEM Programme, pp. 5-7. Retrieved on 22 May 2014 from http://eprints.chi.ac.uk/1162/1/Grove%20%26%20Overton%202014%20Getting%20started%20in%20Pedagogic%20Research%20in%20the%20STEM%20disciplines.pdf#page=9

Leiserowtz, A. A. (2005). *American Risk Perceptions: Is Climate Change Dangerous?* Risk Analysis, Volume 25, Issue 6, pp. 1433-1442.

Leiss, W. (1994). *The Domination of Nature.* Montreal: McGill-Queens University Press.

Leopold, A. (1949). *The Land Ethic.* In Armstrong, S. J. & Botzler, R. G. (1993), *Environmental Ethics: Divergence and Confluence*, 373-382. New York: McGraw-Hill.

Leopold, A. (1968). *A Sand County Almanac.* New York: Oxford University Press.

Lillisand, T. M. (1993). *The 'Grayware' Required to Deal with Global Change Issues.* Photogrammetric Engineering & Remote Sensing, Volume 59, Issue 6, pp. 961-968.

Lincoln Y. S. & Guba E. G. (1985). *Naturalistic Inquiry.* Newbury Park: Sage.

Linden, E. (2006). *The Winds of Change: Climate, Weather, and the Destruction of Civilizations.* New York: Simon & Schuster.

Lindenmayer, D. B. & Likens, G. E. (2010). *Effective Ecological Monitoring.* Victoria, Australia: CSIRO Publishing.

Linder, S. B. (1970). *The Harried Leisure Class.* New York: Columbia University Press.

Lipman, M. (2007). *Critical Thinking – What Can it Be?* In Ornstein, A. C., Pajak, E. F. & Ornstein, S. B. (2007). *Contemporary Issues in Curriculum – Fourth Edition*, pp. 161-169. USA: Pearson Education, Inc..

Lochhead, L. E. (1994). *Preserving the Brownies Portion: A History of Voluntary Nature Conservation Organisations in New Zealand 1888-1935.* Thesis, Ph.D., Lincoln University, Lincoln, New Zealand.

Lomborg, B. (2001). *The Skeptical Environmentalist: Measuring the real State of the World.* Cambridge, UK: Cambridge University Press.

Lomborg, B. (Ed.) (2004). *Global Crises, Global Solutions.* Cambridge, UK: Cambridge University Press.

Lomborg, B. (2007). *Cool It: The Skeptical Environmentalist's Guide to Global Warming.* New York: Alfred A. Knopf.

Lomborg, B. (2003). *The Real State of the World.* Sir Ronald Trotter Lecture, Delivered to the New Zealand Business Roundtable.

Lomborg, B. (2007). T*ackling Global Warming.* Retrieved on 11 June 2010 from http://sciblogs.co.nz/terms/2010/09/27/bjorn-lomborg-on-tackling-climate-change/

Lomborg, B. (2010). *Smart Solutions to Climate Change.* Cambridge University Press.

Longest, K. C. & Smith, C. (2011). *Conflicting or Compatible: Beliefs about Religion and Science Among Emerging Adults in the United States.* Social Forum, Volume 26, Issue 4, December 2011, pp. 846-869.

Lonsdale, A. R. (1978). A Syllabus: Primer 1 to Form 5. *Outdoor Education - Year Book of Education*, pp. 267-294. Wellington: New Zealand Education Institute.

Lovelock, J. (1991). *Gaia.* Sydney: Allen & Unwin.

Lucas, A. M. (1979). *Environment and Environmental Education: Conceptual Issues and Curriculum Implications.* Australia International Press and Publications Pty Limited.

Ludwig, D. Mangel, M. & Haddad, B. (2001). *Ecology, Conservation and Policy.* Annual Review of Ecology and Systematics, Volume 32, pp. 481-517.

Lyle, J. T. (1994). *Regenerative Design for Sustainable Development.* New York: Wiley Publishers.

Macdonald, D. (2010). *Curriculum Change and the Post-Modern World: Is the School Curriculum-Reform Movement an Anachronism?* Journal of Curriculum Studies, Volume 35, Issue 2, pp. 139-149.

Macedo, S. & Tamir, Y. (Eds.) (2002). *Moral and Political Education, Nomos XLIII.* New York: New York University Press.

Macfarlane, A. H. (2004). *Kia Hiwa Ra! – Listen to Culture: Māori Students Plea to Educators.* Wellington, New Zealand: New Zealand Council for Educational Research.

Macris, A. M. & Georgakellos, D. A. (2006). *A New Teaching Tool in Education for Sustainable Development: Ontology-based Knowledge Networks for Environmental Training.* Journal of Cleaner Production, Volume 14, Issues 9-12, pp. 855-867.

Magis, K. (2010). *Community Resilience: An Indicator of Social Sustainability.* Society of Natural Resources, Volume 23, pp. 857-885.

Mahoney, M. J. (1977). *Publication Prejudices: An Experimental Study of Confirmatory Bias in the Peer Review System.* Cognitive Therapy and Research, Volume 1, No. 2, 1977, pp.161-175.

Mahuta, R. T. (Chairman) (1974). *Māori Education.* A Report Prepared for the Working Party on Improving Learning and Teaching of the Educational Development Conference, Wellington, New Zealand.

Mallard, T. (2007). *Message from the Minister: Environment New Zealand 2007 – Summary*. Wellington: Ministry for the Environment and GP Publications. Retrieved on 3 May 2009 from http://www.mfe.govt.nz/publications/ser/enz07-summary-dec07/index.html

Malcolm, I. G. (2011). *Issues in English Language Assessment of Indigenous Australians.* Language Assessment Quarterly, Volume 8, Issue 2, pp. 190-199.

Mancl, L., Carr, K. & Morrone, M. (1999). *Environmental Literacy of Ohio Adults.* Ohio Journal of Science, Volume 99, Issue 3, pp. 57-61.

Mander, J. & Tauli-Corpuz, V. (Eds.) (2006). *Paradigm Wars: Indigenous Peoples' Resistance to Globalization.* San Francisco, United States of America: Sierra Club Books.

Mander, J. (1978). *Four Arguments for the Elimination of Television.* New York: Morrow.

Manhire, T. (2011). *John Key's Unhappy Week at BBC.* New Zealand Listener, 13 May, 2011. http://www.listener.co.nz/commentary/john-keys-unhappy-week-at-the-bbc/

Mann, S. (2011). *The Green Graduate: Educating Every Student as a Sustainable Practitioner.* Wellington, New Zealand: New Zealand Council for Educational Research.

Manning, R. E. (1986). *Studies in Outdoor Recreation: Search and Research for Satisfaction.* Oregon State University Press.

Manteaw, B. (2009). *Living in and off the Environment: Educating for Sustainable Development in an Unequal World.* In Zandvliet, D. B. (Ed.) (2009). *Diversity in Environmental Education Research.* Rotterdam, The Netherlands: Sense Publishers, pp. 159-175.

Manzoor. A. (2010). *Economic Dimensions of Sustainable Development, the Fight Against Poverty and Educational Responses.* International Review of Education, Volume 56. Numbers 2-3, pp. 235-253. DOI 10.1007/s11159-010-9166-8.

Māori Health (2006). *Ngā Awe o te Hauora: Socioeconomic Determinants of Health.* Statistics: Socioeconomic Determinants of Health. Retrieved on 27 September 2011 from http://www.Māorihealth.govt.nz/moh.nsf/indexma/socioeconomic-determinants-of-health

Mardon, H. & Ritchie, H. (2002). *Enviroschools Programme Evaluation Report.* Wellington: Enviroschools.

Marietta, D. E. Jr. (1988). *Environmental Holism and Individuals.* In Armstrong, S. J. & Botzler, R. G. (1993), *Environmental Ethics: Divergence and Confluence*, pp. 405-410. New York: McGraw-Hill, Inc..

Marlor, C. (2010). *Bureaucracy, Democracy and* Exclusion: *Why Indigenous Knowledge Holders Have a Hard Time Being Taken Seriously.* Springer Science+Business Media LLC 2010, Qual Sociol (2010) 33:513-531. DOI 10.1007/s11133-010-9168-7.

Marsden, M. (1992). In *Te Ao Hurihuri: Aspects of Māoritanga.* King, M., pp. 118-138. Auckland: Reed.

Marsick, V. J. & Watkins, K. E. (2001). *Informal and Incidental Learning.* New Directions for Adult and Continuing Education, Volume 2001, Issue 89, pp. 25-34.

Maslow, A. H. (1954). *Motivation and Personality.* New York: Harper.

Maslow, A. H. (1973). *Dominance, Self-esteem, Self-actualization: Germinal Papers of A.H. Maslow.* Edited by R. J. Lowry. Brookes/Cole Publishing Company.

Masten, A. S. (1998). *The Development of Competence in Favorable and Unfavorable Environments: Lessons from Research on Successful Children.* American Psychologist, Volume 53, Issue, February 1998, pp. 205-220.

Matsueda, R. L., Huizinga, D. & Kreager, D. A. (2006). *Deterring Delinquents: A Rational Choice Model of Theft and Violence.* American Sociological Review, Volume 71, Issue 1, February 2006, pp. 95-122.

Matunga, H. (1995). *Māori Participation in Outdoor Recreation: an Exploration of Research and Issues.* In P. J. Devlin, R. A. Corbett & C. J. Peebles (Eds.), *Outdoor Recreation in New Zealand: a Review of the Research Literature*, pp. 17-30. Wellington: Science Publications Unit, Science and Research Division, Department of Conservation.

May, S. (1994). *Making Multicultural Education Work.* Ontario Institute for Studies in Education. United Kingdom: Multilingual Matters Ltd..

Mayer, M. (1995). *Quality Indicators and Innovation in Environmental Education*. In Organisation for Economic Co-operation and Development, *Environmental Learning for the 21st Century*, pp. 31-46. Paris: Organisation for Economic Co-operation and Development.

Mayor, F. (1992). *Education for Sustainable Development: Taking up the Challenge.* Director-General of the United Nations Educational, Scientific and Cultural Organization (UNESCO) at the opening of the World Congress for Education and Communication on Environment and development (ECO-ED), Toronto, Ontario, 17 October, 1992. http://unesdoc.unesco.org/images/0009/000941/094157e.pdf

Maxwell, M. (2000). *Ecological Literacy: Developing a Curriculum for Sustainability.* Environmental Education and Information, Volume 19, Issue 2, pp. 115-130.

Mazur, L. (Ed.) (2010). *A Pivotal Moment: Population, Justice, and the Environmental Challenge.* Washington, D.C.: Island Press.

McCarthy, J. J., Canziani, O. F., Leary, N. A., Dokken, D. J. & White, K. S. (2001). *Climate Change 2001: Impacts, Adaptation, and Vulnerability:* A Report for the Intergovernmental Panel on Climate Change (IPCC). UK: The Press Syndicate of the University of Cambridge.

McCauley, R. N. & Lawson, E. T. (2002). *Bringing Ritual to Mind: Psychological Foundations of Cultural Forms.* UK: Cambridge University Press.

McConnell, B. & Law, B. (1992). *Outdoor and Environmental Education. A Developing Process at the Christchurch College of Education.* World Leisure and Recreation, Volume 34, Issue 2, Summer, pp. 32-36.

McConochie, N. (1966). *You'll Learn No Harm from the Hills.* Reprinted 1989. Auckland, New Zealand: Heinemann Reed Publishers.

McCormack, F. (2011). *Levels of Indigeneity: The Māori and Neoliberalism.* Journal of the Royal Anthropological Institute, Volume 17, Issue 2, June 2011, pp. 281-300.

McCright, A. M., Dunlap, R. E. & Xiao, C. (2013). *Perceived Scientific Agreement and Support for Governmental Action on Climate Change in the USA.* Climatic Change, Volume 119, Issue 2, pp. 511-518. Retrieved on 1 October, 2013 from http://link.springer.com/article/10.1007/s10584-013-0704-9.

McFadden, S. (1989). *Legend of the Rainbow Warriors.* Invocation by Ven. Dhyani Ywahoo. Harlem Writers Guild Press.

McGee, W. J. (1990). *The Conservation Mentality of Natural Resources.* In Armstrong, S. J. & Botzler, R. G. (1993), *Environmental Ethics: Divergence and Confluence*, pp. 289-291. New York: McGraw-Hill, Inc..

McGuigan, F. & Salmon, K. (2006). *The Influence of Talking on Showing and Telling: Adult-child Talk and Children's Verbal and Nonverbal Event Recall.* Applied Cognitive Psychology, Volume 20, Issue 3, April 2006, pp. 365-381.

McKay, D. J. (1997). *RCD, Rabbits and Scapegoats.* Unpublished paper, Department of Human and Leisure Sciences, Lincoln University, Canterbury, New Zealand.

McKay, D. J. (1997). *How Should Horticulturalists in New Zealand be Encouraged to Consider Alternative, Ecologically Sound Strategies?* Unpublished paper, Department of Human and Leisure Sciences, Lincoln University, Canterbury, New Zealand.

McKay, D. J. (1998). *What Do You Hear in 'Learning to Care': Understandings and Practices of Environmental Education.* A dissertation submitted in partial fulfilment of the requirements for the Degree of Master of Applied Science at Lincoln University, Canterbury, New Zealand.

McKinley, S. (2002). *Māori Parents and Education – Ko Ngā Mātua Māori me te Mātauranga.* Adapted by Anne Else. New Zealand Council for Educational Research, Wellington, New Zealand.

McKnight, D. M. (2010). *Overcoming "Ecophobia": Fostering Environmental Empathy Through Narrative in Children's Science Literature.* Frontiers in Ecology and the Environment, Volume 8, Issue 6, pp. e10-e15.

McLaren, P. (2007). *A Pedagogy of Possibility.* In Ornstein, A. C., Pajak, E. F. & Ornstein, S. B. (2007). *Contemporary Issues in Curriculum – Fourth Edition*, pp. 22-32. USA: Pearson Education, Inc..

McNatty, W. L. (2001). *Whanaungatanga.* Graduate paper, Department of Psychology, University of Waikato. Retrieved on 11 September 2011 from http://www.starlight.net.nz/bill/whanaungatanga.htm

McNeil, K. (1997). Covering letter for the Ministry for the Environment's summary of submissions made on the Ministry for the Environment's (1996) discussion document *Learning to Care For Our Environment: Perspectives on Environmental Education*. Wellington: Ministry for the Environment.

Mehrotra, R. (Ed.) (2006). *The Essential Dalai Lama: His Important Teachings.* London, Great Britain: Hodder & Stoughton.

Melko, M. (1995). *The Nature of Civilizations.* In Sanderson, S.K. (Ed.) (1995), *Civilizations and World Systems: Studying World Historical Change,* Altamira Press, pp. 25-45.

Merrill, R. T. & McElhinny, M. W. (1983). *The Earth's Magnetic Field: Its History, Origin and Planetary Perspective.* Cambridge University Press.

Milbrath, L. W. (1984). *Environmentalists: Vanguard for a New Society.* Albany: State University of New York Press.

Millard, J. & Springett, D. (1991). *Planting Native Trees: A New Zealand Natural Heritage Foundation Environmental Education Programme.* In D. Springett & C. Michael Hall (Eds.) *Our Common Future: the Way Forward, The Proceedings of the New Zealand Natural heritage Foundation International Conference on Environmental Education, Palmerston North, New Zealand, 26-30 August, 1991*, pp. 165-166. New Zealand Natural Heritage Foundation.

Miller, A. & Hopkins, R. (2013). *Climate After Growth: Why Environmentalists Must Embrace Post-Growth Economics and Community Resilience.* Post Carbon Institute and Transition Network.

Miller, D. R. (2004), *Western and Māori Values for Sustainable Development.* Retrieved on 21 November 2012 from http://www.firstfound.org/david%20miller.htm

Miller, L. J. & Metcalfe, J. (1998). *Strategically Speaking: The Problem of Essentializing Terms in Feminist Theory and Feminist Organizational Talk.* Human Studies, Volume 21, pp. 235-257. Retrieved on 23 January 2012 from http://link.springer.com/article/10.1023/A:1005379625641#page-1

Miller, R. (1996). *The Renewal of Education and Culture: A multifaceted Task.* Great ideas In Education, Volume 7, Number 5.

Millman, V. (2000). *Learning For Living: Opportunities and Approaches Within the School Curriculum 5-16.* In Field, J. & Leicester, M. (Eds.) (2000), *Lifelong Learning: Education Across the Lifespan.* London: RoutledgeFalmer, pp. 119-133.

Mills, J. & Birks, M. (Eds.) (2014). *Qualitative Methodology: A Practical Guide.* London: Sage.

Mills, J. & Birks, M. (2014). *Introducing Qualitative Research.* London: Sage.In Mills, J. & Birks, M. (Eds.) (2014), *Qualitative Methodology: A Practical Guide.* London: Sage.

Milne, R. O. H. (1994). *Rethinking Environmental Education - An Alternative Pathway to Green Lifestyles.* Report, M.Sc., Lincoln University, Lincoln, New Zealand.

Ministry for the Environment - Manatū Mō Te Taiao (1992). *Forging the Links: New Zealand's National Report to United Nations Conference on Environment and Development (UNCED).* Wellington: Ministry for the Environment and Ministry of External Relations and Trade.

Ministry for the Environment - Manatū Mō Te Taiao and the New Zealand Local Government Association Inc. (1994). *Taking Up the Challenge of Agenda 21: A Guide for Local Government*. Wellington: Ministry for the Environment.

Ministry for the Environment - Manatū Mō Te Taiao (1995a). *Environment 2010 Strategy: A Statement of the Government's Strategy on the Environment.* Wellington: Ministry for the Environment.

Ministry for the Environment - Manatū Mō Te Taiao (1995b). *Guide to Environmental Education for the Business Sector: A Joint Project between the Natural Gas Corporation and the Ministry for the Environment.* Wellington: Ministry for the Environment.

Ministry for the Environment - Manatū Mō Te Taiao (1996). *Learning to Care for Our Environment: Perspectives on Environmental Education: A Discussion Document.* Wellington: Ministry for the Environment.

Ministry for the Environment - Manatū Mō Te Taiao (1997a). *Learning to Care for Our Environment: Summary of Submissions Made on the Discussion Document Published in October 1996.* Wellington: Ministry for the Environment.

Ministry for the Environment - Manatū Mō Te Taiao (1997b). *The State of New Zealand's Environment 1997.* Wellington: Ministry for the Environment and GP Publications.

Ministry for the Environment - Manatū Mō Te Taiao (1998). *Learning to Care for Our Environment: Me Ako kit e Tiaki Taiao: A National Strategy for Environmental Education.* Wellington: Ministry for the Environment.

Ministry for the Environment - Manatū Mō Te Taiao (1999). *Environmental Education Directory New Zealand*. Wellington: Ministry for the Environment.

Ministry for the Environment - Manatū Mō Te Taiao (2006). *Gentle Footprints: Boots 'N' All.* Wellington, New Zealand: Ministry for the Environment - Manatū Mo Te Taiao.

Ministry for the Environment - Manatū Mō Te Taiao (2007a). *Environment New Zealand 2007: The Second National-level Report on the State of New Zealand's Environment.* Wellington, New Zealand: Ministry for the Environment and GP Publications. http://www.mfe.govt.nz/publications/ser/enz07-dec07/index.html

Ministry for the Environment - Manatū Mō Te Taiao (2007b). *Environment New Zealand 2007 – Summary*. Wellington, New Zealand: Ministry for the Environment and GP Publications. http://www.mfe.govt.nz/publications/ser/enz07-summary-dec07/index.html

Ministry for the Environment - Manatū Mō Te Taiao (1998-2012). *The Environment*. Retrieved on 3 July 2013 from http://www.mfe.govt.nz/issues/sustainable-industry/tools-services/concepts.php?id=13

Ministry for the Environment - Manatū Mō Te Taiao (1998-2012). *Sustainability: A Definition*. Retrieved on 3 July 2013 from http://www.mfe.govt.nz/issues/sustainable-industry/tools-services/definition.php

Ministry of Economic Development (2011). *Insights into New Zealand's Education Sector.* InvestmentNow.govt.nz: Investment, Connections, Opportunities, Lifestyle. Retrieved on 23 June 2013 from http://www.investmentnow.govt.nz/insights-into-new-zealands-education-sector_page93.html

Ministry of Agriculture and Forestry (2011). *Pest Management National Plan of Action.* Wellington, New Zealand: Ministry of Agriculture and Forestry.

Ministry of Education (1991). *The National Curriculum of New Zealand: A Discussion Document.* Wellington, New Zealand: Ministry of Education, Wellington.

Ministry of Education (1992). *Anywhere, Everywhere: EOTC Curriculum Guidelines for Primary Schools, Secondary Schools, and Early Childhood Centres*. Wellington, New Zealand: Learning Media.

Ministry of Education (1992). *Mathematics in the New Zealand Curriculum*. Wellington, New Zealand: Learning Media.

Ministry of Education (1993a). *Science in the New Zealand Curriculum*. Wellington, New Zealand: Learning Media.

Ministry of Education (1993b). *The New Zealand Curriculum Framework*. Wellington, New Zealand: Learning Media.

Ministry of Education (1994a). *Education for the 21st Century*. Wellington, New Zealand: Learning Media.

Ministry of Education (1994b). *English in the New Zealand Curriculum*. Wellington, New Zealand: Learning Media.

Ministry of Education (1995). *Technology in the New Zealand Curriculum*. Wellington, New Zealand: Learning Media.

Ministry of Education (1997). *Social Studies in the New Zealand Curriculum.* Wellington, New Zealand: Learning Media.

Ministry of Education (1999a). *The Arts in the New Zealand Curriculum: Draft*. Wellington, New Zealand: Learning Media.

Ministry of Education (1999b). *Guidelines for Environmental Education in New Zealand Schools.* Wellington, New Zealand: Learning Media.

Ministry of Education (1999c). *Health and Physical Education in the New Zealand Curriculum*. Wellington, New Zealand: Learning Media.

Ministry of Education (2007a). *The New Zealand Curriculum.* Wellington, New Zealand: Learning Media Limited.

Ministry of Education (2007b). *The New Zealand Curriculum for English-medium Teaching and Learning in Years 1 – 13.* Wellington, New Zealand: Learning Media Limited.

Ministry of Education (2007c). *Statement of Intent 2007-2012.* Wellington, New Zealand: Ministry of Education.

Ministry of Education (2009a). *Being Part of Global Communities: Building Conceptual Understandings in the Social Sciences.* Wellington, New Zealand: Learning Media.

Ministry of Education (2009b). *Ngā Arohaehae Whai Hua: Self Review Guidelines For Early Childhood Education.* Wellington, New Zealand: Ministry of Education.

Ministry of Education (2010a). *Intent: Statement of Intent, 2010-2015.* Wellington, New Zealand: Ministry of Education.

Ministry of Education (2010b). *Developing Key Competencies in EfS.* New Zealand Curriculum Guides: Senior Secondary. Retrieved on 29 November 2012 from http://seniorsecondary.tki.org.nz/Social-sciences/Education-for-sustainability/Pedagogy/Developing-key-competencies-in-EfS

Ministry of Foreign Affairs and Trade (1996). *Convention on Biological Diversity: Third Conference of the Parties, Buenos Aires, Argentina, 4 to 15 November, 1996: New Zealand Delegation Report*. Wellington, New Zealand: Ministry of Foreign Affairs and Trade.

Ministry of Health (2008). *Drinking-water Standards for New Zealand 2005 (Revised 2008).* Wellington, New Zealand: Ministry of Health.

Ministry of Māori Affairs Natural Resource Unit (1991). *Māori Values and Environmental Management*. Wellington, New Zealand: Manatu Māori.

Mitchell, D. B. & Mueller, M. P. (2011). *A Philosphical Analysis of David Orr's Theory of Ecological Literacy: Biophilia, Ecojustice and Moral Education in School Learning Communities.* Cultural Studies of Science Education. Volume 6, Issue 1, pp. 193-221.

Mitchell, W. J. T. (1986). *Iconology: Image, Text, Ideology.* London: The University of Chicago Press Limited.

Mohan, G. & Stokke, K. (2000). *Participatory Development and Empowerment: The Dangers of Localism.* Third World Quarterly, Volume 21, Issue 2, pp., 247-268. Retrieved on 18 March, 2012 from http://www.tandfonline.com/doi/pdf/10.1080/01436590050004346

Mol, A. P. J. & Spaargaren, G. (2000). *Ecological Modernisation Theory in Debate: A Review.* Environmental Politics, Volume 9, Issue 1, pp. 17-49. Retrieved on 19 October 2012 from http://www.vedegylet.hu/okopolitika/Mol%20-%20Ecomodern%20Review.pdf

Moller, H. & Lyver, P. O'B. (2010). *Traditional Ecological Knowledge for Improved Sustainability: Customary Wildlife Harvests by Māori in New Zealand.* In Walker Painemilla, K., Rylands, A. B., Woofter, A. & Hughes, C. (Eds.) (2010). *Indigenous Peoples and Conservation: From Rights to Resource Management.* USA: Conservation International, pp. 219-234.

Mollison, B. & Slay, R. M. (1991). *Introduction to Permaculture.* New South Wales, Australia: Tagari Publications.

Molner, A. (2003). *Cashing in on the Classroom.* In Slater Stern, B. & Kysilka, M. L. (Eds.) (2008), *Contemporary Readings in Curriculum.* Thousand Oaks, California, United States of America: Sage Publications, Inc..

Monroe, M. C. (2003). *Two Avenues for Encouraging Conservation Behaviours.* Human Ecology Review, Volume 10, Issue 2, pp. 113-125.

Moody, G., Alkaff, H., Garrison, D. & Golley, F. (2005). *Assessing the Environmental Literacy Requirements at the University of Georgia.* Journal of Environmental Education, Volume 36, Issue 4, pp. 3-9.

Moody, G. L. & Hartel, P. G. (2007). *Evaluating an Environmental Literacy Requirement Chosen as Method to Produce Environmentally Literate University Students.* International Journal of Sustainability in Higher Education, Volume 8, Issue 3, pp. 355-370.

Mooney, C. (2006). *The Republican War on Science.* New York: BasicBooks.

Moore, J. (2005). *Seven Recommendations for Creating Sustainability Education at the University Level: A Guide for Change Agents.* International Journal of Sustainability in Higher Education, Volume 6, Issue 4, pp. 326-339.

Morgan, T. K. K. B. (2004). *A Tāngata Whenua Perspective on Sustainability Using the Mauri Model.* Proceedings of the first NZSSES Conference. In Miller, D. R. (2004), *Western and Māori Values for Sustainable Development.* Retrieved on 21 November 2012 from http://www.firstfound.org/david%20miller.htm

Moss, P. (2010). *We Cannot Continue As We Are: The Educator in an Education for Survival.* Contemporary Issues in Early Childhood, Volume 11, Issue 1, pp. 8-19.

Munslow, B. & O'Dempsey, T. (2010). *From War on Terror to War on Weather? Rethinking Humanitarianism in a New Era of Chronic Emergencies.* Third World Quarterly, Volume 31, Issue 8, pp. 1223-1235.

Murdy, W. H. (1975). *Anthropocentrism: A Modern View.* In Armstrong, S. J. & Botzler, R. G. (1993). *Environmental Ethics: Divergence and Convergence*, pp. 302-309. New York: McGraw-Hill, Inc..

Myers, N. (1991). *Rainforest: The Disappearing Forests.* In Porritt, J. (1991) *Save the Earth.* London: Dorling Kindersley Limited.

NAAEE (North American Association for Environmental Education) (2011a). *Developing a Framework for Assessing Environmental Literacy: Executive Summary.* American Association for Environmental Education (NAAEE), Washington, USA, http://www.naaee.net/

NAAEE (North American Association for Environmental Education) (2011b). *A Proposed Framework for the Programme for International Student Assessment (PISA) 2015.* North American Association for Environmental Education (NAAEE), Washington, USA, http://www.naaee.net/

Nair, I., Jones, S. & White, J. (2002). *A Curriculum to Enhance Environmental Literacy.* Journal of Engineering Education, Volume 91, Issue 1, pp. 57-67.

Negra, C. & Manning, R. E. (1997). *Incorporating Environmental Behaviour, Ethics, and Values into Nonformal Environmental Education Programmes.* The Journal of Environmental Education, Volume 28, Issue 2, pp. 10-21.

Neill, J. T., & Dias, K. L. (2001). *Adventure Education and Resilience: The Double-edged Sword.* Journal of Adventure Education and Outdoor Learning, Volume 1, Issue 2, pp. 35-42.

Nelson, T. (2010). *When Disaster Strikes: On the Relationship Between Natural Disaster and Interstate Conflict.* Global Change, Peace and Security, Volume 22, Issue 2, June 1020, pp. 155-174.

New South Wales Department of Education and Training (2001). *Environmental Education Policy for Schools.* Bankstown: DET.
New Zealand Department of Education (1986). *Policy Statement on Education Outside the Classroom.* Wellington, New Zealand: Department of Education.

New Zealand Government (1840). *Treaty of Waitangi, 6 February, 1840*. Wellington, New Zealand: National Archives.

New Zealand Government (1989). *The Education Act*. Wellington: New Zealand Government.

New Zealand Government (1986). *The Māori Language Act.* Wellington: New Zealand Government.

New Zealand Government (1991). *The Resource Management Act 1991*. Wellington: New Zealand Government.

Nisbet, E. K., Zelenski, J. M. & Murphy, S. A. (2011). *Happiness is in our Nature: Exploring Nature Relatedness as a Contributor to Subjective Well-being*. Journal of Happiness Studies, Volume 12, Issue 2, pp. 303-322.

NIWA (2006). *Traditional Māori Weather and Climate Forecasting.* Poster Number 4. Wellington, New Zealand: NIWA.

Noberg, J. & Cumming, G. (Eds.) (2008). *Complexity Theory for a Sustainable Future.* New York: Columbia University Press.

Noddings, N. (2004). *War, Critical Thinking, and Self-Understanding.* In Slater Stern, B. & Kysilka, M. L. (Eds.) (2008), *Contemporary Readings in Curriculum.* Thousand Oaks, California: Sage Publications, Inc..

Nomaguchi, K. M. & Bianchi, S. M. (2004). *Exercise Time: Gender Differences in the Effects of Marriage, Parenthood, and Employment.* Journal of Marriage and family, Volume 66, Issue 2, May 2004, pp. 413-430. DOI: 10.1111/j.1741-3737.204.00029.x

Norris, F. H., Stevens, S. P., Pfefferbaum, B., Wyche, K. F. & Pfefferbaum, R. L. (2008). *Community Resilience as a Metaphor, Theory, Set of Capacities, and Strategy for Disaster Readiness.* American Journal of Community Psychology, Volume 41, Issue 1-2, pp. 127-150. Retrieved on 23 June 2013 from http://link.springer.com/article/10.1007/s10464-007-9156-6

Nottale, L. (1993). *Fractal Space-Time and Microphysics: Towards a Theory of Scale Relativity.* Singapore: World Scientific Publishing Company.

Nyong, A., Adesina, F. & Osman Elasha, B. (2007). *The Value of Indigenous Knowledge in Climate Change Mitigation and Adaptation Strategies in the African Sahel.* Mitigation and Adaptation Strategies for Global Change, Volume 12, Number 5, pp. 787-797, DOI: 10.1007/s11027-007-9099-0

Oats, W.N. (2001). *Nurturing the Human Spirit.* In Campbell, J. (Ed.) (2001). *Creating Our Common Future: Educating for Unity in Diversity.* Published jointly by the United Nations Educational, Scientific and Cultural Organization, and Berghahn Books, United States of America, pp. 45-60.

Oberski, I. (2011). *Rudolph Steiner's Philosophy of Freedom as a Basis for Spiritual Education?* International Journal of Children's Spirituality, Volume 16, Issue 1, February 2011, pp. 5-17.

OECD (1996). *Knowledge Bases for Education Policies.* Proceedings of a Conference held in Maastricht, The Netherlands, on 11-13 September, 1995.

Oreskes, N. & Conway, E. M. (2013). *The Collapse of Western Civilisation: A View from the Future.* Dœdalus, The Journal of the American Academy of Arts and Sciences, Volume 142, Issue 1, pp. 40-58.

O'Riordan, T. (1995). *Environmental Science for Environmental Management.* Harlow: Longman Group Limited.

O'Riordan, T. (1989). *The Challenge for Environmentalism.* In Peet, R. & Thrift, N. (Eds.) (1989), *New Models in Geography, Volume 1.* Second edition. London: Routledge, pp. 77-102.

Ornstein, A. C., Pajak, E. F. & Ornstein, S. B. (2007a). *Contemporary Issues in Curriculum – Fourth Edition.* USA: Pearson Education, Inc..

Ornstein, A. C. (2007a). *Philosophy as a Basis for Curriculum Decisions.* In Ornstein, A. C., Pajak, E. F. & Ornstein, S. B. (2007). *Contemporary Issues in Curriculum – Fourth Edition*, pp. 5-12. USA: Pearson Education, Inc..

Ornstein, A. C. (2007b). *Education, Equality and Equity.* In Ornstein, A. C., Pajak, E. F. & Ornstein, S. B. (2007). *Contemporary Issues in Curriculum – Fourth Edition*, pp. 428-443. USA: Pearson Education, Inc..

Orr, D. (1990). *Environmental Education and Ecological Literacy: Knowing, Caring and Practical Literacy.* Holistic Education Review. Prakken Publications.

Orr, D. (1992a). *Ecological Literacy. Education and the Transition to a Postmodern World.* Albany: State University of New York Press.

Orr, D. (1992b). *Environmental Literacy: Education as if the Earth Mattered.* Twelfth Annual E. F. Schumacher Lectures, October 1992, Great Barrington, Massachusetts. Edited by Hildegarde Hannum.

Orr, D. (1994). *Earth in Mind: On Education, Environment and the Human Prospect.* Washington D.C.: Island Press.

Orr, D. (1999). *Reassembling the Pieces: Ecological Design and the Liberal Arts.* In Smith, G. A. & Williams, D. R. (1999), *Ecological Education in Action: on Weaving Education, Culture and the Environment*. State University of New York Press, New York, pp. 229-236.

Orr, D. (2001). *Foreword.* In Sterling, S. (2001). *Sustainable Education: Re-Visioning Learning and Change.* Totnes: Green Books for the Schumacher Society, pp. 7-9.

Overholt, T. W. and Calicott, J. B. (1982). *Clothed-in-Fur and Other Tales: An Introduction to an Ojibwa World View*. University Press of America, New York. In Williams, J. (2004). *'E Pākihi Hakinga a Kai: An Examination of Pre-contact Resource Management Practice in Southern Te Wāi Pounamu.* A Thesis Submitted for the Degree of Doctor of Philosophy of the University of Otago (Te Whare Wānanga o Otāgo), Dunedin, New Zealand.

Owen, R. (1861). *Palaeontology. Edinburgh.* Adam and Charles Black. Leith Storage 9DIE O.

Oxford, R. L. & Lin, J. (Eds.) (2012). *Transformative Eco-Education for Human and Planetary Survival.* A Volume in *Transforming Education for the Future.* USA, Information Age Publishing Limited.

Pachauri, R. (2012). Interview: Rajendra Pachauri on what IPCC AR5 may reveal. Retrieved on 09 September 2013 from http://www.rtcc.org/2013/09/03/ipcc-chief-pachauri-says-climate-fight-five-minutes-to-midnight/

Palmer, J. A. (1998). *Environmental Education in the 21st Century: Theory, Practice, Progress and Promise.* London: Routledge.

Palmer, J. & Neal, P. (1994). *The Handbook of Environmental Education.* London: Routledge.

Palliser, A. (2005). *An Examination of the Vision and Challenge of Education for Sustainability in State Secondary School Education in the UK.* Unpublished Paper in the authors possession.

Panelli, R. & Tipa, G. (2007). *Place Well-being: A Māori Case Study of Cultural and Environmental Specificity.* EcoHealth, Volume 4, Issue 4, pp. 445-460. DOI: 10.1007/s10393-007-0133-1.

Panelli, R. & Tipa, G. (2009). *Beyond Foodscapes: Considering Geographies of Indigenous Well-being.* Health and Place, Volume 15, Issue 2, pp. 455-465. DOI: 10.1016/j.helathplac.2008.08.005.

Paris, R. (2001). *Human Security: Paradigm Shift or Hot Air?* International Security, Volume 26, Number 2, pp. 87-102. Retrieved on 12 May 2011 from http://www.mitpressjournals.org/doi/abs/10.1162/016228801753191141

Park, G. (2006). *Theatre Country: Essays on Landscape and Whenua.* Wellington, New Zealand: Victoria University Press.

Parliamentary Commissioner for the Environment (PCE) (2002). *Creating our Future: Sustainable Development for New Zealand.* Wellington, New Zealand: PCE.

Patton, M. Q. (2002). *Qualitative Research and Evaluation Methods (3rd Edition).* California: Sage Publications.

Payne, P. G. (2006). *Environmental Education and Curriculum Theory.* The Journal of Environmental Education, Volume 37, Issue 2, pp. 25-35. Retrieved on 9 May 2011 from http://www.tandfonline.com/doi/abs/10.3200/JOEE.37.2.25-35

Payne, J. D., Tucker, M. A., Ellenbogen, J. M., Wamsley, E. J., Walker, M. P., Schacter, D. L. & Stickgold, R. (2012). *Memory for Semantically Related and Unrelated Declarative Information: The Benefit of Sleep, the Cost of Wake.* PLoS ONE, Volume 7, Issue 3. doi:10.1371/journal.pone.0033079.

Pearcey, N., Thaxton, C. (1994). *The Soul of Science: Christian Faith and Natural Philosophy.* Wheaton, USA: Crossway Books.

Pedretti, E. & Nazir, J. (2011). *Currents in STSE Education: mapping a Complex Field, 40 Years on.* Science Education, Volume 95, Issue, 4, July 2011, pp. 601-626.

Pe'er, S., Goldman, D. & Yavetz, B. (2007). *Environmental Literacy in Teacher Training: Attitudes, Knowledge, and Environmental Behaviour off (sic) Beginning Students.* Journal of Environmental Education, Volume 39, Issue 1, pp. 45-59.

Penn, D. J. (2003). *The Evolutionary Roots of Our Environmental Problems: Toward a Darwinian Ecology.* The Quarterly Review of Biology, Volume 78, Issue 3, p. 275.

Pepper, D. (1986). *The Roots of Modern Environmentalism.* London: Routledge.

Perkins, D. (2004). *Knowledge Alive.* In Slater Stern, B. & Kysilka, M. L. (Eds.) (2008), *Contemporary Readings in Curriculum.* Thousand Oaks, California: Sage Publications, Inc..

Perkins, H.C. & Thorns, D.C. (2001). *A Decade On: Reflections on the Resource Management Act 1991 and the Practice of Urban Planning in New Zealand.* Environment and Planning B: Planning and Design 2001, Volume 28, pp. 639-654.

Peters, E. & Slovic, P. (1996). *The Role of Affect and Worldviews as Orienting Dispositions in the Perceptions and Acceptance of Nuclear Power.* Journal of Applied Social Psychology, Volume 26, issue 16, pp. 1427-1453. Retrieved on 18 April 2012 from http://onlinelibrary.wiley.com/doi/10.1111/j.1559-1816.1996.tb00079.x/abstract

Peters, H. P. (1993). *In Search for Opportunities to Raise 'Environmental Risk Literacy'.* Toxicological and Environmental Chemistry, Volume 40, Issue 1-4, pp. 289-300.

Petheram, L., Zander, K. K., Campbell, B. M., High, C. & Stacey, N. (2010). *'Strange Changes': Indigenous Perspectives of Climate Change and Adaptation in NE Arnhem Land (Australia).* Global Environmental Change, Volume 20, Issue 4, pp. 681-692.

Phellas, C. N., Bloch, A. & Seale, C. (2011). *Structured Methods: Interviews, Questionnaires and Observation.* Doing Research, Chapter 11, Sage Publications, pp.182-202. Retrieved on 25 November 2013 from http://www.sagepub.com/upm-data/47370_Seale_Chapter_11.pdf

Phillips, D.C. (Ed.) (2000). *Constructivism in Education: Opinions and Second Opinions on Controversial Issues.* Ninety-ninth Yearbook of the National Society for the Study of Education, Part I, 5835 Kimbark Avenue, Chicago, Illinois, United States of America.

Piaget, J. (1978). *Success and Understanding.* Cambridge, USA: Harvard University Press,.

Pihama, L., Smith, K., Taki, M. & Lee, J. (2004). *A Literature Review on Kaupapa Māori and Māori Education Pedagogy.* Report prepared for Institutes of Technology and Polytechnics New Zealand (ITP) by the International Research Institute for Māori and Indigenous Education (IRI). Retrieved on 21 November, 2013 from https://akoaotearoa.ac.nz/mi/download/ng/file/group-199/a-literature-review-of-kaupapa-maori-and-maori-education-pedagogy.pdf

Piltz, R. (2008). *The Denial Machine.* Index on Censorship, Volume 37, Issue 4, pp. 72-81. Routledge Journals, Taylor Francis Ltd.

Porritt, J. (1991). *Save the Earth.* London: Dorling Kindersley Limited.

Plumwood, V. (2002). *Environmental Culture: The Ecological Crisis of Reason.* London: Routledge.

Pollack, R. (1994). *Signs of Life: The Language and Meaning of DNA.* New York: Houghton Mifflin Company.

Pollini, J. (2009). *Agroforestry and the Search for Alternatives to Slash-and-Burn Cultivation: From Technological Optimism to a Political Economy of Deforestation.* Agriculture, Ecosystems and Environment, Volume 133, Issues 1-2, pp. 48-60. Retrieved on 30 June 2012 from http://www.sciencedirect.com/science/article/pii/S0167880909001418

Popham, W. J. (2004). *Curriculum Matters.* In Slater Stern, B. & Kysilka, M. L. (Eds.) (2008), *Contemporary Readings in Curriculum.* Thousand Oaks, California: Sage Publications, Inc..

Porritt, J. (1991). *The Way Forward: Celebrating the Earth* in Porritt, J. (1991) *Save the Earth.* London: Dorling Kindersley Limited.

Porritt, J. (2006). *Capitalism as if the World Matters.* London: Earthscan.

Power, C. N. (2001). *UNESCO's Response to the Challenge of Establishing Unity in Diversity.* In Campbell, J. (Ed.) (2001), *Creating Our Common Future: Educating for Unity in Diversity,* Published jointly by the United Nations Educational, Scientific and Cultural Organization, and Berghahn Books, United States of America, pp.61-78.

Prance, G. T. (1991). *A Wealth of Species*. In Porritt, J. (1991) *Save the Earth.* London: Dorling Kindersley Limited.

Pritchard, P. E. (2011). *The Environmental Beliefs, Values and programmes of New Zealand Outdoor Tertiary Education Teachers.* Thesis submitted as fulfilment of the requirements of the Degree of Master of Physical Education at the University of Otago, Dunedin, New Zealand.

Priest, S. (1986). *Redefining Outdoor Education: A Matter of Many Relationships.* The Journal of Environmental Education, Volume 17, Issue 3, pp. 13-15. Retrieved 12 July 2011 from http://www.tandfonline.com/doi/abs/10.1080/00958964.1986.9941413

Prober, S. M., O'Connor, M. H. & Walsh, F. J. (2011). *Australian Aboriginal Peoples' Seasonal Knowledge: a Potential Basis for Shared Understanding in Environmental Management.* Ecology and Society, Volume 16, Number 2, Article 12, online version. Retrieved on 1 march 2012 from http://www.ecologyandsociety.org/vol16/iss2/art12/

Pyle, R. M. (2003). *Nature Matrix: Reconnecting People and Nature.* ORYX, Volume 37, Issue 2, pp. 206-214.

Quayle, M. (1995). *Urban Greenways and Public Ways: Realizing Public Ideas in a Fragmented World*. Landscape and Urban Planning, Volume 33, Issue 1-3, pp. 461-475.

Ramphal, S. S. (1990). *Endangered Earth.* In Angell D.J.R, Comer J.D. & Wilkinson M.L.N. (Eds.) (1990), *Sustaining Earth: Response to the Environmental Threat.* London: Macmillan Academic and Professional Ltd..

Rassool, N. (1999). *Literacy for Sustainable Development in the Age of Information.* Clevedon: Multilingual Matters.

Raven, P. (1991). *The Importance of Diversity.* In Porritt, J. (1991) *Save the Earth.* London: Dorling Kindersley Limited.

Rawlings, M. L. (1992). *Advocating Sustainable Lifestyles: The Case for Contemporary Environmental Education.* Thesis, M.Sc., Lincoln University, Lincoln, New Zealand.

Rata, E. (2011a). *Discursive Strategies of the Māori Tribal Elite.* Critique of Anthropology, Volume 31, Issue 4, December 2011, pp. 359-380.

Rata, E. (2011b). *A Critical Inquiry into Indigenous Knowledge Claims*. A paper presented to the Department of Education, University of Cambridge. Retrieved on 21 November 2013 from http://www.educ.cam.ac.uk/research/academicgroups/equality/Rata2-4.pdf

Redclift, M. (2005). *Sustainable Development (1987-2005): an Oxymoron Comes of Age.* Sustainable Development, Volume 13, Issue 4, pp. 212-227. DOI: 10.1002/sd.281. Retrieved on 27 September, 2013 from http://onlinelibrary.wiley.com/doi/10.1002/sd.281/full

Reed, A.W. & Calman, R. (2004). *Reed Book of Māori Mythology.* New Zealand: Reed Publishing, New Zealand Limited.

Rees, M. (2005). *Is This Our Final Century?* Presentation, TEDGlobal2005, Filmed July 2005, Oxford, England, Posted January 2007. http://www.ted.com/talks/martin_rees_asks_is_this_our_final_century.html

Reid, A. & Scott, W. (Eds.) (2008). *Researching Education and the Environment: Retrospect and Prospect.* Oxon: Routledge.

Rickinson, M. (2001). *Learners and Learning in Environmental Education: A Critical Review of the Evidence*. Environmental Education Research, Volume 7, pp. 207-326.

Rieber, L. P. (1996). *Seriously Considering Play: Designing Interactive Learning Environments based on the Blending of Microworlds, Simulations, and Games.* Educational Technology Research and Development, Volume 44, Number 2, pp. 43-58. DOI: 10.1007/BF02300540. http://www.springerlink.com/content/g85t307215n48202/

Riley, B. (2011). *A Garden in my Apartment.* Presentation, TEDxManhattan, Filmed May 2011, New York, United States of America, posted November 2011. http://www.ted.com/talks/britta_riley_a_garden_in_my_apartment.html?utm_source=feedburner&utm_medium=feed&utm_campaign=Feed%3A+TEDTalks_video+%28TEDTalks+Main+%28SD%29+-+Site%29

Rivers, I. & Soutter, A. (1996). *Bullying and the Steiner School Ethos: A Case Study Analysis of a Group-centred Educational Philosophy.* Scholl Psychology International, Volume 17, issue 4, November 1996, pp. 359-377.

Roberts, M. (2000). *Genetically Modified Organisms and Māori: a Critique of the ERMA Process for Assessing Cultural Effects Under the HSNO Act, 1996.* Winston Churchill Memorial Trust, London. In Williams, J. (2004). *'E Pākihi Hakinga a Kai: An Examination of Pre-contact Resource Management Practice in Southern Te Wāi Pounamu.* A Thesis Submitted for the Degree of Doctor of Philosophy of the University of Otago (Te Whare Wānanga o Otāgo), Dunedin, New Zealand.

Roberts, M. (2010). Personal Comments delivered as part of presentation during the Environmental Risk Management Authority's Tikanga & Technology II Wananga at Te Whare o Toroa, Whakatāne, New Zealand.

Robertson, W. A. (1993). *New Zealand's New Legislation for Sustainable Resource Management: The Resource Management Act 1991.* Land Use Policy, Volume 10, Issue 4, October 1993, pp. 303-311.

Robinson, J. P. (1981). *Television and Leisure Time: A New Scenario.* Journal of Communication, Volume 31, Issue 1, March 1981, pp. 120-130. DOI: 10.1111/j.1460-2466.1981.tb01211.x

Robinson, K. (2006). *Ken Robinson Says Schools Kill Creativity.* http://www.ted.com/talks/ken_robinson_says_schools_kill_creativity.html?qsha=1&utm_expid=166907-20&utm_referrer=https%3A%2F%2Fwww.ted.com%2Fspeakers%2Fsir_ken_robinson.html

Robinson, K. (2010). *Bring on the Learning Revolution!* https://www.ted.com/talks/sir_ken_robinson_bring_on_the_revolution.html

Robinson, K. (2013). *How to Escape Education's Death Valley.* https://www.ted.com/talks/ken_robinson_how_to_escape_education_s_death_valley.html

Robottom, I. (Ed.) (1987). *Environmental Education: Practice and Possibility.* Victoria, Australia: Deakin University.

Robottom, I. (1987). *Towards Inquiry-based Professional Development in Environmental Education.* In Robottom, I. (Ed.) (1987), *Environmental Education: Practice and Possibility.* Victoria, Australia: Deakin University, pp. 83-119.

Robottom, I. (2012). *Socio-Scientific Issues in Education: Innovative Practices and Contending Epistemologies.* Research in Science Education, Volume 42, Issue 1, January 2012, pp. 95-107.

Rodman, J. (1983). *Ecological Sensibility.* In Armstrong, S. J. & Botzler, R. G. (1993), *Environmental Ethics: Divergence and Confluence*, pp. 382-386. New York: McGraw-Hill, Inc..

Roff, D. A. (1992). *The Evolution of Life Histories: Theory and Analysis.* New York: Chapman and Hall.

Rojek, C. (1995). *Decentring Leisure: Rethinking Leisure Theory*. London: Sage Publishing Limited.

Ross, A., Pickering Sherman, K., Snodgrass, J. G., Delcore, H. D. & Sherman, R. (2011). *Indigenous Peoples and the Collaborative Stewardship of Nature: Knowledge Binds and Institutional Conflicts.* California: Left Coast Press, Inc..

Roszak, T. (1992). *The Voice of the Earth.* New York: Simon & Schuster Inc..

Rotarangi, S. (2011). *Planted Forests on Ancestral Land: The Experiences and Resilience of Māori Land Owners.* A thesis submitted for the degree of Doctor of Philosophy at the University of Otago, Dunedin, New Zealand.

Roth, R. E. (1970*). Fundamental Concepts for Environmental Management Education (K-16)*. In C. Schoenfeld (Ed.), *Outlines of Environmental Education*, pp. 65-74. Madison: December Educational Research Services.

Roth, C. E. (1991). *Towards Shaping Environmental Literacy for a Sustainable Future*. Standardization News, Volume 19, Issue 4, pp. 42-45.

Roth, C. E. (1992). *Environmental Literacy: Its Roots, Evolution and Directions in the 1990s.* Columbus, Ohio: ERIC Clearinghouse for Science, Mathematics, and Environmental Education.

Roth, C. E. (2008). *Paul F-Brandwein Lecture 2006: Conservation Education for the 21st Century and Beyond.* Journal of Science Education and Technology, Volume 17, Number 3, June 2008, pp. 211-216, DOI: 10.1007/s10956-006-9023-5.

Rowland, D. T. (2012). *Family Change.* Population Aging, International Perspectives on Aging, Volume 3, Part 2, pp. 121-133. Retrieved on 19 March 2013 from http://www.springerlink.com/content/g88v261703q21q84/

Royal, Te Ahukaramū Charles (1996). *Adventures in Mātauranga Māori: Some Thoughts on a Kawa of Māori Knowledge.* A paper delivered to a post-graduate seminar, Te Kawa-a-Māui, Department of Māori Studies, Victoria University of Wellington, 31 May. Retrieved on 8 June, 2013 from http://www.charles-royal.com/assets/kawaandmätauranga.pdf

Royal, Te Ahukaramū Charles (2002). *Indigenous Worldviews: A Comparative Study.* A report on research in progress for Ngāti Kikopiri, Te Wananga o Raukawa, Te Puni Kōkiri-Ministry for Māori Development, Fullbright New Zealand, Winston Churchill Memorial Trust. Wellington, New Zealand: Winston Churchill Memorial Trust.

Royal, Te Ahukaramū Charles (2007). *The Purpose of Education: Perspectives Arising from Mātauranga Māori*. Version 4, web version published February 2007, at www.mkta.co.nz.

Royal, Te Ahukaramū Charles (2009). *Te Ara - the Encyclopaedia of New Zealand*. Updated 1-Mar-09. URL: http://www.TeAra.govt.nz/en/te-ao-marama-the-natural-world/1-6

Royal, Te Ahukaramū Charles (2010). *Ecology and Indigeneity: Some Thoughts from Mātauranga Māori.* Abstract, Plenary Presentation, New Zealand Ecological Society Conference, 22-25 November 2010, University of Otago, Dunedin. Retrieved on 8 May 2011 from http://biodiversityvoice.files.wordpress.com/2010/10/cultural-symposium-abstracts.pdf

Royal, Te Ahukaramū Charles (2012). *Māori Creation Traditions*. Te Ara – the Encyclopaedia of New Zealand, updated 9 November 2012. http://www.TeAra.govt.nz/en/maori-creation-traditions

Ruiz Ruiz, J. (2009). *Sociological Discourse Analysis: Methods and Logic.* Forum Qualitative Sozialforschung / Forum Qualitative Social Research, Volume 10, Number 2, Article 26, May 2009.

Rumbles, W. (1999). *Treaty of Waitangi Settlement Process: New Relationship or New Mask?* Paper presented at the Compromising post/Colonialism Conference, Wollongong, Australia, 10-13 February 1999.

Russell, K. (2000). *Landscape: Perceptions of Kai Tahu I Mua, Āianei, A Muri Ake.* A Thesis Submitted for the Degree of Doctor of Philosophy of the University of Otago (Te Whare Wānanga o Otāgo), Dunedin, New Zealand.

Ryan, P. M. (1997). *The Reed Dictionary of Modern Māori*. Reed Publishing, New Zealand Limited, Auckland, New Zealand.

Sadler, H. (2007). *Mātauranga Māori (Māori Epistemology).* International Journal of the Humanities, Volume 4, Number 10, pp. 33-45.

Salmond, A. (1985). *Māori Epistemologies.* Chapter 12 in Overing, J. (Ed) (1985). *Reason and Morality*. London: Tavistock Publications.

Sanderson, S. K. (Ed.) (1995). *Civilizations and World Systems: Studying World Historical Change.* Altamira Press.

Sanga, K. & Thaman, K. H. (Eds.) (2009). *Re-thinking Education Curricula in the Pacific: Challenges and Prospects.* Wellington, New Zealand: He Parekereke, Institute for Research and Development in Māori and Pacific Education, Te Kura Māori.

Sauvé, L. (1999). *Environmental Education Between Modernity and Postmodernity: Searching for an Integrating Educational Framework.* Canadian Journal of Environmental Education, Volume 4, Number 1, pp. 9-35. Retrieved on 18 September, 2013 from http://jee.lakeheadu.ca/index.php/cjee/article/viewFile/317/252

Saveland, R. N. (Ed.) (1976). *Handbook of Environmental Education: With International Case Studies.* England: John Wiley and Sons, Ltd..

Schlorff, S. (1993). *Muslim Ideology and Christian Apologetics.* Reproduced from Missiology, Volume 21, Number 2, April 1993, with the permission of the author. Retrieved on 29 April, 2012 from http://answering-islam.org/Christians/schlorff2.html

Schneider, S. H. (1997). *Defining and Teaching Environmental Literacy*. Trends in Ecology and Evolution, Volume 12, Issue 11, p. 457.

Scholz, R. W. (2011). *Environmental Literacy in Science and Society: From Knowledge to Decisions.* Cambridge University Press.

Scott G. B. (Ed.) (1984). *Environmental Education: A Source Book for Teachers.* Wellington: Commission for the Environment.

Scott, G. B. (1985). *Final Summary Report from the Environmental Education Research Contract*. Christchurch: Centre of Resource Management, University of Canterbury.

Scott, G. B. (1986). *School Based Environmental Education in New Zealand: Conceptual Issues and Political Implications, Volume One: Text.* Thesis, Ph.D., University of Canterbury, Christchurch, New Zealand.

Schneider, S. H. (1990). *Changing Climate and Problems of Prediction.* In Angell D.J.R, Comer J. D. & Wilkinson M. L. N. (Eds.) (1990), *Sustaining Earth: Response to the Environmental Threat.* London: Macmillan Academic and Professional Ltd..

Schneider, S. H. (1991). *Global Warming: Climate at Risk.* In Porritt, J. (1991) *Save the Earth.* London: Dorling Kindersley Limited.

Schraeder, M., Tears, R. S. & Jordan, M. H. (2005). *Organizational Culture in Public Sector Organizations. Promoting Change Through Training and Leading by Example.* Leadership and Organization Development Journal, Volume 26, issue 6, pp. 492-502.

Schwartz, P. & Randall, D. (2003). *An Abrupt Climate Change Scenario and its Implications for United States National Security*. Report: California institute of Technology, Pasadena, California, Jet Propulsion Lab. http://oai.dtic.mil/oai/oai?verb=getRecord&metadataPrefix=html&identifier=ADA469325

Schnotz, W., Vosnadou, S. & Carretero, M. (1999). *New Perspectives on Conceptual Change.* Oxford, United Kingdom: Elsevier Science.

Sedgwick, A. (1969). *A Discourse on the Studies of the University. Leicester.* Leicester University Press. General LB 2321 SE43

Selvi, M. (2004). *Environmental Education for Sustainable Development.* Fresenius Environmental Bulletin, Volume 13, Issue 9, 2004, pp. 900-902.

Sennett, R. (2002). *Respect: The Formation of Character in a World of Inequity.* London: Allen Lane.

Seuss, Dr. (1971). *The Lorax.* London: Collins.

Seymoar, N. K. (1992). *Results of Rio: An Emerging Social Movement.* PCD Forum Column Number 38, released July, 20, 1992. http://www.davidkorten.org/1992/38SEYMOA

Seymour, M. (Ed.) (2004). *Educating for Humanity: Rethinking the Purpose of Education.* Boulder, USA: Paradigm Publishers.

Sharp, B. (2011). *Debasing Science to Sell Stuff.* Marketing Science. http://byronsharp.wordpress.com/2011/11/12/debasing-science-all-in-the-name-of-a-good-cause/

Shaw, B. & Robichaux, J. H. (1980). *Council on Environmental Quality: Defining Human Environment.* California Western Law Relief. Volume 16, number 2, pp. 201-213.

Shepard, K. (2008). *Higher Education for Sustainability: Seeking Affective Learning Outcomes.* International Journal of Sustainability in Higher Education, Volume 9, Issue 1, pp. 87-98.

Shiva, V. (1988). *Staying Alive – Women, Ecology and Development.* London: Zed Books.

Shu-Yang, F., Freedman, B. & Cote, R. (2004). *Principles and Practice of Ecological Design.* Environmental Reviews, Volume 12, Issue 2, pp. 97-112.

Sibley, D. (1995). *Geographies of Exclusion: Society and Difference in the West.* London: Routledge.

Sidanius, J. & Pratto, F. (1999). *Social Dominance: An intergroup Theory of Social Hierarchy and Oppression.* United Kingdom: Cambridge University Press.

Simmons, I. G. (1991). *Earth, Air and Water: Resources and Environment in the Late 20th Century.* New York: Routledge, Chapman and Hall Incorporated.

Simmons, I. G. (2008). *Global Environmental History.* Chicago, United States of America: University of Chicago Press.

Simrall, D. (1947). *Intelligence and the Ability to Learn.* The Journal of Psychology: Interdisciplinary and Varied, Volume 23, Issue 1, pp. 27-43. Retrieved on 15 June 2011 from http://www.tandfonline.com/doi/abs/10.1080/00223980.1947.9917317

Singer, D. G., Golinkoff, R. M. & Hirsh-Pasek, K. (Eds.) (2006). *Play Equals Learning.* New York: Oxford University Press.

Slater Stern, B. & Kysilka, M. L. (Eds.) (2008). *Contemporary Readings in Curriculum.* Thousand Oaks, USA: Sage Publications, Inc..

Slavin, R. E. (2007). *Evidence-based Education Policies: Transforming Educational Practice and Research.* In Ornstein, A. C., Pajak, E. F. & Ornstein, S. B. (2007). *Contemporary Issues in Curriculum – Fourth Edition*, pp. 377-387. USA: Pearson Education, Inc..

Small, B. & Mallon, M. (2007). *Science, Society, Ethics and Trust: Scientists' Reflections on the Commercialization and Democratization of Science.* International Studies of Management and Organization, Volume 37, number 1, pp. 103-124.

Smit, B. & Wandel, J. (2006). *Adaptation, Adaptive Capacity and Vulnerability.* Global Environmental Change, Volume 16, pp. 282-289.

Smith, A. F. (2002). *How Global is the Curriculum?* In Slater Stern, B. & Kysilka, M. L. (Eds.) (2008), *Contemporary Readings in Curriculum.* Thousand Oaks, USA: Sage Publications, Inc..

Smith, C. A. & Jensen, M. R. (1936). *Educational, Psychological, and Physiological Factors in Reading Readiness.* The Elementary School Journal, The University of Chicago Press, United States of America, pp. 583-594.

Smith, G. A. & Williams, D. R. (Eds.) (1999), *Ecological Education in Action: on Weaving Education, Culture and the Environment*. State University of New York Press, New York, pp. 1-18.

Smith, G. A. (1999). *Creating a Public of Environmentalists: The Role of Nonformal Education.* In Smith, G. A. & Williams, D. R. (1999), *Ecological Education in Action: on Weaving Education, Culture and the Environment*. State University of New York Press, New York, pp. 207-228.

Smith, G. A. (2007). *Place-based Education: Breaking Through the Constraining Regularities of Public School.* Environmental Education Research, Volume 13, Issue 2, Special Issue: Revisiting Schooling and Environmental Education: Contradictions in Purpose and Practice, pp. 189-207. http://www.tandfonline.com/doi/abs/10.1080/13504620701285180

Smith, G. H. (1992). *Tane-Nui-A-Rangi's Legacy - Propping Up the Sky: Kaupapa Māori as Resistance and Intervention.* Research unit for Māori Education, Education Department, University of Auckland paper presented at NZARE/AARE Joint Conference, Deakin University, Australia, November 1992.

Smith, J. H. (2012). *The Politics of Reforming Māori Education: The Transforming Potential of Kura Kaupapa Māori.* In Lauder, H. & Wylie, C. (Eds.) (2012), *Towards Successful Schooling.* New York: Routledge, Volume 185, pp. 73-87.

Smith, T. W. (2013). *Public Attitudes Towards Climate Change & Other Environmental Issues across Time and Countries, 1993-2010.* International Social Survey Programme (ISSP) survey results presented 8 February 2013 at the Policy Workshop: Public Attitudes and Environmental Policy in Canada and Europe, Canada-European Transatlantic Dialogue, Carleton University, Ottawa, Canada. Retrieved on 28 February 2013 from http://canada-europe-dialogue.ca/wp-content/uploads/2013/02/Tom-Smith_Public-Attitudes-Towards-Environmental-Issues.pdf

Smith-Sebasto, N. J. & Walker, L. M. (2005). *Toward a Grounded Theory for Residential Environmental Education: A Case Study of the New Jersey School of Conservation.* The Journal of Environmental Education, Volume 37, Issue 1, pp. 27-42.

Smyth, J. (2008). *Environmental Education: a View of a Changing Scene.* In Reid, A. & Scott, W. (Eds.) (2008). *Researching Education and the Environment: Retrospect and Prospect.* Oxon: Routledge, pp. 1-18.

Spicer, A., Barthelmeh, M., Montgomery, R. & Spellerberg, I. (2011). *Education for Sustainability at Lincoln University, New Zealand.* Land, Environment and People (LEaP) Report Number 25, July 2011. Lincoln University, Canterbury New Zealand. Retrieved on 11 May 2013 from http://researcharchive.lincoln.ac.nz/dspace/bitstream/10182/3740/1/LEaP_rr_25.pdf

Splitt, F. G. (2004). *Engineering Education Reform: Signs of Progress.* International Journal of Engineering Education, Volume 20, Issue 6, pp. 1005-1011.

St Maurice, H. (2008). *Nature's Nature: Ideas of Nature in Curricula for Environmental Education.* In Reid, A. & Scott, W. (Eds.) (2008). *Researching Education and the Environment: Retrospect and Prospect.* Oxon: Routledge, pp. 55-62.

Stables, A. (2008). *Language and Meaning in Environmental Education: An Overview.* In Reid, A. & Scott, W. (Eds.) (2008). *Researching Education and the Environment: Retrospect and Prospect.* Oxon: Routledge, pp. 81-88.

Stables, A. & Bishop, K. (2001). *Weak and Strong Conceptions of Environmental Literacy: Implications for Environmental Education.* Environmental Education Research, Volume 7, Issue 1, pp. 89-97.

Stables, A. & Scott, W. (2002). *The Quest for Holism in Education for Sustainable Development.* Environmental Education Research, Volume 8, Issue 1, pp. 53-60.

Stapp, W. B., Bennett, D., Bryan, W. Jr., Fulton, J., MacGregor, J., Nowak, P., Swan, J., Wall, R. & Havlick, S. (1969). *The Concept of Environmental Education.* In C. Schoenfeld (Ed.) *Outlines of Environmental Education*, pp. 53-54. Madison: December Educational Research Services.

Stapp, W. B. (1997). *Epilogue for: "The Concept of Environmental Education"*. In *The Concept of Environmental Education.* Stapp, W. B., *et al*., (1969), The Journal of Environmental Education, Volume 1, Number 1, pp.30-31. Reprinted with permission of the Helen Dwight Reid Educational Foundation. Heldref Publications, Washington, DC. http://www.hiddencorner.us/html/PDFs/The_Concept_of_EE.pdf

Starks, H. & Trinidad, S. (2007). *Choose Your method: A Comparison of Phenomenology, Discourse Analysis, and Grounded Theory.* Qualitative Health Research, Volume 17, Number 10, pp. 1372-1380. DOI: 10.1177/1049732307307031

Steffen, W. L., Jäger, J., Matson, P., Moore III, B. Oldfield, F., Richardson, K., Sanderson, A., Schellnhuber, H. J., Turner, B. L. II & Wasson, R. J. (2005). *Global Change and the Earth System: A Planet Under Pressure.* New York: Springer.

Stenson, M. R. (Ed.) (1975). *New Zealand and the Global Ecological Crisis.* Wellington, New Zealand: Price Milburn and Company Limited, for the New Zealand Institute of Internal Affairs.

Sterling, S. (2001). *Sustainable Education: Re-Visioning Learning and Change.* Totnes: Green Books for the Schumacher Society.

Sterling, S. (2004). *An Analysis of the Development of Sustainability Education Internationally: Evolution, Interpretation and Transformative Potential.* In Blewitt, J. & Cullingford, C. (Eds.) (2004). *The Sustainability Curriculum: The Challenge for Higher Education.* London, UK: Earthscan, pp. 25-43.

Sterling, S. (2008). *Sustainable Education: Towards a Deep Learning Response to Unsustainability.* In Policy and Practice: A Development Education Review, Volume 6, Spring 2008, pp. 63-68. http://www.developmenteducationreview.com/issue6-perspectives1.

Stern, N. (2006a). *Stern Review of the Economics of Climate Change.* Independent Review, Her Majesty's Treasury, England. Retrieved on 19 February 2013 from http://webarchive.nationalarchives.gov.uk/+/http://www.hm-treasury.gov.uk/stern_review_report.htm.

Stern, N. (2006b). *Postscript, Stern Review of the Economics of Climate Change.* Independent Review, Her Majesty's Treasury, England. Retrieved on 19 February 2013 from http://www.hm-treasury.gov.uk/d/Postscript.pdf

Stern, N. (2008). *The Economics of Climate Change.* Richard T. Ely Lecture, American Economic Review: Papers and Proceedings 2008, Volume 98, Issue 2, pp. 1-37. Retrieved on 19 February 2013 from https://edit.ethz.ch/cepe/education/EnergyPolicy/Stern.pdf

Steup, M. (2011). "Epistemology", *The Stanford Encyclopaedia of Philosophy (Winter 2011 Edition)*, Edward N. Zalta (ed.), URL. Retrieved on 14 November 2012 from http://plato.stanford.edu/archives/win2011/entries/epistemology/

Stevens, G. R. & Stevens, D. L. (1980). *New Zealand Adrift: The Theory of Continental Drift in a New Zealand Setting.* Wellington, New Zealand: Reed Publishers Limited.

Stevenson, R. B. (1987). *Schooling and Environmental Education: Contradictions in Purpose and Practice.* In Robottom, I. (Ed.) (1987), *Environmental Education: Practice and Possibility.* Victoria, Australia: Deakin University, pp. 69-82.

Stevenson, R. (2007a). *Schooling and Environmental/Sustainability Education: Contradictions in Purpose and Practice.* Environmental Education Research, Volume 13, Issue 2, Special Issue: Revisiting Schooling and Environmental Education: Contradictions in Purpose and Practice, pp. 139-153.

Stevenson, R. (2007b). *Schooling and Environmental/Sustainability Education: From Discourses of Policy and Practice to Discourses of Professional Learning.* Environmental Education Research, Volume 13, Issue 2, Special Issue: Revisiting Schooling and Environmental Education: Contradictions in Purpose and Practice, pp. 265-285.

Stevenson, R. B. (2008). *Tensions and Transitions in Policy Discourse: Recontextualizing a Discontextualized EE/ESD Debate.* In Reid, A. & Scott, W. (Eds.) (2008). *Researching Education and the Environment: Retrospect and Prospect.* Oxon: Routledge, pp. 31-44.

Stevenson, R. B. & Evans, N. (2011). *The Distinctive Characteristics of Environmental Education Research in Australia: An Historical and Comparative Analysis.* Australian Journal of Environmental Education, Volume 27, Issue 1, 2011, pp. 24-45.

Strauss, A. & Corbin, J. (1990). *Basics of Qualitative Research: Grounded Theory Procedures and Techniques.* Newbury Park, CA: Sage.

Strauss, A. & Corbin, J. (1994). *Grounded Theory Methodology – An Overview.* In Denzin, N. K. & Lincoln, Y. S. (Eds.) (1994), *Handbook of Qualitative Research.* Thousand Oaks, CA: Sage Publications, pp. 273-285.

Strauss, A. & Corbin, J. (1998). *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory.* Thousand Oaks, CA: Sage Publications.

Stringfield, S. & Land, D. (Eds.) (2002). *Educating At Risk Students.* One Hundred-first Yearbook of the National Society for the Study of Education, Part II. 1040 W. Harrison St., Chicago, Illinois, United States of America.

Stronach, I. (2006). *Fashioning Post-modernism, Finishing Modernism: Tales From the Fitting Room.* British Educational Research Journal, Volume 22, Issue 3, 1996.

Suggate, S. P., Schaughency, E. A. & Reese, E. (2011). *The Contribution of Age and Reading to Oral Narrative and Pre-reading Skills.* First Language, Volume 31, issue 4, November 2011, pp. 379-403.

Suich, H., Child, B. & Spenceley, A. (2009). *Evolution and Innovation in Wildlife Conservation: Parks and Game Ranches to Transfrontier Conservation Areas*. UK: Earthscan.

Sullivan, A. (2001). *This IS Religious War.* New York Times Magazine. Retrieved on 7 July 2010 from http://www-personal.umich.edu/~elias/Courses/War/religiouswar.pdf

Sutton, D. G. (Ed.) (1994). *The Origins of the First New Zealanders*, p. 12. Auckland, New Zealand: Auckland University Press.

Suzuki, D. (2006). *David Suzuki: the Autobiography.* Vancouver, British Columbia, Canada: Greystone Books; A Division of Douglas & McIntyre Ltd..

Suzuki, D., McConnell, A. & Mason, A. (3rd Edition) (2007). *The Sacred Balance: Rediscovering Our Place in Nature.* First Published 1997. Vancouver, British Columbia, Canada: Greystone Books; A Division of Douglas & McIntyre Ltd..

Tanner, T. (1980). *Significant Life Experiences: A New Research Area in Environmental Education.* Journal of Environmental Education, Volume 11, Number 4, pp. 20-24.

Taşar, M. F. (2009). *Challenges in Environmental Education: A Conversation with Annette Gough.* Eurasia Journal of Mathematics, Science and Technology Education, Volume 5, Issue 3, pp. 187-196.

Taylor, P. W. (1986). *Respect for Nature.* In Armstrong, S. J. & Botzler, R. G. (1993), *Environmental Ethics: Divergence and Confluence*, pp. 382-386. New York: McGraw-Hill, Inc..

Te Aonohoriu Haig, I. (1997). *Titiro, Moko! Whakarongo, Moko! Speaking with Aunty Ada.* In Te Whāiti, P., McCarthy, M. & Durie, M. (Eds.) (1997). *Mai I Rangiātea; Māori Well-being and Development.* Auckland: Auckland University Press, pp. 39-45.

Teksoz, G., Sahin, E. & Ertepinar, H. (2010). *A New Vision for Chemistry Education Students: Environmental Education.* International journal of Environmental and Science Education, Volume 5, Issue 2, pp. 131-149.

Te Puni Kōkiri – Ministry of Māori Development (1993). *The Benefits of Kura Kaupapa Māori.* Wellington, New Zealand: Te Puni Kōkiri – Ministry of Māori Development.

Te Puni Kōkiri – Ministry of Māori Development (1994). *Mana Tāngata: Draft Declaration on the Rights of Indigenous Peoples 1993: Background and Discussion on Key Issues*. Wellington, New Zealand: Te Puni Kōkiri – Ministry of Māori Development.

Te Whāiti, P., McCarthy, M. & Durie, M. (Eds.) (1997). *Mai I Rangiātea; Māori Well-being and Development.* Auckland, New Zealand: Auckland University Press.

The Royal Forest and Bird Protection Society Inc. *Our Fragile Paradise: An Activity-based Secondary School Resource Kit (video and booklet)*. Wellington, New Zealand: The Royal Forest and Bird Protection Society Inc., 1994.

Theobald, P. & Rochon, R. (2011). "Environmental Education." *Encyclopaedia of Environmental Ethics and Philosophy*. Ed. J. Callicott and Robert Frodeman. Volume 1, pp. 329-332. Detroit: Macmillan Reference USA, 2009. *Global Reference on the Environment, Energy, and Natural Resources*. Web. 29 November, 2011.

Thomas, A., Cairney, S., Gunthorpe, W., Paradies, Y. & Sayers, S. (2010). *Strong Souls: Development and Validation of a Culturally Appropriate Tool for Assessment of Social and Emotional Well-being in Indigenous Youth.* Australian and New Zealand Journal of Psychiatry, Volume 44, Issue 1, pp. 40-48.

Thompson, D. (Ed.) (1996). *The Pocket Oxford Dictionary of Current English. Revised Eighth Edition*. New York: Clarendon Press, Oxford University Press Inc..

Tilbury, D. (1995). *Environmental Education for Sustainability: Defining the New Focus of Environmental Education in the 1990's.* Environmental Education Research, Volume 1, Issue 2, pp.195-212.

Tilbury, D. (1996). *Environmentally Educating Teachers: The Priority of Priorities.* Connect, Volume 15, Issue 1.

Tilbury, D. (2004). *Rising to the Challenge: Education for Sustainability in Australia*. Australian Journal of Environmental Education, Volume 20, Issue 2, pp. 103-114.

Tilbury, D. (2006). *Australia's Response to a UN Decade in Education for Sustainable Development.* Australian Journal of Environmental Education, Volume 22, Issue 1, pp. 77-81.

Tilbury, D. & Walford, R. (1996). *Grounded Theory: Defying the Dominant Paradigm in Environmental Education Research.* In Williams, M. (Ed.) (1996), *Understanding Geographic and Environmental Education: The Role of Research,* London: Cassels, pp. 51-64.

Tilbury, D. & Wortman. D. (2005). *Whole School Approaches to Sustainability.* Geographical Education, Volume 18, pp. 22-30.

Timpson, W. M., Dunbar, B., Kimmel, G., Bruyere, B., Newman, P. & Mizia, H. (2006). *147 Practical Tips for Teaching Sustainability: Connecting the Environment, the Economy, and Society.* Madison, Wisconsin: Atwood Publishing.

Tiramōrehu, M., van Ballekom, M. & Harlow, R. (1987). *Te Waiatatanga mai o te Atua : South Island traditions.* Recorded by Matiaha Tiramōrehu ; edited by Manu van Ballekom and Ray Harlow. Christchurch, New Zealand: Department of Māori, University of Canterbury.

Tomasi, J. (2002). *Civic Education and Ethical Subservience: From Mozart to Santa Fe and Beyond.* In Macedo, S. & Tamir, Y. (Eds.) (2002), *Moral and Political Education, Nomos XLIII.* New York, United States of America: New York University Press.

Tonn, B. E. (2000). *Environmental Review: Environmental Decision Making in the Face of Uncertainty.* Environmental Practice, Volume 2, Issue 2, pp. 188-202.

Townsend, M. & Harris, P. (2004). *Now the Pentagon Tells Bush: Climate Change Will Destroy Us: Secret Report of Rioting and Nuclear War; Threat to the World is Greater than Terrorism.* The Observer UK, Sunday, February 22, 2004, in Common Dreams NewsCenter, Tuesday, February 24, 2004. http://www.climate-talks.net/2004-ENVRE130/PDF/20040222-Common-Dreams-Observer.pdf

Travers, W. T. L. (1881). Article IV - Notes upon the Great Floods of New Zealand, February, 1868. In *Transactions and Proceedings of the New Zealand Institute 1881, Volume XIV*, edited and published under the authority of the Board of Governors of the Institute by James Hector, C.M.G., M.D., F.R.S.. Issued May 1882. Lyon & Blair, Wellington, New Zealand.

Tuan, Yi-Fu (1998). *Escapism.* Baltimore: The Johns Hopkins University Press.

Tuncer, G., Tekkaya, C., Sungur, S., Cakiroglu, J. Ertepinar, H. & Kaplowitz, M. (2009). *Assessing Pre-Service Teachers' Environmental Literacy in Turkey as Mean to Develop Teacher Education Programs.* International Journal of Educational Development, Volume 29, Issue 4, pp. 426-436.

Turner, N. J. (2005). *The Earth's Blanket: Traditional Teachings for Sustainable Living.* Seattle: University of Washington Press.

Uhl, C. & Stuchul, D. L. (2011). *Teaching as if Life Matters: The Promise of a New Education Culture.* Baltimore, Maryland, USA: The John Hopkins University Press.

Ulluwishewa, R., Kaloko, A. & Morican, D. (1997). *Indigenous Knowledge and Environmental Education.* Paper presented at Environmental Education Workshop, University of Brunei, Darassulam.

United Nations (UN) (1992). *Recasting Education for Sustainable Development*. Toronto: World Congress on Environmental and Development Education and Communication, ECO-ED.

United Nations (UN) (1994a). *United Nations International Conference on Population and Development (ICPD).* United Nations, Cairo, Egypt, 5-13 September, 1994. Linkages. http://www.iisd.ca/cairo.html

United Nations (UN) (1994b). *Programme of Action of the United Nations International Conference on Population and Development (ICPD).* United Nations, Cairo, Egypt, 5-13 September, 1994. Linkages. http://www.iisd.ca/Cairo/program/p00000.htm

United Nations (UN) (1995). *Population Information, Education and Communication*. Report of the International Conference on Population and Development.

United Nations (UN) (1997). *Review and Assessment of the Implementation of Agenda 21*. United Nations General Assembly. 19th Extraordinary Session, June 23-28, 1997.

United Nations (UN) Millennium Ecosystem Assessment Board (MEA) (2005). *Living Beyond Our Means – Natural Assets and Human Well Being (Statement from the Board)*. Retrieved on 13 June 2011 from http://pdf.wri.org/ma_board_final_statement.pdf

United Nations Centre for Environment and Development (UNCED) (1992a). *Agenda 21: The United Nations Programme for Action from Rio.* New York: United Nations.

United Nations Centre for Environment and Development (UNCED) (1992b). *Rio Declaration of Environment and Development.* Annex I of the Report of the United Nations Conference on Environment and Development. United Nations. Retrieved on 5 June 2010 from http://www.un.org/documents/ga/conf151/aconf15126-1annex1.htm

United Nations Centre for Environment and Development (UNCED) (1992c). *United Nations Conference on Environment and Development: Outcomes of the Conference.* Wellington: Ministry for External Relations and Trade, and Ministry for the Environment.

United Nations Environment Programme (UNEP) (1972a). *Declaration of the United Nations on the Human Environment.* Retrieved 08 May, 2011 from http://www.unep.org/Documents.Multilingual/Default.asp?documentid=97&articleid=1503

United Nations Environment Programme (UNEP) (1972b). *Report of the United Nations Conference on The Human Environment.* Retrieved 08 May, 2011 from http://www.unep.org/Documents.Multilingual/Default.asp?documentid=97

United Nations Environment Programme (UNEP) (1987). *International Action Strategy for Environmental Education and Training for the 1990s*. Moscow.

United Nations Environment Programme (UNEP) (2012). *Report of the United Nations Environment Programme, Submitted to the 11th Session of the United Nations Permanent Forum on Indigenous Issues.* United Nations, New York. Retrieved on 12 January, 2013 from http://www.un.org/esa/socdev/unpfii/documents/2012/session-11-UNEP.pdf

United Nations Educational, Scientific, and Cultural Organisation (UNESCO) (1972). *Compulsory Education in New Zealand: A Study Initiated by the National Commission for UNESCO, Second Revised Edition.*

United Nations Educational, Scientific, and Cultural Organisation (UNESCO). Studies on Compulsory Education. United Nations Educational, Scientific and Cultural Organization, Paris, France.

United Nations Educational, Scientific, and Cultural Organisation (UNESCO) (1978). *Final Report: First Intergovernmental Conference on Environmental Education*. United Nations Education, Scientific, and Cultural Organisation, Paris: 1978.

United Nations Educational, Scientific, and Cultural Organisation (UNESCO) (1989). *International Symposium and Round Table.* Final Report. UNESCO Publishing, Paris.

United Nations Educational, Scientific, and Cultural Organisation (UNESCO) (1993). *Overcoming the Barriers to the Successful Implementation of Environmental Education through Teacher Education*. United Nations Educational, Scientific and Cultural Organization, Asia-Pacific Regional International Experts Meeting. Brisbane: Griffith University.

United Nations Educational, Scientific, and Cultural Organisation (UNESCO) (1995). *Interregional Workshop on Re-orienting Environmental Education for Sustainable Development*. Athens: UNESCO.

United Nations Educational, Scientific, and Cultural Organisation (UNESCO) (1996). *Learning: The Treasures Within* (Delors Report). Report of the International Commission on Education for the 21st Century. UNESCO Publishing, Paris.

United Nations Educational, Scientific, and Cultural Organisation (UNESCO) (1997). *Educating for a Sustainable Future: A Transdisciplinary Vision for Concerted Action.* United Nations Educational, Scientific and Cultural Organization. EPD-97/CONF.401/CLD. Paris: UNESCO.

United Nations Educational, Scientific, and Cultural Organisation (UNESCO) (1998). *World Education Report: Teachers and Teaching in a Changing World.* United Nations Educational, Scientific and Cultural Organization (UNESCO) Publishing, Paris.

United Nations Educational, Scientific, and Cultural Organisation (UNESCO) (2000). *World Education Report – The Right to Education: Towards Education for All Throughout Life.* UNESCO Publishing, Paris.

United Nations Educational, Scientific, and Cultural Organisation (UNESCO) (2002). *Education for Sustainability – From Rio to Johannesburg: Lessons Learned from a Decade of Commitment.* Paris: UNESCO.

United Nations Educational, Scientific, and Cultural Organisation (UNESCO) (2005). *United Nations Decade of Education for Sustainable Development: International Implementation Scheme.* Paris: UNESCO. Retrieved on 12 April, 2012 from unesdoc.unesco.org/images/0014/001486/148654e.pdf

United Nations Educational, Scientific, and Cultural Organisation (UNESCO) (2008). *Reinventing Higher Education: Toward Participatory and Sustainable Development.* Bangkok: UNESCO. Retrieved on 6 April 2012 from http://unesdoc.unesco.org/images/0016/001631/163155e.pdf

United Nations Educational, Scientific, and Cultural Organisation (UNESCO) (2009). *Proceedings, UNESCO World Conference on Education for Sustainable Development.* Paris: UNESCO.

United Nations Educational, Scientific, and Cultural Organisation (UNESCO) (2011). *Education for Sustainable Development Country Guidelines for Changing Climate of Teacher Education to Address Sustainability: Putting Transformative Education into Practice.* Jakarta: UNESCO. Retrieved on 16 May 2012 from http://unesdoc.unesco.org/images/0021/002152/215280e.pdf

UNESCO-EPD (1997a). *Educating for a viable future: An interdisciplinary view for concerted action*. International conference. Environment and Society: Education and Public Awareness for Viability. Thessaloniki, December 8 to 12, 1997.

UNESCO- EPD (1997b). *Declaration of Thessaloniki*. International Conference, Environment and Society: Education and Public Awareness for Viability. Thessaloniki, December 8 to 12, 1997. http://unesdoc.unesco.org/images/0011/001177/117772eo.pdf

UNESCO-UNEP (1976). *The Belgrade Charter*. Adopted by the UNESCO-UNEP international Workshop on Environmental Education at Belgrade, 13-22 October, 1975. http://unesdoc.unesco.org/images/0001/000177/017772eb.pdf.

UNESCO–UNEP (1978). Final Report, Intergovernmental Conference on Environmental Education, Tbilisi, USSR, 14-26 October 1977. UNESCO, Paris. http://unesdoc.unesco.org/images/0003/000327/032763eo.pdf.

UNESCO-UNEP (1988). *International Strategy for Action in the Field of Environmental Education and Training for the 1990s.* Moscow, Paris and Nairobi: Congress on Environmental Education and Training.

UNESCO-UNEP (1994). *Population: Working for an Equitable, Sustainable Development in Harmony with the Environment.* Connect: UNESCO-UNEP Environmental Education Bulletin, Volume XIX, Number 4, December, pp. 1-3. http://unesdoc.unesco.org/images/0015/001535/153531eo.pdf

UNESCO-UNEP (1996). *Education for Sustainable Development. A Priority for the World Community.* Connect: UNESCO-UNEP Environmental Education Bulletin, Volume XXI, Number 2, June. http://unesdoc.unesco.org/images/0015/001534/153482eo.pdf

UNESCO-UNEP, IEEP (International Environmental Education Programme) & MIO/ECSDE (Mediterranean Information for

Environment, Culture and Sustainable Development) (1995). *Re-orienting Environmental Education for Sustainable Development*. Inter-regional Workshop, Final Report. Athens, June 26-30, 1995. http://unesdoc.unesco.org/images/0013/001387/138758eb.pdf

UN FAO (2005). UN FAO Committee on World Food Security, May 2005. www.fao.org/docrep/meeting/009/J4968e/j4968e00.htm

UNFCCC (1997). *Kyoto Protocol.* United Nations Framework Convention on Climate Change. http://unfccc.int/kyoto_protocol/items/2830.php

University of Otago Ethics Committee (2011). *Filling Out your Human Ethics Application: Please Consult These Specific Notes. http://www.otago.ac.nz/administration/committees/otago0154921.pdf*

Upton, S. (1997). *Vivid Insight into the Dangers facing the New Zealand Environment.* The Christchurch Press, Monday, October 6, p. 11.

Vaillancourt, J. G. (1992). In Sauvé, L. (1999). *Environmental Education Between Modernity and Postmodernity: Searching for an Integrating Educational Framework.* Canadian Journal of Environmental Education, Volume 4, Number 1, pp. 9-35. Retrieved on 18 September, 2013 from http://jee.lakeheadu.ca/index.php/cjee/article/viewFile/317/252

Valentine, I., Hurley, E, Reid, J. & Allen, W. (2007). *Principles and Processes for Effecting Change in Environmental Management in New Zealand.* Journal of Environmental Management, Volume 82, Issue 3, pp. 311-318.

VanBreda, A. DuPlessis (2001). *Resilience Theory: A Literature Review, With Special Chapters on Deployment Resilience in Military Families.* Report MPI/R/104/12/1/4, October, 2001. South African Military Health Service, Military Psychological Institute, Social Work Research and Development. Pretoria, South Africa. http://vanbreda.org/adrian/resilience/resilience_theory_review.pdf

Van Eijck, M. & Roth, W. M. (2009). *Towards Epistemologically Sound Approaches in Environmental Education.* In Zandvliet, D. B. (Ed.) (2009), *Diversity in Environmental Education Research.* Rotterdam, The Netherlands: Sense Publishers, pp. 9-24.

Van Matre, S. (1984). *Environmental Education: Mission Gone Astray.* Excerpts from a Speech, Institute of Earth Education. Greenville: Cedar Grove.

Van Matre, S. (N.D.). Cited in M. Weilbacher (1991), *Education That Cannot Wait*. In Fairman, K., Barrett, Y., Bones, D., & Goodwin, J. (Eds.) (N.D.). EE Reference Collection: Selected Articles on Environmental Education: Traditional Perspectives, New Ideas, Differences of Opinion, pp. 8-10. Michigan: University of Michigan, School of Natural Resources and Environment.

Van Olphen, M., Rios, F., Berude, W., Dexter, R. & McCarthy, R. (2006). *The Plains City Story.* In Slater Stern, B. & Kysilka, M. L. (Eds.) (2008), *Contemporary Readings in Curriculum.* Sage Publications, Inc., Thousand Oaks, California, United States of America.

van Wyhe, J. (2010) *Evolution, Progress and Natural Laws*, http://www.victorianweb.org/science/evolution.html

Verhagen, T., Feldberg, F., Van Den Hooff, B., Meents, S. & Merikivi, J. (2012). *Understanding Users' Motivations to Engage in Virtual Worlds: A Multipurpose Model and Empirical Testing.* Computers in Human Behaviour, Volume 28, Issue 2, pp. 484-495.

Vitousek, P. M., Mooney, H. A., Lubchenco, J. & Melillo, J. M. (1997). *Human Domination of Earth's Ecosystems.* Science, Volume 277, Number 5325, pp. 494-499.

Vosniadou, S. (2001). *How Children Learn.* International Academy of Education, International Series, Number 7. http://www.ibe.unesco.org/publications/EducationalPracticesSeriesPdf/prac07e.pdf

Wahl, D. C. (2007). *Scale-linking Design for Systemic Health: Sustainable Communities and Cities in Context.* International Journal of Ecodynamics, Volume 2, Issue 1, pp. 57-72.

Walach, H. & Reich, K. H. (2005). *Reconnecting Science and Spirituality: Toward Overcoming a Taboo.* Zygon, Volume 40, Issue 2, June 2005, pp.423-442.

Walker, B. Holling, C. S., Carpenter, S. R. & Kinzig, A. (2004). *Resilience, Adaptability and Transformability in Social-Ecological Systems.* Ecology and Society, Volume 9, Issue 2, 2004, Article Number 5.

Walker Painemilla, K., Rylands, A. B., Woofter, A. & Hughes, C. (Eds.) (2010). *Indigenous Peoples and Conservation: From Rights to Resource Management.* USA: Conservation International.

Wallace, A .R.(1875). *Contributions to the Theory of Natural Selection.* London: Macmillan. Leith Storage QH 366 W5391

Wallace, A. R.(1869). *The Malay Archipelago. Vol. I.* London: Macmillan. Special Collections DS 601 W541

Walsh, M. (1991). *Air Pollution: Living Dangerously.* In Porrit, J. (1991) *Save the Earth.* London: Dorling Kindersley Limited.

Walsh, P. (1993). *Education and Meaning: Philosophy in Practice*. London: Cassell Educational.

Ward, B. & Dubos, R. (1972). *Only One Earth: The Care and Maintenance of a Small Planet.* An unofficial report commissioned by the Secretary-General of the United Nations Conference on the Human Environment, prepared with the assistance of a 152-member Committee of Corresponding Consultants in 58 countries. London: André Deutsch Limited.

Ward, C. (1999). *Teaching to Learn: Your Guide to Success in the Classroom.* Accelerated Learning Institute (New Zealand) Limited. Christchurch, New Zealand: Microfilm and Copy Centre Ltd.

Ward, E. R. (2001). *Geo-environmental Disconnection and the Colorado River Delta: Technology, Culture, and the Political Ecology Paradise.* Environment and History, Volume 7, Issue 2, pp. 219-246.

WCED (World Commission on Environment and Development) (1987). *Our Common Future.* Oxford University Press.

Webster's New Twentieth Century Dictionary, 2nd Edition

Weilbacher, M. (1991). *Education That Cannot Wait*. In Fairman, K., Barrett, Y., Bones, D., & Goodwin, J. (Eds.) EE Reference Collection: Selected Articles on Environmental Education: Traditional Perspectives, New Ideas, Differences of Opinion, pp. 8-10. Michigan: University of Michigan, School of Natural Resources and Environment.

Whangaparita, L., Awatere & S., Nikora, L. (2003). *Māori Perspectives of The Environment: A Review of Environment Waikato Iwi Environmental Management Plans.* Technical Report Number 2 prepared by the Māori and Psychology Research unit of the University of Waikato and Manaaki Whenua Landcare Research for the Environment Waikato Community & Economy Programme, Hamilton, New Zealand.

White, L. (Jr) (1967). The Historical Roots of Our Ecological Crisis. Science, Volume 155, Issue 3767, pp. 1203-1207.

Wiersma, E. (2007). *Conditions that Shape the Learning Curve: Factors that Increase the Ability and Opportunity to Learn.* Management Science, Volume 53, number 12, pp. 1903-1915. Retrieved on 22 March 2011 from http://mansci.journal.informs.org/content/53/12/1903.short

Wilberforce, S. (1869). *Vanity Fair, 24 July 1869.* Heritage Collection, Dunedin Public Library.

Wilberforce, S. (1860.) *Review of Origin of Species in Quarterly Review, July.* Special Collections, University of Canterbury.

Willgoose, C. E. (1981). *Environmental Health Education for Survival.* Health Education, Volume 12, Issue 3, pp. 33-35.

Williams H. W. (2008). *A Dictionary of the Māori Language.* Seventh edition, revised and augmented by the Advisory Committee on the teaching of the Māori Language, Department of Education. Legislation Direct. Reprinted 2008 by SecuraCopy, Wellington, New Zealand.

Williams, J. (2003). *Papa-tua-nuku: Attitudes to Land*. In Ka'ai, T., Moorfield, J.C., Reilly, M. & Mosely, S. (Eds), *Ki Te Whaiao: An Introduction to Māori Culture and Society.* Auckland, New Zealand: Pearson Education.

Williams, J. (2004). *'E Pākihi Hakinga a Kai: An Examination of Pre-contact Resource Management Practice in Southern Te Wāi Pounamu.* A Thesis Submitted for the Degree of Doctor of Philosophy of the University of Otago (Te Whare Wānanga o Otāgo), Dunedin, New Zealand.

Williams, J. (2006). *Resource Management and Māori Attitudes to Water in Southern New Zealand*. New Zealand Geographer, Volume 62, pp. 73-80.

Williams, J. (2011). *Toitu te Marae a Tāne: Some Ngāi tahu Experience.* Unpublished book chapter in possession of the author.

Williams, P. M. (2008). *University Leadership for Sustainability: An Active Dendritic Framework for Enabling Connection and Collaboration.* A Thesis submitted to the Victoria University of Wellington in fulfilment of the requirements for the degree of Doctor of Philosophy in Environmental Studies.

Williams, P. (2012). *Educating for Sustainability in New Zealand: Success Through Enviroschools.* Schooling for Sustainable Development, 2012, Volume 3, pp. 33-48. DOI: 10.1007/978-94-007-2882-0_3. Retrieved 25 April, 2012 from http://www.springerlink.com/content/h22375vru10j0428/.

Wilson-Hill, F. (2003). *Children's Particpation in Environmental Education – an Analysis of Enviroschools as a Whole School Approach to Environmental Education.* Unpublished Masters Thesis, Griffith University, Brisbane, Australia.

Wilson-Hill, F. (2010). *Better Understanding Educational Outcomes Connected to the New Zealand Curriculum in Enviroschools.* Report for the Enviroschools Foundation. Hamilton: Enviroschools Foundation. Retrieved on 27 June, 2012 from http://www.enviroschools.org.nz/about-enviroschools/national-projects/research

Winn, M. (1977). *The Plug-in Drug.* New York: Viking Press.

Winn, M. (1988). *Unplugging the Plug-in Drug.* Drawings by Karla Kuskin. New York: Penguin Books.

Woodrow, H. (1946). *The Ability to Learn.* Psychological Review, Volume 53, Issue 6, pp. 147-158.

World Commission on Environment and Development (1987). *Our Common Future*. New York: Oxford University Press.

World Health Organisation (1986). *The Ottawa Charter for Health Promotion*. Ottawa: World Health Organisation.

World NGO Forum (1992), *Treaty: Environmental Education for Sustainable Societies and Global Responsibility*. Global Conference on Environmental Education, Rio de Janeiro, October.

World Resources Institute (WRI), International Union for Conservation of Nature and Natural Resources (IUCN), United Nations Environment Programme (UNEP), Food and Agriculture Organisation of the United Nations (FAO), and the United Nations Education, Scientific, and Cultural Organisation (UNESCO) (1992). *Global Biodiversity Strategy: Guidelines for Action to Save, Study, and Use Earth's Biotic Wealth Sustainably and Equitably*. Washington: World Resources Institute.

World Summit on Sustainable Development (2002). *A Framework for Action on Agriculture.* Water Environment Health Agriculture Biodiversity (WEHAB) Working Group, August 2002, Johannesburg, South Africa. Retrieved on 14 May 2011 from http://www.johannesburgsummit.org/html/documents/summit_docs/wehab_papers/wehab_agriculture.pdf

World Summit on Sustainable Development (2002). *A Framework for Action on Energy.* Water Environment Health Agriculture Biodiversity (WEHAB) Working Group, August 2002, Johannesburg, South Africa. Retrieved on 14 May 2011 from http://www.johannesburgsummit.org/html/documents/summit_docs/wehab_papers/wehab_energy.pdf

World Summit on Sustainable Development (2002). *A Framework for Action on Health and Environment.* Water Environment Health Agriculture Biodiversity (WEHAB) Working Group, August 2002, Johannesburg, South Africa. Retrieved on 14 May 2011 from http://www.johannesburgsummit.org/html/documents/summit_docs/wehab_papers/wehab_health.pdf

World Summit on Sustainable Development (2002). *A Framework for Action on Sanitation.* Water Environment Health Agriculture Biodiversity (WEHAB) Working Group, August 2002, Johannesburg, South Africa. Retrieved on 14 May 2011 from http://www.johannesburgsummit.org/html/documents/summit_docs/wehab_papers/wehab_water_sanitation.pdf

World Summit on Sustainable Development (2002). *A Framework for Action on Biodiversity and Ecosystem Management.* Water Environment Health Agriculture Biodiversity (WEHAB) Working Group, August 2002, Johannesburg, South Africa. Retrieved on 14 May 2011 from http://www.johannesburgsummit.org/html/documents/summit_docs/wehab_papers/wehab_biodiversity.pdf

WWF-New Zealand (World Wildlife Fund New Zealand) (2008). *Teachers Need More Support for Environmental Education.* Retrieved on 21 November 2011 from WWF-New Zealand http://www.wwf.org.nz/media_centre/?1231

Wynn, G. (1977). *Conservation and Society in Late Nineteenth-Century New Zealand*. New Zealand Journal of History, Volume 11, Issue 2, pp. 124-136.

Xu, Z., Turei, O. & Yuan, Y. (2012). *Online game Addiction Among Adolescents: Motivation and Prevention Factors.* European Journal of information Services, Volume 21, Issue 3, pp. 321-340.

Yeo, R. K. (2006). *Developing Tomorrow's Leaders: Why Their Worldviews of Today Matter?.* Industrial and Commercial Training, Volume 38, Issue 2, pp. 63 – 69.

Zachariou, A. & Symeou, L. (2008). *The Local Community as a Means for Promoting Education for Sustainable Development*. Applied Environmental Education and Communication, Volume 7, Issue 4, pp. 129-143.

Zandvliet, D. B. (Ed.) (2009). *Diversity in Environmental Education Research.* Rotterdam, The Netherlands: Sense Publishers.

Zimmerman, M. E. (1985). *The Critique of Natural Rights and the Search for a Non-Anthropocentric Basis for Moral Behaviour.* The Journal of Value Inquiry, Volume 19, Issue 1, March 1985, pp. 43-53.

Zuzanek, J., Beckers, T. & Peters, P. (1998). *The 'Harried Leisure Class' Revisited: Dutch and Canadian Trends in the Use of Time from the 1970s to the 1990s.* Leisure Studies, Volume 17, Issue 1, pp. 1-19.

WEBSITES:

http://chemtrailsnorthnz.wordpress.com/2011/01/06/humans-have-intentionally-modified-weather-for-military-purposes-and-climate-control-for-decades/

http://sci.waikato.ac.nz/evolution/DevelopmentEvolThought.shtml

http://www.regjeringen.no/upload/SMK/Vedlegg/Taler%20og%20artikler%20av%20tidligere%20statsministre/Gro%20Harlem%20Brundtland/1987/Presentation_of_Our_Common_Future_to_UNEP.pdf

http://www.waldorfanswers.com/WaldorfFAQ.htm#9

http://www.google.co.nz/search?client=safari&rls=en&q=Rudolph+Steiner+introduction+of+reading+tuition&ie=UTF-8&oe=UTF-8&redir_esc=&ei=j8WGTYb2MMf0cIiTiaMD

www.hinduwebsite.com/hinduism/h_islam.asp

www.learninglive.co.uk/**teach**ers/re/syllabus/Syllabus.pdf

http://www.review.mai.ac.nz/index.php/MR/article/viewFile/212/227 - ENVIROSCHOOLS

http://www.mfe.govt.nz/issues/sustainable-industry/tools-services/concepts.php?id=13

LIST OF ORAL INFORMANTS:

Oral Informant	Authority
Abraham Witana	Ngāti Manawa, Te Rarawa; Programme Manager, Māori Policy Specialist, Tāngata Whenua, Northland Regional Council
Dr. Hauiti Hakopa	Ngāti Tuwharetoa; Teaching Fellow, Information Technology and Services, University of Otago
Dr Jim Williams	Kāi Tahu; Pūkenga Matua, Senior Lecturer, Te Tumu, School of Māori, Pacific and Indigenous Studies, University of Otago
Dr. Pat Devlin	Reader (Emeritus), Lincoln University
Whaea Emma Gibbs-Smith	
Joe Harawira	Ngāti Awa; Te Pou Tiriao o Papatuanuku, Project Co-ordinator Sawmill Workers Against Poisons
Matua Hori Parata	Ngāti Wai
Boua Huata Holmes	Waitaha

APPENDICES

APPENDIX A – Application for Ethics Approval

Application to the University of Otago HUMAN Ethics Committee for Ethical Approval of a Research or Teaching Proposal involving Human Participants

PLEASE *read carefully the important notes on the last page of this form. Provide a response to each question; failure to do so may delay the consideration of your application.*

1. University of Otago staff member responsible for project:

Primary Supervisor: Campbell Hugh Professor

Chair in Sociology and Head of Department, Department of Sociology, Gender and Social Work.

Senior Researcher - Centre for the Study of Agriculture, Food and Environment

Secondary Supervisor: Williams Jim Doctor

Pūkenga Matua/Senior Lecturer,Te Tumu – School of Maori, Pacific and Indigenous Studies

2. Department: Centre for Study of Agriculture, Food and Environment

3. Contact details of staff member responsible:

PH: +64-3-4798749 EMAIL: hugh.campbell@otago.ac.nz

University of Otago,

PO Box 56,

Dunedin

4. Title of project:

Education for Survival and Sustainability: Indigeneity and Mātauranga Māori.

5. Brief description in lay terms of the purpose of the project:

This project will investigate Maori educators' perceptions, understandings and practices of 'environmental education' or 'education for sustainability' to identify robust cultural perspectives, understandings, attitudes, learning 'tools' and practices, for inclusion and integration in education and resource management policy and practice in New Zealand.

Indicate type of project and names of other investigators and students:

Student Research Names

7. Is this a repeated class teaching activity?

No

If applying to continue a previously approved repeated class teaching activity, please provide Reference Number:

N/A

8. Intended start date of project:

1 March 2011

Projected end date of project:

30 April 2012

9. Funding of project.

Is the project to be funded:

a. (a) Internally

b. (b) **Externally**

University of Otago PhD Scholarship

10. Aim and description of project:

10.1 Aim:

It is contended by some scholars and educators that Matāuranga Māori and Traditional Māori worldviews, based upon the inter-relatedness and inter-connectedness of all that is living and non-living, might engender the sensitivities, awareness, knowledge, understandings, attitudes, values, ethics and skills essential for fostering an ecologically literate society capable of achieving ecological sustainability and survival. This thesis seeks to examine and describe how 'environmental education' or 'education for sustainability' is conceptualised, understood and practiced amongst New Zealand Māori so as to inform and facilitate meaningful integration of Māori understandings in environmental education (education for sustainability) policy and practices in New Zealand towards achieving lifestyles and practices that are truly ecologically sustainable.

10.2 Academic Contribution

This thesis will contribute to the growing body of academic literature, knowledge and understanding of the need for a new paradigm for learning and interacting with the environment as a matter of human survival and sustainability.

By understanding what is considered to be, or what is needed as, 'environmental education' or 'education for sustainability' and how it is thought about (conceptualised), how it is or would be practiced and why, within and in context with Māori cultural perspectives, such perspectives and any 'tools' may then be appropriately represented as a cohesive validated approach or pedagogy, and integrated in environmental education policy and practices.

It is hoped that this study will help facilitate meaningful integration of Māori understandings in environmental education (education for sustainability) policy and practices in New Zealand.

The literature suggests that by understanding and incorporating such indigenous understandings, we stand some hope of achieving better collective understanding and respect of the New Zealand environment amongst New Zealanders, along with improving understanding of what is needed to achieve lifestyles and practices that are truly ecologically sustainable.

Further, such perspectives, 'tools' and practices may then be integrated in resource planning and management towards achieving ecologically sustainable resource management practices and a sustainable future. This study may establish a set of tools or at least a template for use in education, planning and management for sustainability within New Zealand and internationally.

11. Researcher or instructor experience and qualifications in this research area:

11.1 Primary Supervisor

Professor Hugh Campbell provides leadership in the technical and sociological aspects of this study. He is newly appointed Chair in Sociology and Head of Department, Department of Sociology, Gender and Social Work, succeeding his Directorship of the Centre for Study of Agriculture, Food and Environment, where he was appointed Foundation Director in 2001. He has been an Associate Professor of Social Anthropology at the University of Otago, holding a position in the Dept of Anthropology since 1994. In 1995, he became the

Programme Leader of a series of research grants studying the emergence of commercial forms of 'sustainable' agriculture: including organic and Integrated Management systems. After 2000, Hugh has undertaken research programmes into the potential impacts of agricultural biotechnologies. All these programmes were funded by the Foundation for Research, Science and Technology. In 2003, Hugh was part of the bidding team that secured the ARGOS project. He is currently co-leader of the Social Research Objective and is also the Chair of the Academic Research Committee in ARGOS. Hugh has two degrees in Social Anthropology and a Ph.D. in Rural Sociology. His research interests include rural sociology, agricultural change, sustainable agriculture, agri-food systems, new forms of rural/environmental governance and rural masculinities.

11.2 Secondary Supervisor

Dr Jim Williams' research interests include Ngāi Tahu history and language and resource management including mahika kai, as well as comparisons with other Indigenous peoples. He is also conducting international comparisons in Rarotonga and with Native Americans looking at landscape and oral traditions amongst Indigenous Peoples. He has previously supervised fourteen and is currently involved in supervision of seven postgraduate researchers. Dr Williams' has considerable experience and knowledge in methodology appropriate to research into kaupapa Māori. His methodologies have proven equally effective, particularly in achieving relaxed information exchanges in unstructured interviews, in cultural investigations with indigenous peoples other than Māori. His insight, support and guidance is key to this study.

11.3 The Researcher

The researcher, David McKay, conducted a similar study during 1997 and 1998 in completion of a dissertation for a Masters in Applied Science at Lincoln University (with distinction). The 1998 dissertation, entitled *What Do You Hear In 'Learning To Care'?: Understandings and Practices of Environmental Education*, investigated how environmental educators in Canterbury, New Zealand conceptualise their work in relation to the Ministry for the Environment's description of environmental education in policy documents.

David is a PhD candidate at the University of Otago's Centre for Study of Agriculture, Food and Environment, associated with Te Tiaki Mahinga Kai, Te Tumu and the Bioethics Centre.

David's academic background spans Environmental Education (M.App.Sc, Lincoln University), Antarctica Studies (P.G.Cert.Ant.Stud, University of Canterbury), Wildlife Conservation Management (P.G.Dip.Res.Stud, Lincoln University), Parks and Amenity Design (Dip.P,R&T.M, Lincoln University), and Education (Dip.Teach, Christchurch College of Education).

David's education includes considerable experience in a wide range of capacities in the 'real' world. He is an experienced Labourer, Horticulturalist, Agriculturalist, Hunter, Designer, Builder, Planner, Project Manager, Environmental Educator, Advisor, and Classroom Teacher at all levels of the education system, including tertiary (Lecturer and Examiner with the Human Sciences Division, Lincoln University, 1997-1998).

David is a member of the Environmental Risk Management Authority's National Iwi Network and of the New Zealand Association for Environmental Education.

12. Participants

Participants for interview will be mana whenua who are (within a Māori worldview) Māori 'environmental educators' or persons involved in promoting learning towards knowledge, understanding, attitude and practices that allow sustainable interrelationships with the environment and resultant sustainable lifestyle.

12**(a) Population from which participants are drawn:**

i) Mana whenua / participants who are New Zealand Māori in the Murihiku area (South Canterbury, Otago and Southland regions) affiliated to and representative of Kai Tahu in the field of this study;

ii) mana whenua / participants who are New Zealand Māori and of affiliation and standing representative of iwi in 5 of New Zealand's regions (Northland, Waikato, East Coast, Wanganui, Nelson-Marlborough).

12**(b) Specify inclusion and exclusion criteria:**

i) Kai Tahu Kaumatua and/or mana whenua in the Murihiku area (South Canterbury, Otago and Southland regions) who are involved in promoting Māori learning towards knowledge, understanding, attitude and practices that allow sustainable interrelationships with the environment and resultant sustainable lifestyle, within the worldview of Māori peoples. Candidates who do not meet these criteria will not be included as participants in this section of the study.

ii) Kaumatua and/or mana whenua who are involved in promoting learning towards knowledge, understanding, attitude and practices that allow sustainable interrelationships with the environment and resultant sustainable lifestyle, within the worldview of Māori peoples in a selected sample of 5 New Zealand's regions (Northland, Waikato, East Coast, Wanganui, Nelson-Marlborough). Candidates who do not meet these criteria will not be included as participants in this section of the study.

iii) Further, candidates who do not meet the above criteria of 12(b) i) or 12(b) (ii) will not be interviewed as participants in this study.

12**(c) Number of participants:**

i) N= 12 – 18

ii) N= 5

12**(d) Age range of participants:**

Qualification for participation in this study will be selected by merit of participant mana as Kaumatua, Whaea or Matua within the Maori community. Accordingly, participants for interview will be aged of 25 years and older.

12**(e) Method of recruitment:**

i) Candidates, identified by Kai Tahu Kaumatua, will be approached by the researcher first by telephone, who will introduce the referral by Kaumatua,

describe the nature of the study and asked if they would meet to discuss participation. Upon discussion of the contents of the information sheet and consent and agreement to participate, an interview will follow immediately or at another time that best suits the participant, around a cup of tea.

ii) Candidates, identified by mana whenua of the Environmental Risk Management Authority's National Iwi Network as appropriate Kaumatua, will be approached by the researcher first by telephone. The referral will be described along with the nature of the study. The Kaumatua will then be asked if they would like to further discuss participation or to participate. A meeting will then be arranged. At the meeting the contents of the information sheet will be discussed and consent and agreement to participate secured. Wherever possible and appropriate, an interview will follow immediately around a cup of tea.

12**(f) Please specify any payment or reward to be offered:**

Sharing a cup of tea or coffee and a packet of biscuits will be the usual fare.

13. Methods and Procedures:

A variety of research methods will be brought to bear in this study in order to investigate perspectives necessary to provide an objective framework from which to legitimately qualify and substantiate observations and conclusions.

Methods will include:

- *Semi-structured interviews* of mana whenua/participants who are (within a Māori worldview) Māori 'environmental educators' or persons involved in promoting learning towards knowledge, understanding, attitude and practices that allow sustainable interrelationships with the environment and resultant sustainable lifestyle, and;

- *case studies* of what is actually happening within New Zealand communities and/or community groups (proposed as two of Ngāti Awa in the Bay of Plenty and/or Rakiura Māori /'Muttonbirders' and/or 'Te Tai Timu: Tangaroa Nurturing the Hearts and Minds of Tamariki and Rangatahi' programme), and/or the Aoraki Bound programme, and;

- *comparative research* of what happens in other countries in terms of education and environmental education policy and practice, both in official channels and at the grassroots from indigenous peoples perspectives.

Two levels of interviews and related analysis will be undertaken in this study:

1. a concentrated study in the Murihiku area (South Canterbury, Otago and Southland regions), and;

2. a sample study in a spread of 5 regions throughout the remainder of New Zealand in order to compare and test the concentrated southern (Murihiku) study.

Because this study will involve analysis of qualitative interviews and spans a range of disciplines (including Environmental Ethics, Education, Resource Management, Sociology, Anthropology, etc) in search of establishing new theory to explain and address a gap in policy and practice towards achieving sustainability, Glaser and Strauss' 'grounded theory' (1967) has been selected as the appropriate over-arching research approach.

"Grounded theory integrates both the objectivist approach to gathering data and an emphasis on understanding the data through interpretive methods, particularly

constructive, inductive methods" (Williams, 2008, p.16), and " . . . is best understood as fundamentally realist and objectivist in orientation, emphasizing the disciplined and procedural ways of getting the researcher's biases out of the way but adding healthy doses of creativity to the analytical process" (Patton, 2002, p.128).

Berg's (2007) model of a *Spiralling Research* fits within the overarching model of the grounded research approach and, as such, will also be applied throughout the study by way of reflection of the affects of new observations from literature, interviews and case studies as the study proceeds so that adjustments are made.

Kaupapa Māori methodology recommends an unstructured discussion over a number of key points; Māori elders (and elders of other indigenous people) do not respond well to structured interviews and sensitivity is required in appropriately engaging them in an unstructured yet informally directed conversation (hence 'semi-structured') within an appropriate setting (Williams, personal comment, 2011; Holmes, personal comment, 2010).

14. Compliance with The Privacy Act 1993 and the Health Information Privacy Code 1994 imposes strict requirements concerning the collection, use and disclosure of personal information. These questions allow the Committee to assess compliance.

14**(a) Are you collecting personal information directly from the individual concerned?**

YES

14**(b) If you are collecting personal information directly from the individual concerned, specify the steps taken to make participants aware of the following points:**

- the fact that you are collecting the information:

a) the information sheet describes that information is to be gathered and seeks permission for the information to be gathered, and for the information to be gathered in a way that the participant mana whenua are comfortable. For example:

*Your participation in this research will involve **a conversation/interview, requiring approximately 1 hour**, the proceedings of which, if participants are comfortable will be recorded with the use of a digital-recorder, and later transcribed; otherwise permission will be sought for notes to be taken.*

b) The contents of the information sheet will be talked through by the researcher with the participant mana whenua, with the sheet as a script and the participant with a copy. The interview will not proceed without the researcher's satisfaction and confirmation of the participant's understanding.

- the purpose for which you are collecting the information and the uses you propose to make of it:

c) the information sheet describes the purpose of the project and why the information is to be gathered and how it will be used. For example:

You are invited to participate in a project that aims to investigate how 'Education for Sustainability' or 'Environmental Education' is conceptualised, understood and practiced amongst New Zealand Māori and within Māori cultural perspectives.

d) The contents of the information sheet will be talked through by the researcher with the participant mana whenua, with the sheet as a script and the participant with a copy, to ensure understanding. The interview will not proceed without the researcher's satisfaction and confirmation of the participant's understanding.

- who will receive the information:

As above (see interview schedule attachments).

- the consequences, if any, of not supplying the information:

As above (see interview schedule attachments).

- the individual's rights of access to and correction of personal information:

As above (see interview schedule attachments).

14**(c) If you are not making participants aware of any of the points in (b), please explain why:** N/A

14**(d) Does the research or teaching project involve any form of deception?**

NO

14**(e) Please outline your storage and security procedures to guard against unauthorised access, use or disclosure and how long you propose to keep personal information:**

Data relating to this project will be kept in secure storage within the Centre for Study of Agriculture, Food and Environment for a period of five years from the date of its completion. At the end of the Project any specific identifying personal information will be destroyed by the Principal Investigator.

14**(f) Please explain how you will ensure that the personal information you collect is accurate, up to date, complete, relevant and not misleading:**

The mana of participant Kaumatua and mana whenua will ensure the integrity of the information.

14(g) Who will have access to personal information, under what conditions, and subject to what safeguards against unauthorised disclosure?

The positions of those with access to the data and their relationship to the research, is listed on the information sheet, of which the participant will retain a copy for their information. Access to the data will be restricted to Professor Hugh Campbell, Dr Jim Williams and researcher David McKay.

Prior to consent being secured by the researcher, participants will be informed that they will given access to the data in its raw format should they request. Participants will also be informed prior to consent being secured that they may withdraw from the study either during the interview or at any time following up until the publication date of 30 March 2012. This information is also recorded on the information sheet for their record and referral.

Participants will be advised that they will be provided with a summary of findings following

the conclusion of the study.

14**(h) Do you intend to publish any personal information and in what form do you intend to do this?**

Yes, the identity and tribal affiliations of those participants who give their consent, by way of ticking and signing the appropriate section for their consent on the interview schedule, will be listed as a source to this research, along with other sources, upon publication. All other personal information, will remain confidential to the researcher and supervisors. In the case of those participants who do not wish their identity to be listed as a source, yet wish to participate in this research, indicated by way of their ticking and signing the appropriate section for their consent on the information sheet, will not be included in the list of sources but will have a respondent number attached to their identity. All of these participants' personal information, including their name and tribal affiliations, will remain confidential to the researcher and supervisors.

14**(i) Do you propose to collect information on ethnicity?**

Yes, this study is collecting information primarily based on ethnic worldviews, perspectives, understandings and practices and will compare these with Dominant Social Paradigm and contemporary educational and resource management attitudes and practices. See Consultation with Māori Form attached.

15. Potential problems:

There are no foreseeable problems of community relations or controversy, or conflicts of interest, that might arise.

16. Informed consent

See information sheet and consent form attached, along with a guideline for discussion or 'question' sheet.

17. Fast-Track procedure

Do you request fast-track consideration? NO

18. Other committees

If any other ethics committee has considered or will consider the proposal which is the subject of this application, please give details: NIL

19. Applicant's Signature: .....

Date: .....

Please ensure that the person signing the application is the applicant (the staff member responsible for the research) rather than the student researcher.

20. **Departmental approval:** *I have read this application and believe it to be scientifically and ethically sound. I approve the research design. The Research proposed in this application is compatible with the University of Otago policies and I give my consent for the application to be forwarded to the University of Otago Human Ethics Committee with my recommendation that it be approved.*

Signature of *Head of Department: .....

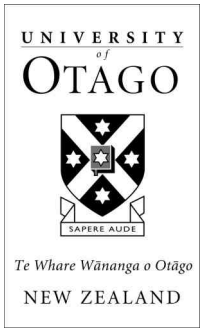
Date: .....

**(In cases where the Head of Department is also the principal researcher then the appropriate Dean or Pro-Vice-Chancellor must sign)*

Please attach copies of the Information Sheet, Consent Form, and advertisement for participants

APPENDIX B – Information Sheet for Participants

11/045
Approved 18 March, 2011



Education for Survival and Sustainability: Indigeneity and Mātauranga Māori

INFORMATION SHEET FOR

PARTICIPANT MANA WHENUA

Hello, my name is David McKay. I am a postgraduate student with the Centre for Study of Agriculture, Food and Environment, and with Te Tumu – School of Māori, Pacific and indigenous Studies, at the University of Otago, undertaking a study for the degree of Doctor of Philosophy.

I seeking to identify and describe how 'Environmental Education' or 'Education for Sustainability', is conceptualised, understood and practiced amongst New Zealand Māori. In other words, I am investigating:

- what is considered to be 'environmental education' or 'education for sustainability', and/or;
- what is needed as 'environmental education' or 'education for sustainability', and/or;
- how 'environmental education' or 'education for sustainability' is thought about (conceptualised), and/or;
- how 'environmental education' or 'education for sustainability' is understood, and/or;
- how 'environmental education' or 'education for sustainability' is or would be practiced and why;

amongst Māori and within Māori cultural perspectives.

Ways in which people have tried to help individuals, groups or communities develop awareness, knowledge, attitudes and skills to understand and care for the environment, and often to resolve environmental issues, have commonly been referred to as 'environmental education'. More recently such efforts have been coined as 'education for sustainability'.

By understanding what is considered to be, or what is needed as, 'environmental education' or 'education for sustainability' and how it is thought about (conceptualised), how it is or would be practiced and why, within and in context with Maori cultural perspectives, such

perspectives and any 'tools' may then be appropriately represented as a cohesive validated approach or pedagogy, and integrated in environmental education policy and practices.

I hope this study will help facilitate meaningful integration of Maori understandings in environmental education (education for sustainability) policy and practices in New Zealand.

I believe that by understanding incorporating such indigenous understandings, we stand some hope of achieving better collective understanding and respect of the New Zealand environment amongst New Zealanders, along with improving understanding of what is needed to achieve lifestyles and practices that are truly ecologically sustainable.

Further, such perspectives, 'tools' and practices may then be integrated in resource planning and management towards achieving ecologically sustainable resource management practices and a sustainable future. I hope that this study may establish a set of tools or at least a template for use in education, planning and management for sustainability within New Zealand and internationally.

My children are my stake in the future and are my motivation.

My overall goal is to contribute in a meaningful way to helping individuals develop awareness, knowledge, understanding, skills, attitudes and capacity for action to live in harmony with the Earth on an ecologically (genuinely) sustainable basis. I aim to do what I can to help ensure that the world my children inherit has an ecologically sustainable future for them and their children's children.

Thank you for showing an interest in this project.

Please read this information sheet carefully before deciding whether or not to participate. If you decide to participate we thank you. If you decide not to take part there will be no disadvantage to you of any kind and we thank you for considering our request.

What Type of Participants are being sought?

a) New Zealand Māori Kaumatua or Matua or Whāea or persons in the Murihiku area (South Canterbury, Otago and Southland regions) who are affiliated to and representative of Kai Tahu;

b) New Zealand Māori Kaumatua or Matua or Whāea or persons who are appropriately representative of 5 of New Zealand's regions (Northland, Waikato, East Coast, Wanganui, Nelson-Marlborough).

What will You be Asked to Do?

Participation in this research will involve **a conversation/interview, requiring approximately 1 hour.** Please be aware that you may decide not to take part in the project at any time without any disadvantage to you of any kind.

What Data or Information will be Collected and What Use will be Made of it?

If you agree, the interview/conversation may be digitally recorded and all conversation during the interview will be later written down or 'transcribed'. This is entirely up to what you are comfortable with. If you do agree for the conversation to be recorded, you will be given opportunity to check and adjust the written transcript before its being analysed against the key points and against responses of other participant mana whenua.

If you do not wish the interview/conversation to be digitally recorded, the researcher will ask you if you mind him taking written notes. Again, this is entirely up to what you are comfortable with. If you do agree for notes to be taken during the conversation, you will be given opportunity to check and adjust the written transcript or raw data before its being analysed against the key points and against responses of other participant mana whenua.

If you do not wish any recording other than by the memory of the researcher, you will be given opportunity to check and adjust the written transcript or raw data interpreting your perspectives before its being analysed against the key points and against responses of other participant mana whenua.

The data collected will be securely stored in such a way that only those mentioned below will be able to gain access to it. At the end of the project any personal information will be destroyed immediately except that, as required by the University's research policy, any raw data on which the results of the project depend will be retained in secure storage for five years, after which it will be destroyed.

The results of the project will be published as a thesis and will be available in the University of Otago Library (Dunedin, New Zealand). It is also likely that results will be published in journals as well as being the basis for presentations and other publications aimed at informing policy and practice in education for sustainability and survival.

What am I Agreeing to?

The mana of each of the mana whenua participating in this research is important to the credibility and potential level of influence of the conclusions and recommendations of this study. The researchers understand that mana is borne by the humble identity and reputation of an individual.

On the Consent Form you will be given options regarding your anonymity. Please be aware that we will make every attempt to preserve your anonymity to the degree agreed for your participation in this study.

With your permission, confirmed by way of you ticking 'Yes' and your signature in the first consent section on the attached consent form, your name and tribal affiliations will be listed as a source to this research, along with other sources, upon publication.

Should specific statements made by you be useful as examples or explain key ideas, your permission will be sought to attribute these to you as a citation. All other personal information, will remain confidential to the researcher and his supervisors.

Should you not wish your identity to be listed as a source to this research, yet wish to participate in this research, please tick in the 'Yes' box with your signature in the second consent section of the attached consent form. Having done so, all your personal information, including your name and tribal affiliations, will remain confidential to me, as researcher and my supervisors. Any referral to statements sourced from you will kept anonymous.

This project involves a semi-structured questioning technique covering key points. The general line of questioning will be based on key points set out below:

In the event that the line of questioning does develop in such a way that you feel hesitant or uncomfortable you are reminded of your right to decline to answer any particular question(s) and also that you may withdraw from the project at any stage without any disadvantage to yourself of any kind.

Can I Change My Mind and Withdraw from the Project?

You may decline to answer questions or withdraw from participation at any time if you become uncomfortable during the interview without any disadvantage to yourself of any kind.

You may withdraw your permission for me to use the transcript of your interview up until 30 March, 2012 and, if you choose to do so up to that date, the transcript will be destroyed.

What if I have any Questions?

If you have any questions about our project, either now or in the future, please feel free to contact either:-

David McKay *(Researcher)*
Centre for Study of Agriculture, Food and Environment
University of Otago
P.O. Box 56
Dunedin
Telephone: (03) 479 8294 Mobile: (027) 248 4288
Email: mckda154@student.otago.ac.nz

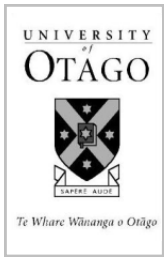
OR

Professor Hugh Campbell *(Primary Supervisor)*
Department of Sociology, Gender & Social Work / CSAFE
University of Otago
P.O. Box 56
Dunedin
Telephone: (03) 479 8749
Email: hugh.campbell@otago.ac.nz

This study has been approved by the University of Otago Human Ethics Committee. If you have any concerns about the ethical conduct of the research you may contact the Committee through the Human Ethics Committee Administrator (ph 03 479 8256). Any issues you raise will be treated in confidence and investigated and you will be informed of the outcome.

APPENDIX C – Consent Form for Participants

11/045
Approved 18 March, 2011



Education for Survival and Sustainability: Indigeneity and Mātauranga Māori

CONSENT FORM FOR

PARTICIPANT MANA WHENUA

I have read the Information Sheet concerning this project and understand what it is about. All my questions have been answered to my satisfaction. I understand that I am free to request further information at any stage.

I know that:-

1. My participation in the project is entirely voluntary;

2. I am free to decline to answer questions or withdraw at any time without disadvantage if I become uncomfortable during the interview / discussion / conversation;

3. this project involves an semi-structured questioning technique during an interview / discussion / conversation that will cover key points that I have been introduced to;

4. The general line of questioning includes what I understand of terms relating to the environment, education and learning in kaupapa Māori, how I came to know and understand these things and how and why I pass such understandings on to others;

5. The precise nature of the questions will depend on the way in which the interview develops;

6. I will be given opportunity to check and correct the transcript or information otherwise resulting from the interview / discussion before it is analysed;

7. I may withdraw my permission for use the transcript or information otherwise resulting from the interview / discussion up until 30 March, 2012 and, if I choose to do so, the transcript or information otherwise resulting from the interview / discussion will be destroyed;

8. My permission will be sought and secured for the any specific statements made by me to be used in the publication as examples or explain key ideas in the publication;

9. All other personal information, will remain confidential to the researchers;

10. Personal identifying information including digital recordings or transcripts information otherwise resulting from the interview / discussion other than raw data will be destroyed at the conclusion of the project;

11. Any raw data on which the results of the project depend will be retained in secure storage for at least five years;

12. The results of this project will be published as a thesis and will be available in the University of Otago Library (Dunedin, New Zealand);

13. It is also likely that results will be published in journals as well as being the basis for presentations and other publications aimed at informing policy and practice in education for sustainability and survival.

CONSENT SECTION 1

I agree to take part in this research project, **with my name and tribal affiliations being listed as a source to this research upon its publication,** with my permission being sought and secured for any citation of specific statements made by me to be used in publication as examples or explanations, and with all other personal information remaining confidential.

Yes [ ] No [ ] NAME: .....

SIGNATURE: ..... …….....

(Signature of participant) (Date)

CONSENT SECTION 2

I agree to take part in this research project, **without my name and tribal affiliations being listed as a source to this research upon its publication,** with all personal information remaining confidential and with any referral to statements sourced from me to be kept anonymous.

Yes [ ] No [ ] NAME: .....

SIGNATURE: ..... …….....

(Signature of participant) (Date)

This study has been approved by the University of Otago Human Ethics Committee. If you have any concerns about the ethical conduct of the research you may contact the Committee through the Human Ethics Committee Administrator (ph 03 479 8256). Any issues you raise will be treated in confidence and investigated and you will be informed of the outcome.

APPENDIX D – Interview Questions

ENVIRONMENTAL EDUCATION INTERVIEW

KEY POINTS / QUESTIONS FOR THE RESEARCHER TO POSE WITHIN CONVERSATION / INTERVIEW:

1. Tell me something about yourself – where are you from? What is important to you?

2. What do you these words mean to you, if anything?:

    a. ***'The Environment'?***
    b. ***'Education'?***
    c. ***'Learning'?***
    d. ***'Environmental Education'?***
    e. ***'Education for Sustainability'?***
    f. ***'Lifeskills'?***

3. What is the ***relationship*** between people and the environment?

    a. Where does your ***knowledge*** of this relationship come from?

    b. ***How did you learn*** about this relationship?

    c. How do (or would) you ***pass on*** this knowledge?

4. Do you have a ***typical approach*** in passing on knowledge and understanding of the environment and of people's relationship with the environment?

    a. What sorts of things ***influence*** your approach?

    b. Would you ***change*** this approach at any time? And why?

5. What do you think ***needs to be done*** by educators and leaders to make sure that the environment is a clean and healthy and able to support our children's-children's-children?

Thank you *for your time.*

If you require more information about this study, please contact:

David McKay *(Researcher)*
Centre for Study of Agriculture, Food and Environment
University of Otago
P.O. Box 56
Dunedin
Telephone: (03) 479 8294
Mobile: (027) 248 4288
Email: mckda154@student.otago.ac.nz

Professor Hugh Campbell *(Primary Supervisor)*
Department of Sociology, Gender & Social Work
Senior Researcher CSAFE
University of Otago
P.O. Box 56
Dunedin
Telephone: (03) 479 8749
Email: hugh.campbell@otago.ac.nz

APPENDIX E – Interview Details

Participant	Code	Location of Interview	Situation of Interview	Mode of Interview	Duration
Tahu Potiki	T1	Dunedin	Email	Email	N/A
Identity confidential	T2	Dunedin	konahi ki te konahi	konahi ki te konahi	1 hour
Rawinia Puna	T3	Dunedin	Lounge and dining room of researcher	konahi ki te konahi	2 hours 27 minutes
Hori Parata	T4	Whāngārei	Participant's home, travelling rohe, various activities and locations	konahi ki te konahi	3 days, 2 evenings
Abraham Witana	T5	Kerikeri	Field activity and shed aside from Whare Nui on Kerikeri Marae	konahi ki te konahi	3 hours
Linda Faulkner	T6	Wellington	ERMA Meeting Room	konahi ki te konahi	2.5 hours
Tui Shortland	T7	Whāngārei	Skype audio visual	Skype audio visual	1 hour 10 minutes
Dr Hauiti Hakopa	T8	Dunedin	Otago University office	konahi ki te konahi	5 hours 7 minutes
Zack Makoare	T9	Napier	Skype audio visual	Skype audio visual	3 hours 12 minutes
Hinewai Ngatai	T10	Dunedin	Otago University meeting room	konahi ki te konahi	2 hours 15 minutes
Te Moengarau Hemopo	T11	Dunedin	Participant's home	konahi ki te konahi	2 hours
Chris Holtham	T12	Dunedin	Te Moengarau Hemopo's home	konahi ki te konahi	1 hour
Dr Pip Pehi	T13	Whakatane	Skype audio visual	Skype audio visual	1 hour 15 minutes
Identity confidential	T14	Gisborne	Participant's home, travelling rohe, various activities and locations	konahi ki te konahi	3 days, 1 evening

APPENDIX F – Summary Table of Philosophical and Pedagogical Objectives, Outcomes and Methods of EE/EfS informed by Māori Culture

Participant	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14
Whakapapa / Connectedness / Relatedness		WH C PPF RT S/W	WH C RT S/W	WH C PPF RT S/W	WH C PPF S/W	WH C PPF RT S/W	WH C RT S/W	WH C PPF RT S/W	WH C RT S/W	WH C PPF S/W	WH C RT S/W	WH C PPF RT	WH C PPF RT S/W	WH C PPF RT S/W
Identity / Self Well-being	SI	SI SK SE SW As	SI SK SW As	SI SK SW As	SI SK SE SW AT As	SI SK SE As	SI SK SW As	SI SK SW AT As	SI SK SE SW As	SI SK SW As	SI SE SW	SI SK SE SW As	SI SK SE SW AT As	SI SK SW As
Survival Skills		SWI SU MC P LS TC	 P LS ECA	SWI SU MC P LS	SWI SU MC P LS TC ECA	 MC P LS TC	 SU MC LS ECA	SWI SU MC P LS TC ECA	 SU MC P LS	SWI MC P LS TC	 SU MC P LS	 MC LS TC ECA	 SU MC P LS TC ECA	 P LS
Community Strength & Well-being / Rōpūtanga	M	WN WT WB M T	CCC WN WT WB M T	WN WB M T	CCC WN WT WB M T	 WB M T	WN WT WB M T	CCC WN WB M T	 WT WB M T	WN WB M T	 WT WB M T	WN WB M T	CCC WN WT WB M T	WN WT WB M T
Elements of Core EE/EfS Goals	AW K I About EA EC	AW K C A/V S I G In About For EA ES EC EL R	AW K U C A/V S I F In About For EA ES EC EL SP R	AW K U C A/V S G F In For EA ES EC EL	AW K U C A/V S G F In For EA ES EC EL SP	AW K U C A/V I G F In About EA ES SP R	AW K C A/V S F In About For EA ES EC EL	AW K U C A/V S G F In For EA ES EC EL SP R	AW K U C A/V S G In About For EA ES EL	AW K C A/V I G F In For ES EC EL R	AW K U C A/V S I G In About For ES	AW K U C A/V S I F In For EA ES EC EL	AW K U C A/V S G F In About For EA ES EC EL SP R	AW K U C A/V S I G F In About For ES EC EL
Transferral & Continuance	 RM CT	KP IS RM AC FA WW LL HV CW CT V A K DP swc	IS ET FA WW LL HV CW CT V A K swc	KP IS ET RM AC WW LL CW CT V A K DP swc	KP IS ET RM AC FA WW LL HV CW CT V A K DP swc	KP IS ET RM FA WW LL HV CW CT V A K DP swc	 ET RM AC WW HV CT V A K DP swc	KP IS ET RM AC FA LL HV CW CT V A K DP swc	KP IS ET FA WW LL HV CW CT V A K DP swc	KP RM AC WW HV CW CT V A K swc	IS RM FA WW LL CW CT V A K swc	KP IS ET RM AC WW LL HV CW CT V A K DP swc	KP IS ET RM FA WW LL HV CW CT V A K DP swc	KP IS ET RM AC FA WW HV CW CT V A K DP Swc

Key:

Inter-connections and Relationships - Whakapapa and Whanaungatanga

GG	for the Greater Good	PPF	Past/Present/Future
NR	No Response	RT	Respect
SW	Spiritual / Wairua		
WH	Whakapapa – knowing who & what you are & where you stand & inter-		relationships

Self-Identity, Self-well-being and Self-actualisation / Mōhioake, Hauoratanga, Atuatanga

As	As one with / part of the Environment	AT	to become Atua
SE	Self-Esteem/Self-worth	SI	Self-Identity
SK	Self-Knowledge	SW	Self-Well-being

Survival Skills – Tū Motuhake

ECA	Environmental Contextualisation / Adaptability		
LS	Life Skills	MC	Meaningful Context
P	Practical	SU	How to live ecologically 'Sustainably'
SWI	Survival With Integrity	TC	Thinking Critically

Community Cohesion, Community / 'Resource' Well-being Whakawhanaungatanga, Rōpūtanga and Kaitiakitanga

CCC	Communication/Collaboration/Cooperation		
M	Mātauranga Māori/Traditional		
WB	Well-being	WN	Whakawhanaungatanga
WT	Working Together/Rōpūtanga	T	Tikanga & Ethics

Transferral and Continuance: Elements of Core EE/EfS Goals

AW	Awareness	About	About the Environment
A/V	Attitude & Values	C	Connection
EA	Environmental Awareness	EC	Environmental Competence
EL	Environmental Literacy	ES	Environmental Sensitisation
F	Facilitation	For	For the Environment
G	Guidance	I	Information
In	In the Environment	K	Knowledge
R	Read / Write	S	Skills
SP	Shifting Paradigms	U	Understanding

Mātauranga Māori / Tikanga Taiao

A	How to listen & speak	AC	Assessment on Competence
CT	Critical Thinking	CW	Community Well-being
DP	Develop a Position	ET	Everyone is a Teacher / Learner
FA	Flexible & Adaptable	HV	Whole Person Valued
IS	Individual Specific	K	How to do / practice
KP	Know Learning Purpose	LL	Learn how to Learn
RM	Relevant & Meaningful	SWC	Survival, Well-being and Continuance V
	How to Observe	WW	What Works vs. What doesn't