

UNIVERSITY LEADERSHIP FOR SUSTAINABILITY

AN ACTIVE DENDRITIC FRAMEWORK FOR ENABLING CONNECTION AND COLLABORATION

By

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Abstract

In a world with increasing environmental and social problems, education is widely accepted as being critical for meeting current and predicted sustainable development issues. This thesis explores possible reasons for the relatively low levels of education-for-sustainability programmes in universities in Aotearoa New Zealand, compared to selected international universities with coherent inter-disciplinary sustainability programmes of learning.

The research involved qualitative in-depth interviews with two sub-sets of academic participants teaching in universities, twenty from selected international universities and ten from universities in Aotearoa New Zealand. A grounded theory methodology approach was chosen to analyse the extensive range of qualitative data. Analysis revealed generic essential themes underlying the experiences of the two sets of participants. Key themes included the importance of building connections between distributed sustainability leaders and the need for support from hierarchical university leadership for developing substantive sustainability learning initiatives.

A theoretical model is proposed: an active dendritic framework for university leadership for sustainability, for improving collaborative learning within and across disciplinary areas, and building capacity for university-wide learning, leading to establishing coherent sustainability initiatives.

Recommendations are offered for improving the uptake of education-for-sustainability in universities in Aotearoa New Zealand, based on the research findings and the potential for using the dendritic framework for assisting connection and collaboration between transformational sustainability leaders within the university.

"For in the final analysis, our most basic common link, is that we all inhabit this small planet, we all breathe the same air, we all cherish our children's futures, and we are all mortal."

John F. Kennedy, 1963. Speech delivered at American University,
Washington, DC, 10 June 1963.

Acknowledgements

I am often asked “why did you embark on a PhD”? when, with adult children living away from home, theoretically I had time to indulge other interests. It came about while working part-time within the university, when I realised that learning for sustainability, my intellectual focus, was not practiced as I had presumed – so I set out to find out why, with highly valued help from research participants, worldwide.

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GLOSSARY

Disciplinary terms

In this thesis the terminology used to describe different disciplinary terms is based on the suggestions made by Duguet (1973), as cited in Emmelin (1975:13):

“discipline – a specific body of teachable knowledge with its own background of concepts, procedures, and methods.

multidisciplinary – juxtaposition of various disciplines, sometimes with no apparent connection between them

interdisciplinary – an adjective describing the interaction between two or more different disciplines. This interaction may range from simple communication of ideas to the mutual integration ... over a wide field”

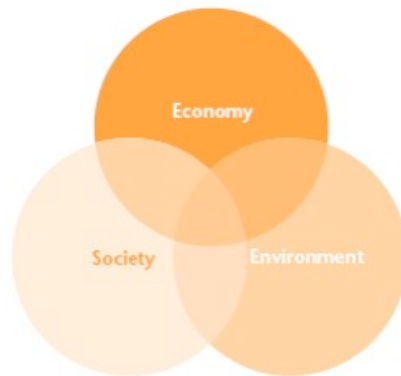
In addition, the following term is used:

transdisciplinary – describing the integrative nature when different disciplines find ways of working together to understand and create knowledge and solve problems that are not the domain of one discipline. Emmelin describes transdisciplinary as “establishing a common set of axioms for a set of disciplines”. However, it is more than ‘axioms’, rather a postmodern point-of-view of collaboration and cooperation for the future.

New Zealand Parliamentary Commissioner for the Environment (PCE) – an independent, parliamentary, environmental watchdog in New Zealand. As an independent Officer of Parliament, the PCE has wide-ranging powers to investigate environmental concerns. ‘Independent’ means independent of the government of the day, so the PCE reports not to a Government Minister but to Parliament.

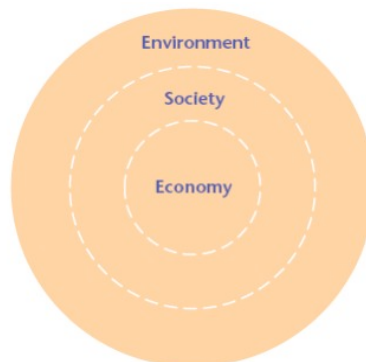
Sustainability models

(a) Weak sustainability model



“There is some common ground where each of the circles converge, but the main priority in this model is the health of the economy. Economists sometimes refer to this as the weak sustainability model it assumes that the degradation of one group of assets, (environmental, social or economic) can be compensated for by improvement in another and that externalities can be externalised (PRISM and Knight, 2000, cited in PCE, 2002). This weak sustainability model fails to acknowledge the ecological constraints that humans, other species, markets, policies and developments must operate within” (PCE, 2002).

b) Strong sustainability model



“This model recognises that the economy is a subset of society (i.e. it only exists in the context of a society), and that many important aspects of society do not involve economic activity. Similarly, human society and the economic activity with it are totally constrained by the natural systems of our planet” (PCE, 2002).

ACRONYMS

ARIES	Australian Research Institute in Education for Sustainability
ASEN	Australian Student Environment Network
CETL	Centres for Excellence in Teaching & Learning
CREE	Centre for Research in Educating and the Environment
DfES	United Kingdom's Department for Education and Skills
EE	Environmental Education
EFS	Education-for-Sustainability
ESD	Education for Sustainable Development
HE	Higher Education
HEFCE	Higher Education Funding Council for England
HEPS	Higher Education Partnership for Sustainability
IPCC	Intergovernmental Panel on Climate Change
IUCN	The World Conservation Union
MEA	Millennium Ecosystem Assessment
NCEA	National Certificate of Educational Achievement
NEFS	National Education-for-Sustainability
NGO	Non Governmental Organisation
NZAAE	New Zealand Association for Environmental Education
NZBCSD	New Zealand Business Council for Sustainable Development
NZSSES	New Zealand Society for Sustainability Engineering and Science
PBRF	Performance Based Research Fund
PCE	New Zealand Parliamentary Commissioner for the Environment
RCE	Regional Centre of Expertise
SANZ	Sustainable Aotearoa New Zealand
SDC	United Kingdom's Sustainable Development Commission
SDPOA	Sustainable Development Programme of Action
SBN	Sustainable Business Network
TEC	Tertiary Education Commission

TES	Tertiary Education Strategy
TNSFANZ	The Natural Step Foundation, Aotearoa New Zealand
ULSF	University Leaders for a Sustainable Future
ULSF– APEC	University Leaders for a Sustainable Future – Asia Pacific Economic Community
UN	United Nations
UNCED	United Nations Conference on Environment and Development
UNDESD	United Nations Decade of Education for Sustainable Development
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Economic Programme
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNESCO – EPD	International Conference on Environment and Society: Education and Public Awareness for Sustainability
UNCSD	United Nations Commission of Sustainable Development
UNU -APEC	United Nations University – Asia Pacific Economic Community
WCED	World Commission on Environment and Development
WSSD	World Summit on Sustainable Development
WWF	Worldwide Fund for Nature
3WEEC	Third World Conference on Environmental Education

CHAPTER ONE

Introduction

**We are now faced with the fact, my friends, that tomorrow is today.
We are confronted with the fierce urgency of *now*.** (emphasis added)

(Dr. Martin Luther King Jr., 1967)¹

1.1 Introduction

The call for Higher Education to take a leading role in education for sustainability for a more sustainable future is increasingly insistent. Education is globally acknowledged as the critical platform for enabling all sectors of society to learn how to manage change and make transitions in practice away from unsustainable practices. Therefore, there is an increasing focus on the role of the formal education sector, in partnership with the community, as a key player in facilitating the societal learning required to meet growing environmental and social sustainability challenges. In addition, there is an expectation from society that universities will undertake a leadership role in facilitating learning that enables current and future generations to re-design their personal and professional activities, for creating a more sustainable future.

Since 1968 the United Nations Educational, Scientific and Cultural Organisation (UNESCO) has been driving the agenda for education for sustainability across all sectors of society, in partnership with a range of other international organisations. Increasing concern about the role of higher education is recorded in a number of international and national declarations, especially following the United Nations Conference on Environment and Development (UNCED) and the adoption of Agenda 21 at that conference, - often referred to as the 'Earth Summit' - held in Rio

¹ King, M.L. 1967. *Beyond Vietnam: A time to break silence*. Speech delivered 4 April 1967, at a meeting of Clergy and Laymen Concerned About Vietnam at Riverside Church, New York City.

de Janeiro, Brazil, 3-14 June, 1992. Agenda 21 is a comprehensive plan of action intended to be taken globally, nationally and locally by organisations of the United Nations (UN), governments and all major sector groups in every area in which humans impact on the environment. The United Nations Commission of Sustainable Development (UNCSD) was established in December 1992 to monitor and report on implementation of the agreements at all levels: local, national, regional and international.

Since then, a series of UNESCO conferences, including the World Conference on Higher Education in the Twenty-first Century: Vision and Action (UNESCO, 1998) has continued to advocate for changes in human attitudes and behaviours, leading towards a more sustainable future. Ten years after Agenda 21, implementation and commitments to the Rio principles were strongly reaffirmed at the 2002 World Summit on Sustainable Development (WSSD) held in Johannesburg, South Africa. At that time a call was made for a stronger focus on education for sustainable development, leading to the United Nations declaring 2005-2014 to be the United Nations Decade of Education for Sustainable Development (UNDESDec).

This decade has seen a rapidly rising number of conferences focusing on education for sustainable development (or sustainability), including debate on the perceived lack of progress being made in learning for sustainability, in institutions of higher learning. Claims are made by scholars and educational practitioners in the field of sustainability that universities have a professional and ethical obligation to become much more explicitly and effectively involved in contributing significantly to learning for sustainability. There is an imperative for universities to address how to begin implementation or to enhance their current sustainability initiatives, in order to meet societal expectations.

Initially, the focus of this thesis was on finding successful processes for implementing sustainability initiatives in universities. However, as my research progressed, my focus changed to seeking *how*, rather than *what* sustainability learning initiatives were being developed and implemented.

A grounded theory method of analysis revealed findings, leading to key themes underlying the differences in sustainability learning programmes between international universities and those in Aotearoa New Zealand. The role of university leadership for sustainability emerged as an important factor that helps explain these differences and consequently is the focus of this research. I discuss these leadership themes, relate them to the emergent leadership theory and describe how this led to generating a theoretical model that may be useful for connecting and enabling collaboration between university leaders for sustainability.

I explore key processes enabling the successful implementation of education-for-sustainability in selected international universities and compare those processes with universities in Aotearoa New Zealand, finding theoretical coherence with my proposed model.

In this Introductory Chapter I explore the background context leading to my interest and involvement in sustainability education, explain the dimensions of the new learning paradigm of ‘education-for-sustainability’ (EFS), then outline the international framework that supports integrating education-for-sustainability into higher education. I present the research goals and aims of this thesis, highlight my reasons for undertaking this study (described more fully in Chapter Two) and introduce the research epistemology, methodology and methods used to investigate my area of concern.

My choice of research methodology (described fully in Chapter Four) resulted in gaining fresh insights that led to investigating the importance of effective university leadership for enabling the implementation of sustainability initiatives. Eventually, following analysis and reflecting on the emerging theme of leadership I generated a theoretical model: *an active dendritic framework for university leadership for sustainability*.

I explain how my research contributes to the debate and applied research field exploring education-for-sustainability and finally I outline the general structure and chapter content of the thesis to provide the reader with the opportunity to engage with particular elements of this research as well as the entire thesis.

1.2 The global scene

This first decade of the third millennium will be remembered for rapidly increasing international recognition, leading to global consensus, that the rate of global warming is accelerating, exacerbated by humans' past and present unsustainable practices. These practices, including greenhouse gas emissions, deforestation, excess consumption of finite resources, reducing global biodiversity and contamination of water supplies, result in human-induced effects that negatively impact on our quality of life.

Politically, most countries, including New Zealand, agree that the debate about global warming is over, that climate change is a key symptom of how humans have impacted on planetary systems and that it is time for collaboration to help transform our institutional and individual practices, if future generations are to inherit a sustainable future. Since the 1960s, rising numbers of academic papers and popular literature articles have reflected the growing societal concern about increasing national and global environmental and social problems, many calling for urgent measures to address the challenges of predicted climate change variations.

In response to this concern, many international organisations, including the United Nations Education and Scientific Cultural Organisation (UNESCO), the World Conservation Union (IUCN) and the United Nations Economic Commission for Europe (UNECE) (one of the five United Nations world economic regions), developed declarations and guiding policies for sustainable development for a sustainable future. Some countries (for example, Australia, Canada and Taiwan) created government-led sustainability departments and others (for example, Sweden and Netherlands) formulated new laws aimed at encouraging new ways of thinking, re-orienting practices and learning how better to meet both current and predicted global challenges.

In 2006 the economist Nicholas Stern released a 700-page report for the British Government discussing the effect of global warming and consequent climate change on the world economy. This *Stern Review on The Economics of Climate Change* (2006) is arguably the most widely discussed report on the economic effects of climate change, and despite criticism of his methodology from some economists, others have supported

his financial estimates. Stern maintains that if we do not understand the problems and learn the skills needed to maintain our physical and social well-being in the more volatile future that is predicted, then we are effectively choosing to consign future generations of humans to living in increasingly stressful circumstances.

The authoritative scientific report from the Intergovernmental Panel on Climate Change (IPCC, 2007) presented alarming figures of the accelerating rate of climate change effects, and predicted social and economic crises would result from future environmental changes. Given the general consensus that ‘doing nothing is not an option’, politicians from many countries (including Aotearoa New Zealand), made aspirational statements about the urgency and need for changed practices, particularly within the next 10-20 years, to avoid planetary climatic catastrophe, as discussed further in Chapter Seven.

Transformation of global societies from mainly unsustainable practices to a more sustainable way of living will involve significant paradigm shifts, particularly from the current economic paradigm, in which it is presumed that a society can only develop by expanding its use of resources and increasing per capita consumption patterns, despite the long term negative effects of this behaviour (Daly, 1996). Given the global situation of rapidly increasing environmental problems, linked inextricably and contributing greatly to rising social and economic issues, citizens need to achieve a better understanding of how dependent they are on planetary ecosystems (Orr, 1992; Sterling, 2004b). Such understanding is key in a sustainability paradigm.

Different sectors of society tend to focus on sustainability issues that affect them and talk about sustainability according to their cultural context, deriving definitions and explanations that are not wrong, but often not complete because of their uni-dimensional focus. An example is the focus on ‘economic development’, usually implying an expanding economy and consumption, rather than implicitly increasing quality of life. Other foci may be the depletion or degradation of environmental resources, social development problems such as equity and peace or economic issues that affect the ‘progress’ of a given community or nation.

The critical role of education for enabling society to navigate and adapt to current and future challenges has been clearly stated, and re-iterated since the 1970s, by major international agencies such as; UNESCO, in 1975, 1977, 2002 and 2003, IUCN, in 1970, 1991 and 2006 and WWF in 2005. In a position paper on global sustainability UNESCO (2002:4) states:

With respect to higher education, there will be emphasis on the role of universities in refining the concept and messages of education for sustainable development, integrating environmental, demographic, economic, social and a range of other concerns inherent in the notion of sustainability. In re-orienting their research programmes and curricula, key will be the universities' capacity for flexible interdisciplinary cooperation and for collaboration with outside institutions... Universities will have to experiment by exercising more initiative and by risking new approaches.

Numerous scholars, teaching practitioners and international policy makers have shown that education is central to learning how to re-design our social (including institutional) and individual practices. Furthermore, such education must enable learners to assume responsibility for creating a sustainable future (UNESCO, 2003). UNESCO stresses that it is imperative, for future inter-generational equity, that humans improve their ability to live sustainably.

But, what *is* sustainability and what is meant by sustainable? The *New Shorter Oxford English Dictionary* (1993) defines and gives as one of the definitions of the word 'sustainable' the description 'able to be maintained at a certain rate or level'. There are many, slightly differing definitions, that together describe the understanding of what sustainability or sustainable development means, in the context of societal concerns about the future. A universally accepted definition of sustainable development is the much quoted "Meeting the needs of the present generation without compromising the ability of future generations to meet their needs" from the World Commission on Environment and Development (WCED) *Our Common Future* (1987:8).

There are a number of models for representing how the environmental, social and economic dimensions of sustainable development are integrated, and it is the 'strong sustainability' model of embedded circles, as described by the New Zealand Parliamentary Commissioner for the Environment (PCE, 2002:7), that recognises that economic contexts exist within a social context and human societies are both

dependent on and constrained by Earth's ecosystem resources. In contrast, 'weak sustainability' reflects a belief that the environment, economy and society are separate and competing interests. It suggests that social and environmental problems can be solved by focusing mainly on economic development rather than focusing on the inter-relationships of the three contexts (PCE, 2004:15). Further explanations of these sustainability terms may be found in the Glossary, preceding this chapter.

Stephen Sterling, a leading scholar in the field of education-for-sustainability, defines sustainability as "the ability of a system to sustain itself, in relation to its environment" (Sterling, 2004a:52). His discussions center on the interconnectedness of the ecological paradigm, leading to a call for sustainable education. Understanding ecological interconnectedness and human dependence on ecosystems are key features of the sustainability paradigm.

The role of education declarations and the development of the terminology related to learning and educating for sustainability are outlined in Chapter Two, as part of the background to this thesis.

1.3 Why Education-for-Sustainability?

Education-for-sustainability is an emerging field of understanding in which we *all* need to engage, to enable our navigation towards a sustainable future. This new form of education aims to be transformative, to engage both educators and learners in the process of becoming active participants and decision-makers in their journey along the sustainability path. In order to facilitate this process, educators learn new skills, including ways of collaborating, negotiating and building partnerships with those they engage with.

Education-for-sustainability presumes participating in a genuinely collaborative way of learning, essentially it is learning that takes place within and between *all participants* in a society, whether involved in education, research, government, business, community, home-making or any sector of a nation.

In essence, EFS is a completely different learning paradigm, open, flexible, responsive, trust building, creative, participatory and engaging in politics and

science. This is why it is so relevant, and also why it is so challenging.
(T. O’Riordan, personal communication, 20 March, 2007)

A number of scholars, including John Blewitt (2004, 2005, 2006), John Fien (2002), Walter Filho (1999, 2000, 2002a, 2002b), Joy Palmer (1998), Stephen Sterling (1996a, 1996b, 2001, 2003, 2006) and Daniella Tilbury (1995, 1998, 2003, 2004, 2005,) continue to make many important contributions, both informing and challenging academic and practitioner thinking about education-for-sustainability in higher education and I refer to their, and others’ work in this thesis. A leading contributor to both international and Australian research in the field of education-for-sustainability, Tilbury (2004:98) argues that “Environmental Education for sustainability is an innovative and interdisciplinary process requiring participative and holistic approaches to the curriculum” and considers that there is a need for innovation, rather than integration of education-for-sustainability .

Sterling (2001, 2003) advocates strongly for educational transformation to ‘sustainable education’ and argues for re-orientation of educational policies, programmes and practices using the synergy between ecological and systemic thought. Sterling suggests that we need to undertake an educational journey from present to future teaching pedagogies that practice sustainable education.

In his preface to *Teaching Sustainability at Universities*, Filho (2002b:16) comments that sustainability includes developing “a way of thinking which relates to considerations on aspects of equality, ethics and gender, not to mention the issue of development and aid and how they relate to better living conditions” and documents a growing number of case studies of successful sustainability learning initiatives in higher education. Rowe (2002) favours the use of sustainability concepts so they become an integral part of all higher education degrees, given the challenges facing tertiary students in this century, and O’Riordan (1994) challenges governments and universities to focus on learning for sustainability as a key measure for addressing looming sustainability living problems.

This view is supported by many other commentators, including state leaders, leaders of NGOs, academics and students themselves, as discussed in the following chapters. Support for the re-orientation of educational programmes to include a sustainability focus is building, as evidenced by the 2002 launch of a scholarly journal, *The*

International Journal of Sustainability in Higher Education and increasing numbers of academic articles, books and conference publications, across a range of academic sectors.

Nevertheless, in 2002, while working as an education-for-sustainability advisor to secondary teachers, and influenced by being an ecologist and teacher by training and interest, I wondered why New Zealand universities were responding so slowly to the need to have a society that understands and prepares for the predicted challenges of environmental impacts.

1.4 International Framework for EFS

Following the international recognition of the need for Education-for-Sustainability (EFS) and the argument that a sustainable future is the present and future challenge for life in the twenty-first century, hundreds of universities in other countries (including Australia, Canada, United Kingdom, Germany, the United States of America and the Netherlands) are making substantive efforts to provide their students with appropriate opportunities to learn, through education-for-sustainability, the skills that will help them adapt to a different, preferably more sustainable, future. Newman (2006) describes the development of learning for sustainability opportunities at Murdoch University, including student research placements in the community.

There are now (as at April 6, 2008) 366 university leaders from 50 countries (not including Aotearoa New Zealand) who have signed up to the Talloires Declaration (ULSF, 2004). This declaration (Appendix 1) is the first international document with a specific focus on sustainability and the first “official statement given by administrators of a commitment to environmental sustainability in academe” (Wright, 2004:10). The intention of the initial 22 university presidents, vice-chancellors and rectors who met at the 1990 Tufts University European Centre in France was to discuss how higher education could contribute to an environmentally sustainable future.

Signatories to the Talloires Declaration promise to use the Sustainable Development agenda to begin re-orientation of operational practices, curriculum reform, learning programmes and research activities (ULSF, 2007). In Europe, 290 higher education institutions have endorsed the CRE-COPERNICUS charter, committing to establishing learning for sustainability in higher education, and the numbers steadily increase. The noted international declarations and agreements related to sustainability in higher education are listed in Appendix 3.

Increasingly, international universities are focusing on planning for change and taking steps to contribute, through their teaching and learning programmes and operational management practices, to more sustainable practices. For example, the progress of a number of universities in the United Kingdom is described in the Report of the Higher Education Partnership for Sustainability 2000-2003, *On course for Sustainability*, published in April, 2004. The statement of aims describes the focus of the project as follows (HEPS: 2004):

The aim of the Higher Education Partnership for Sustainability (HEPS) is to establish a pioneering partnership group of eighteen higher education institutions, seen to be achieving their strategic objectives through positive engagement with the sustainable development agenda

The report is detailed in its analysis of the effectiveness of the project, the significance of the learning and community partnerships to the universities and the challenges to changing current university practices. The preface comments that despite excellent progress under the leadership of the eighteen Vice Chancellors and Principals who initially signed up for the partnership, there is still much to do.

Closer to New Zealand, there are a number of Australian initiatives. Australian universities were surveyed in the *Universities and Sustainability* report (Bekessy et al., 2003) to determine their progress in implementing sustainability policy and practice, including curricula programmes. The report concluded that there is movement among most universities, but that there is still a long way to go. One of the recommendations urges integration of sustainability learning across the curriculum.

Some universities, for example in Australia and the Netherlands, are increasingly influenced by their stakeholders, and have developed pilot projects or focused research

initiatives, in response to increasing research opportunities provided by businesses seeking to move away from current unsustainable practices. In Australia, corporate stakeholders at a university-industry summit argued that all higher education students, regardless of specialism, should have opportunities to learn about and for sustainability (Tilbury and Cooke, 2002). The recommendations that followed from that Macquarie University summit “*Building Capacity for a Sustainable Future: Environmental Education-for-sustainability*” are listed in Tilbury (2004). The first of the eleven recommendations is: “Universities need to provide students with the critical, creative and future thinking skills needed to motivate and measure change towards sustainability issues.” Recommendation number ten states: “Universities need to offer opportunities for professional development of staff in education-for-sustainability” (ibid.:105).

The growing involvement by international universities is signaled by the fact that over one thousand university leaders (presidents, deans and provosts) have signed one or more of the international declarations that seek to promote sustainability in higher education, not only in terms of addressing their institutional environmental impacts but perhaps first and foremost in the way they equip students in dealing with sustainability issues (Corcoran and Wals, 2004, preface).

There are also growing numbers of environmental and social sustainability declarations that international universities support, including the Ubuntu World Forum of Civil Society Networks statements and the Earth Charter (2000), an important influence on the Plan of Implementation for the UNESCO Decade for Education on Sustainable Development. The Earth Charter (Appendix 2) is a widely recognised, global consensus statement on ethics and values for a sustainable future, a declaration of fundamental principles for building a just, sustainable, and peaceful global society for the twenty-first century.

In addition, there are growing numbers of consortia and individual university declarations of commitment to sustainability. While initially declarations may sometimes be political tokenism, their value can be considerable because they provide politicised opportunities for university staff, management and students to

question how universities are responding and adhering to their global or otherwise public commitment to sustainability.

Thousands more universities, including those in Aotearoa New Zealand, have yet to overcome the institutional barriers that work against change to meet the international challenge to re-orient their programmes. New Zealand universities have not yet committed publicly to providing substantive education-for-sustainability programmes, programmes that would provide opportunities for students, academics and researchers to play an important role in building capacity for ‘future-proofing’ this country as we move forward in the twenty-first century.

There do not appear to be any academic publications that focus on the deeper, underlying reasons (beyond the challenges, reported in Chapter Five and discussed in Chapter Seven), that many universities (including those in Aotearoa New Zealand) have failed to demonstrate significant progress in developing interdisciplinary or transdisciplinary learning programmes with a sustainability focus.

This thesis explores generic reasons for why New Zealand universities have not yet re-oriented educational programmes and practices to provide effective learning for addressing issues of sustainability and reveals key themes that help explain their limited progress towards this new educational paradigm.

1.5 The Current Situation in New Zealand Universities

The Ministerial foreword to the discussion document *Developing the Second Tertiary Education Strategy* (TES) for 2007-2012 states that the strategy “is a key document that sets out the government’s goals and priorities for New Zealand’s tertiary education system and is the reference point for the government’s policy-making, investment decisions and relationships with the sector” (Ministry of Education, 2006). Legal obligations stemming from the Education Act require the Tertiary Education Strategy to “set out the government’s medium to long term strategy for tertiary education, address the economic, social and environmental contexts and address the development aspirations of Māori and other population groups” (Ministry of Education, TES:4). It is also suggested that the new Statement of Tertiary

Education Priorities should “continue to set out a broad vision for the tertiary education system – a vision that sector stakeholders can readily identify with and relate to” (ibid.:4).

That vision could have been for a sustainable future for Aotearoa New Zealand, to align with the growing societal call for solutions to current non-sustainable environmental, social and economic practices and innovation and redesign for more sustainable social and environmental interactions (UNDESD, 2005). Instead the 2007 Tertiary Education Strategy (TES) strongly reflects the modern paradigm focus on economic growth, far more than the interconnectedness of social, cultural and environmental complexities that reflect the current and future needs of society this century.

In the previous 2002-2007 TES strategy, environmental sustainability was listed as one of the six national goals: however, as noted by the New Zealand Parliamentary Commissioner for the Environment (PCE, 2004:8) “although environmental sustainability is highlighted as a national objective ... it is largely absent from the rest of the document.” More recently, in an outcome evaluation of *See Change* the comment is made that “The (current, 2007-2012) Tertiary Education Strategy and Statement of Tertiary Education Priorities have been reviewed, and now include more opportunity for EfS [Education-for-Sustainability]”, though “[f]urther opportunities remain for progress in the tertiary sector” (PCE, 2007:5).

The PCE evaluation report expresses concern about the lack of implementation of education-for-sustainability and notes that “although the tertiary sector is expected to contribute to environmental outcomes, knowledge and learning for sustainability is absent from the list of priority outcomes for tertiary education; the priorities focus on economic growth” (PCE, 2007:23). Comparing the TES discussion document, the PCE evaluation of the TES strategies this decade, and the current 2007-2012 TES strategy leads me to suggest that little progress towards engaging in sustainability has been made in the years since 2004. Currently there appears to be a lack of tertiary ‘vision’ for a sustainable future, a focus that might give coherent meaning to all the fragmented policies and claims of ‘excellence’ and ‘raising achievement’.

In Chapter Eight I discuss the challenges and barriers that face the tertiary implementation of papers, courses and programmes, for a new way of thinking, particularly when national policies continue to use the language and paradigm of modern economic rationalism, compounding the non-sustainable issues we now face. My concern about the lack of sustainability education in New Zealand universities and the consequences of that lack is reinforced by personal debate and discussion with leading practitioners and academics in the developing field of education-for-sustainability.

The situation in 2004 (when I began this research) in New Zealand universities, as summarised by Chapman and Flaws et al. (2006), indicates a very low number of courses offering substantive learning about sustainability issues. Chapman and Flaws et al. argue that understanding the constraints and barriers within present educational frameworks needs to come before any education can result in sustainability education outcomes. A recent review of key relevant developments in tertiary education-for-sustainability in Aotearoa New Zealand (Stone and Baldoni, 2006) supports both this concern of Chapman and Flaws et al. and the findings from my research regarding the difficulties faced by universities. Stone and Baldoni provide a range of recommendations for both tertiary providers and central government, as discussed in Chapters Two and Seven of this thesis.

Lincoln University has recently established a sustainability focused Masters-level subject, 'Aspects of sustainability: an international perspective' (Buchan et al., 2007). Another degree is the Master of Planning Practice at the University of Auckland, which despite the limitations of the title, has a sustainability focus. Similar programmes are relatively few and appear to be possible because they are established within the post-graduate structure, where multidisciplinary is now more widely accepted. As discussed by Chapman and Flaws et al., and Stone and Baldoni, it is difficult to discern how effective these degrees may be in changing student behaviours toward becoming involved in actions for sustainability.

To date there is little evidence that New Zealand universities have adequately engaged with the international agenda of education for sustainable development, nor considered how best to meet the many challenges that face them when re-orienting

their research, teaching and learning to address future sustainability issues. Stone and Baldoni (2006) suggest that although aspects of bio-physical resource sustainability issues are explored in some university programmes, the human factors, including values and aspirations appear to have little coverage.

1.6 Research Goals and Aims

In this thesis I aim to explore key processes that enable successful implementation of education-for-sustainability in universities. I compare initiatives leading to the implementation of education-for-sustainability in international universities with efforts to do the same in Aotearoa New Zealand.

My goal is to develop theory that contributes to establishing substantive sustainability learning opportunities in universities in Aotearoa New Zealand. I explain why I chose to use grounded theory methodology, in order to reveal any embedded themes underpinning the breadth of variation in the interview data, leading to generating a theory to explain the initial research questions. The four research problems and subsequent research questions that formed the basis of my semi-structured interviews are described in detail in Chapter Four.

I explore how connections and relationships between university leaders for sustainability contribute to developing and implementing new sustainability learning initiatives. Analysis of the research findings, using grounded theory methodology, revealed key themes underlying the differences in opportunities for sustainability learning between international and Aotearoa New Zealand universities, leading to the theoretical development of my emergent model:

an active dendritic framework for university leadership for sustainability.

Actioning this framework enables connections and collaborations between individuals, across disciplinary boundaries and sectors of the university, leading to greater implementation of sustainability initiatives in universities. My proposed theory is implicit in the data, as well as grounded in the experiences of practitioners and participants in this research.

The reasons for low levels of sustainability learning in universities attract comment and academic debate but I am unable to find researched reasons for explaining why this currently remains the situation in Aotearoa New Zealand (Chapman and Flaws et al., 2006; Stone and Baldoni, 2006). I intend that my findings, theory and proposed theoretical framework will contribute to the debate, in academic and popular literature, of how to encourage, strategise for and support the implementation and embedding of learning for sustainability in universities.

1.7 Research Epistemology, Methodology and Methods

This research follows the general ‘grounded theory’ approach of Glaser and Strauss (1967), using an inductive strategy for generating and confirming theory, through constructive and interpretive analysis that leads to theory that emerges from the research. According to Patton (2002:128), grounded theory “is best understood as fundamentally realist and objectivist in orientation, emphasising the disciplined and procedural ways for getting the researcher’s biases out of the way but adding healthy doses of creativity to the analytic process”.

Grounded theory integrates both the objectivist approach to gathering data and an emphasis on understanding the data through interpretive methods, particularly constructive, inductive methods. This combination of objectivist and interpretivist paradigms is particularly relevant where a general theory is being inferred from multi-site particular instances, as explained in Chapter Four.

I chose to use a grounded theory approach because my research takes place across a number of disciplines, involves qualitative interviews and is seeking an emergent theory to explain an educational problem of low levels of learning for sustainability, in universities. This focus on sustainability sits within an ecological paradigm, congruent with the growing post-modern concern that previous modern thinking and subsequent human-centric activities have led to our current unsustainable use of natural resources. In addition, grounded theory methodology is not bound by either methods of data collection or discipline and is considered useful for multi-disciplinary studies and according to Charmaz (2006) grounded methods do not need to be tied to a single epistemology.

Grounded theory methodology provides a wide range of opportunities for interpretation, based on data and informed by experience, as well as by the possibility of emerging new understandings. These comprehensions also have the potential for developing theory that contributes to explanations for the phenomena being investigated. The development of inductive theory from qualitative inquiry processes is widely recognised as contributing to basic research (Charmaz, 2006; Glaser, 1992, 1998, 2005; Patton, 2002; Strauss and Corbin, 1998) as well as building knowledge through an applied research process.

My findings will contribute to knowledge and my theory provides a framework to support leadership efforts to establish learning for sustainability in universities.

1.8 Academic Applied Contributions of this Thesis

This thesis contributes to the growing body of academic literature, knowledge and understanding of the need for a new paradigm of learning, education-for-sustainability. In addition it touches on the role of communities of interest, professional academic clusters, change management and leadership styles most appropriate for enabling smooth transitions to change in universities.

These research findings fill a gap in Aotearoa New Zealand research and contribute to the growing academic discourse in educating for a sustainable future. My emergent theory – that connected, collaborative university leadership for sustainability enables education-for-sustainability in universities – led to developing a theoretical model, an *active dendritic framework for university leadership connection and collaboration*, that is useful for strategising and progressing learning for sustainability.

In addition I am contributing to the applied research field, providing links with case-studies of successful practices that can be used as inspiration, or adapted as appropriate by academics planning to attempt to develop or increase the capacity for learning about sustainability within their university courses.

1.9 Structure and Outline of Thesis

This final section of Chapter One provides an overview of the following chapters that comprise the body of this thesis.

In Chapter Two I provide the context for this thesis, by explaining how my life experiences influenced my choice of career, resulting in selecting education-for-sustainability as the focus of this thesis. I then discuss the development of environmental education terminologies, as societal understanding moved beyond the admittedly critical need to address environmental issues to include the social, cultural and economic issues within the context of sustainability. This led to using the terms education for sustainable development, then education-for-sustainability.

The literature review, Chapter Three, provides an overview of key contributions to the debate on the role and best practice of education-for-sustainability in higher education, the challenges met and the support structures needed, especially in universities. This review examines the role of transformative leadership, as it applies to the current call for education that explores environmental and social sustainability issues to be made available in university education. More of the literature that informed my understanding of the research findings, emergent themes and my theoretical model is integrated into discussions, where relevant, in later chapters.

Chapter Four outlines the grounded theory methodology approach used in this thesis and the reasons for interviewing academics both in Aotearoa New Zealand and in international universities which had substantive sustainability education programmes or courses. Details of my methodology, the theoretical underpinnings and the processes of analysis that led to my findings are described in detail. Constant comparison of emerging themes with findings and original data, coupled with the reflective extension of my findings revealed the underlying key themes that contributed to generating theory.

Chapter Five describes my research findings, resulting from formal interviews with thirty scholars that, together with my informal discussions with other participants, an extensive literature investigation and analysis of relevant university documentation

led to developing an understanding of *why* progress in learning for sustainability has been so slow in universities in Aotearoa New Zealand. My research identifies how, through engaging leadership support, some international universities have successfully overcome institutional barriers to providing education-for-sustainability.

When analysing the results a number of key interconnected themes emerged, including the importance of interconnected transformative leadership for initiating and supporting education-for-sustainability in universities. Relevant features of the role of leadership for initiating and enabling transitions in change, and how that relates to hierarchical or positional leadership for sustainability within universities is explored in Chapter Six.

I discuss how important that leadership is and describe how interconnected modes of leadership for sustainability emerged as key to integrating sustainability initiatives in universities. The connectedness of hierarchical positional leadership with lateral distributed leadership is noted, building on current knowledge and understanding of organisational leadership models. I explain the development of my theoretical model: *an active dendritic framework for university leadership for sustainability*, and suggest how my proposed model could be used to help overcome the perceived and actual barriers to transitioning to learning within a sustainability context in universities.

In Chapter Seven I discuss in more detail, the generic reasons why and how universities could be engaged in sustainability education, in relation to my findings and the literature. There are many contributions that a university can make to a sustainable future, especially through implementing learning for sustainability initiatives. I also examine the generic challenges and barriers to implementing education-for-sustainability initiatives, including the external political pressures, the influence of university, academic and student cultures and the effect of disciplinary silos on professional learning pedagogies. I explore the notion that there are key underlying challenges to a New Zealand university response and relate those to my findings and theoretical framework, supported by relevant literature.

The final chapter, Chapter Eight, is where I offer conclusions and explore the implications to universities of failing to adopt the international sustainable development agenda calling for the implementation of university-wide learning opportunities for present and future sustainability. I note that the lack of strong, authentic and credible visionary leadership for sustainability coupled with institutionalised managerial leadership in universities appears to be contributing significantly to why progress in the area of education-for-sustainability has been so slow. I offer recommendations, including using my proposed theoretical leadership model as a tool to increase connections and collaboration opportunities for university personnel to increase the implementation of sustainability initiatives that contribute towards cohesive sustainability education in the academy.

A glossary of terms is provided, after the contents and list of tables and figures, followed by a list of acronyms and their meanings.

Appendices provide factual background and supporting material that is pertinent to the call for further engagement by universities in education-for-sustainability, if universities are to be leading contributors to enabling societal transitions to a sustainability paradigm.

CHAPTER TWO

Setting the Context

Education, in short, is humanity's best hope and most effective means to the quest to achieve sustainable development.

(UNESCO, 1997)²

2.1 Introduction

There is a growing number of scholars, including Blewitt (2004, 2005, 2006), Fien (1992, 2002), Filho (1999, 2000, 2002, 2006,), Palmer (1998, 2003), Sterling (2001, 2003, 2006) and Tilbury (1995, 2004, 2005,) who argue that the inclusion of education-for-sustainability in both formal and informal education is essential for all learners. Education-for-sustainability has the potential to provide authentic learning experiences that will enable individuals and their communities to respond effectively to the rapidly increasing numbers of environmental and social issues in this twenty-first century. In addition, they will be more likely to engage in more sustainable practices, collaborate to design ways in which to adapt to or find solutions to impending challenges and contribute to a more sustainable future for those generations still to come.

According to many scholars, including Gough (1987), Fien (1993), Orr (1992), Sterling (2001) Robottom and Hart (1993) and Tilbury (1995, 1997, 2005) it is our previous and current lack of understanding of our complex ecological and human inter-relationships that contributes significantly to the reasons humankind now faces unprecedented (in documented human history) rapidly accelerating environmental changes. Orr, (1992), Sterling (2001) and Stone and Barlow (2005) argue that ecological literacy is an important core learning requirement, just as numeracy and

² United Nations Educational, Scientific and Cultural Organization (UNESCO). 1997. *Educating for a sustainable future: A transdisciplinary vision for concerted action*. EPD-97/CONF.401/CLD.1. Paris: UNESCO.

language literacy currently are for all students. Furthermore, given the challenges facing society now and in the predicted future Sterling (2001, 2003) has suggested that it is transformational education that is needed. Transformational teaching pedagogies assist learners to develop a range of critical thinking skills, through using inquiry learning processes and co-construction of knowledge involving collaboration and including authentic learning experiences. These will be critically important skills for developing adequate responses to sustainability challenges in the twenty-first century and beyond.

Education-for-sustainability is a holistic learning process, linking learning across environmental, social, economic and cultural dimensions so that students can acquire increasing understanding of the complexity of living within resource limits. The development of systems thinking skills, along with careful criticism of values and beliefs can lead to the cognitive changes necessary for developing sustainability outcomes for both individuals and wider society. These skills should be an integral focus of teaching and learning pedagogies across all educational sectors, particularly in post-school higher education (or tertiary education as it is known in Aotearoa New Zealand), and especially in universities, which are recognised as developing leading thinkers for society.

In this thesis I use the term ‘systems thinking’ in a postmodern sense, sharing the ‘context of inquiry’ with postmodern thinking (Montuori and Purser, 1996:185), acknowledging that systems are interconnected and interrelated in a plurality of ways. Boundaries assigned to any part of a holistic ‘system’ are simply heuristic, rather than knowledge limiting, recognising that knowledge will always be incomplete, while seeking to explore certain aspects of the whole.

In this chapter I ‘set the scene’ by tracing recent changes in the focus of education for environmental sustainability, from environmental education to my preferred terminology: learning for sustainability. As part of establishing the context for my research I explore the current conditions that influence learning for sustainability in

society, schools and universities before examining, briefly, the level of political support for sustainability learning initiatives in Aotearoa New Zealand.

2.2 Setting the scene ... personal background

For my first twenty years I lived in a small, slowly expanding semi-rural town in the South Island (Te Wai Pounamu) of Aotearoa New Zealand, a town that is located within biking distance of hill side forests, a mountain catchment river and ocean beaches. The townspeople and their activities are integrated closely with the surrounding agricultural community and at that time, everyone had some links to local farming and access to recreational spaces. I revelled in taking any opportunities for experiencing the natural environment, enjoying exploration and new challenges with family and friends in a stable, supportive, community environment.

This ‘Kiwi childhood’ of helping on farms, walking in southern indigenous forests, swimming, fishing, playing sports and reading widely - all influenced my choice of a science degree, majoring in Zoology - where I learned how to use positivist, reductionist research methods (on hapless marine organisms) as well as developing knowledge and understanding of ecological systems. In addition I took part in cognitive research projects in psychology, field studies in geology and trained as a science teacher. These experiences began shaping my desire to help others understand the basic importance of ecology and the need for better understanding of both human relationships and their impacts on our planet.

From the early 1980s, while working as a teacher of teenagers and young adults I have recognised the value of environmental education – for sustainability – teaching in educational programmes, at all levels of formal and informal education, including education-for-sustainability initiatives for businesses and organisations.

On a beautiful day in Aotearoa New Zealand, with clear skies, ready access to drinking water and surrounded by a natural and relatively uncrowded built environment, it is easy to forget that billions of people in the world face a totally different reality (IUCN, 2006; UNEP, 2005; UNESCO, 2007). They face water contamination or shortages, or poor health due to polluted water or air and soils, or food shortages resulting from increasing droughts or storm events, or lack of shelter and food and jobs due to civil, ethnic and religious wars.

For several decades the effects of people's disconnection from and the impacts of their actions on the land have concerned writers as influential as Wendell Berry (1987), Loren Eiseley (1969), Aldo Leopold (1968), Henry David Thoreau (1854/1995) and many others. These writers (among others) informed my understanding of international environmental sustainability issues and contributed to my awareness of similar though less obvious issues in Aotearoa New Zealand.

Increasing evidence of global and national environmental and social problems, often resulting from a lack of understanding of cumulative effects and the connectivity of ecological systems eventually led to a much wider debate across society, exploring how to address these environmental problems. As societal awareness of the causes and impacts of environmental pollution increased, fueled by Rachel Carson's (1962) *Silent Spring*, so did deeper understanding of the social equity issues resulting from both environmental impacts and an inequitable distribution of biotic and physical planetary resources. Evidence mounted of the compounding negative effects of human impacts on our planet's life-supporting ecosystems, there was a rapid rise in societal concern about the long-term effects of current human practices. As understanding developed and knowledge was shared across communities and nations, the education for environmental sustainability debate grew, from initial efforts to re-connect students and their communities with their natural environment, through nature and conservation education to environmental education (Fien, 1993, 1998; Huckle, 1993; Huckle and Sterling, 1996; Jickling, 1992; Orr, 1992; Sterling, 1996a, 2001). Environmental education initiatives broadened to investigate the interrelationships between people's social, cultural and economic actions and how these both influenced and were supported by their biophysical environment.

Increasingly, academics (Filho, 2000, 2002; Flannery, 2005; Hawken et al., 1999; Hawken, 2007; Orr, 1992, 1994, 2004b; O'Riordan, 1989, 1994; Porritt, 2005; Sterling, 2001, 2003), communities of researchers (MEA, 2006) and concerned groups in civil society (IUCN, 2006; UNESCO, 2007) are exploring the possibility that humankind is impacting on the earth to such an extent that current generations and their children will face major sustainability challenges by the middle of this century.

Their discussions range from what is happening, what caused it to happen and, importantly, what new learning and different practices need to be undertaken to meet both present and future social and environmental sustainability challenges.

2.3 Changing terminologies and focus of EFS

Since the Stockholm Declaration (UNEP, 1972) (adopted at the 1972 United Nations Conference on the Human Environment) called for environmental education for all people from grade school through adulthood, the definitions and explanations of what environmental education means have continued to evolve. Despite the original explanation, given in the 1977 Tbilisi Declaration (UNESCO-UNEP, 1978:8) that a goal of environmental education is “to foster clear awareness of, and concern about, economic, social, political, and ecological interdependence” (see Appendix 3), many interpreted environmental education as primarily or solely concerned with environmental sustainability. This focus may have reflected the still-growing societal concern, as evidenced by Rachel Carson’s (1962) seminal *Silent Spring*, which exposed the enormity of pollution related environmental issues.

Subsequently there have been shifts in the breadth of meaning of environmental education leading to the terminologies I am choosing to use: education-for-sustainability (EFS) and learning for sustainability. Education-for-sustainability implies that learning will result in improving sustainability practices now, as well as for the future. Teachers and researchers, including Law (2003), Fien and Tilbury (2002), Orr (1992, 1994, 2005) and Sterling, (2001, 2003, 2006) suggest that ‘learning’ implies all our learning that takes place in both informal and formal education settings and the use of the term ‘education’ implies learning that takes place in a formal teaching situation, usually aligned to a teaching programme.

Orr (1992, 1994) favours ‘ecological education’ to incorporate the understanding that we depend on our ecological systems for life, with all aspects of our social and economic lives being interconnected, as are all ecologies. Orr argues that we are interconnected with and depend on ecological systems, and that this learning should be at the heart of our education. Because this thesis focuses on university-level ‘education’ processes and practices, rather than individual learning I have chosen to

use the term ‘education-for-sustainability’, intending to indicate that ecological education or ecological literacy (Capra 1996, 2005; Stone and Barlow, 2005), also referred to as eco-literacy (Orr, 1992), should be an integral learning focus within the education-for-sustainability concept, as discussed in Chapter Six.

A concurrent term, education for sustainable development, was first used in an international institutional sense at the United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro in 1992, where environmental education was stated to be a key factor in responding to global concerns about the state of the environment. This conference, informally referred to as the Earth Summit, adopted an action plan to meet the global challenges of sustainable development. Chapter 36 of Agenda 21 identifies four major thrusts of education for sustainable development (ESD).

1. The promotion and improvement of basic education.
2. Reorienting existing education at all levels to address sustainable development (in each of the realms of social, environmental and economic sustainability).
3. Developing public understanding and awareness of sustainability.
4. Training (of all sectors of the workforce who contribute to local, regional and national sustainability)

The concept of education for sustainable development is explained in UNESCO, *Education-for-sustainability – from Rio to Johannesburg: Lessons Learnt from a Decade of Commitment*, (2002:5) as a “dynamic concept that encompasses a new vision of education that seeks to empower people of all ages to assume responsibility for creating and enjoying a sustainable future”. Following the World Summit for Sustainable Development (Johannesburg, September 2002), the term “sustainable development” became more widely used for focusing on the fact that there are three major spheres of sustainability concern, namely – environmental, social and economic arenas. Culture may be considered either separately, or as part of the social sphere, depending on the focus of the community involved in the dialogue and actions for sustainable development.

In the World Commission on Environment and Development (WCED) report entitled *Our Common Future* “sustainable development” was described as “...development that meets the needs of the present without compromising the ability of future generations to meet their own needs”. It contains within it two key concepts: the concept of the ‘needs’, in particular the essential needs of the world’s poor, to which priority should be given; and the idea of limitations imposed by the state of technology and social organization in the environment’s ability to meet present and future needs.” (WCED, 1987:43)

At the World Summit for Sustainable Development, in recognition that education for sustainable development had not become the educational focus envisaged at the 1992 Earth Summit, a proposal was forwarded to the United Nations initially requesting a decade of ‘education-for-sustainability’ to draw attention to the need for countries to develop and implement strategies for sustainable development. Resulting debate and discussion in the United Nations noted that the sustainable development term was being used by UNESCO and appeared a better ‘fit’ with the global Millennium Development Goals (see Appendix 4). The decision was made to use the term ‘sustainable development’, and on the 20th of December 2002 the United Nations Assembly adopted Resolution 57/254 - for a United Nations Decade of Education for Sustainable Development (UNDESD) from 2005–2014. The designated lead agency is UNESCO, which promotes and advocates for improved quality of teaching, including, as one of the four main objectives of the UNDESD to ‘Foster an increased quality of teaching and learning in education for sustainable development’.

Clearly there is international recognition of the critical role of teaching and learning for moving towards more sustainable development. Educating for sustainability can take place in all learning areas, and the initial focus will depend on student learning needs, social and cultural expectations and local issues. Many ‘sustainable development’ teachers intentionally focus on the social sustainability issues of equity, justice, peace and cultural problems in order to facilitate learning about holistic sustainability issues. Others focus on environmental problems that affect students and their communities, moving seamlessly to exploring the inter-relationships between social, environmental and economic sustainability issues.

The International Conference on Environment and Society: Education and Public Awareness for Sustainability, organised in Thessaloniki by UNESCO and the government of Greece to celebrate the 20 year anniversary of Tbilisi, unanimously adopted a Declaration of Thessaloniki (UNESCO-EPD (1997). Knapp (2000:32) comments that only two of the 29 statements in the declaration use the term 'environmental education' and concludes that the document became a "charter on the future of education-for-sustainability". Knapp argues, as a supporter of the term 'environmental education' with its focus on "developing skills and attitudes necessary to understand and appreciate the inter-relatedness among man, his culture and his biophysical surroundings" (IUCN, 1970), that there are risks in subsuming the name and concept of environmental education into educating for sustainability.

However, according to Tilbury (2004:98) theorists and practitioners alike are extending the concept and term of environmental education and increasingly using the phrase 'environmental education-for-sustainability' or 'environmental education for a sustainable future'. These developing terms appear to indicate a shift in understanding from a perceived environmental education focus on current human inter-relationships with the environment towards a wider conceptual understanding of the inter-relatedness and complexity of all societal interactions with our environment.

I suggest that the terms 'sustainability' and 'sustainable futures' terminologies are more holistic in meaning and provide some degree of distance from the contextual way that the term 'development' is often used, particularly by orthodox economists. Herman Daly (1996:167) argues against the conventional economic assertion that the goal of social 'development' can be met by increasing the consumption of goods and services, in effect 'growing the economy' and measuring progress with the economic gross domestic product (GDP) figures. Daly draws distinct differences between 'development' and 'growth', pointing out that "a child grows and develops simultaneously; a snowball or a cancer grows without developing; the planet Earth develops without growing. Economies frequently grow and develop at the same time, but can do either separately." Daly further maintains that "Sustainable development is development without growth in the scale of the economy beyond some point that is within biospheric carrying capacity."

Despite rapidly increasing resource depletion and increasing negative impacts of such progress, the costs of rising levels of environmental degradation are not currently factored into economic monetary calculations of the 'health of the economy'. Nor is 'quality of life' given a corresponding value, despite the evidence that, beyond a certain level, rising GDP is not reflected by increasing quality of life, as perceived by members of human society. Life Satisfaction figures from Britain and Europe reflect this conundrum (Porritt, 2005:52) and similar results are available for Japan and "could be drawn for other rich countries" (Hamilton and Denniss, 2005:64).

Internationally, the term 'education for sustainable development' continues to be used, for reasons including those outlined earlier in this chapter and in particular to align with the current United Nations Decade for Education for Sustainable Development. Sustainable development is recognised by international organisations such as UNESCO (2002) and the IUCN (2004) as the journey into the future, a process of continual learning for all whether focusing on sustainable 'development', sustainability, or a more sustainable future.

Some educators favour the term 'learning for sustainability', or 'learning for a sustainable future' while others prefer 'teaching for sustainability', or 'teaching for a sustainable future'. The latter term is one that I have reservations about using, as I concede that it can be interpreted as favouring long term planning for action - in the future - while discounting the urgent need for immediate action to begin altering our present unsustainable practises. Also, I prefer to use the word 'learning' because I believe that we all are learners, whether teachers, lecturers, facilitators or students, co-creating knowledge and acting collaboratively for a more sustainable world.

However, when discussing pedagogies that aim to enable such learning, I have chosen to use the term 'education-for-sustainability' in an effort to engage those teachers who see themselves principally as educating others.

The continued, varied and extensive level of debate about what is meant by the terms sustainable development, sustainability and sustainable futures demonstrates that

these definitions remain contested, but does not affect the understanding (from the level of the United Nations to community groups and individuals) that these are desirable concepts (McKeown and Hopkins, 2003) and that, “to use a business analogy, sustainability is an established ‘brand’ that has wide recognition” (Adams, 2006:10).

Despite the many slightly different meanings ascribed to sustainability none are effectively incorrect, as long as they aspire to a sustainable future rather than an unsustainable one. I will primarily use the terms education-for-sustainability and learning for sustainability, interchangeably, in this thesis. I mean that student learning for a sustainable future is the preferred outcome, whether using formal education pedagogies or enabling individual student learning through informal means.

2.4 Education-for-sustainability in Aotearoa New Zealand

2.4.1 Education-for-sustainability across Society

There are many examples of a range of sustainability learning initiatives across many sectors of society, many organised and supported by non-governmental organisations (NGOs), for example WWF (New Zealand) and Royal Forest and Bird Protection Society (New Zealand), which have extended their programmes to include broader sustainability issues in relation to conservation concerns. The Ministry for the Environment continues to support community programmes that have an environmental focus, including providing some guidance and resources for raising awareness of waste disposal and global warming issues. Recently, the Department of Conservation has extended the scope of conservation education programmes by partnering with specific school-based experiential programmes, linking to wider sustainability issues encountered in community conservation efforts.

Many regional authorities and city councils promote and manage a wide range of environmentally focused programmes that are usually theme- or topic-based, and aimed at all rate-payers. Examples are water, waste and recycling programmes that have the potential to be linked to wider sustainability issues, and this is increasingly possible as more schools and more communities become engaged in finding

solutions to unsustainable practices. In addition, many councils (for example Auckland Regional Council, Environment Canterbury, Environment Waikato and Greater Wellington) employ educators to assist school teachers and citizen groups to integrate learning, through involvement and action for sustainability issues that affect local citizens, for example polluted waterways, forest clearance (especially in river catchments), and storm water management (Greater Wellington Regional Council, 2004).

A small number of programmes are holistic and wide-ranging in their sustainability learning intent, for example the Sustainable Living Programme, supported by local authorities, with a focus on community and school learning and The Natural Step Foundation, Aotearoa New Zealand (TNSFANZ), a national foundation within the international The Natural Step network, which works with business and organisations to learn about and adopt more sustainable operational practices (Nattrass and Altomare, 1999). There are a few professional bodies including the New Zealand Society for Sustainability Engineering and Science (NZSSES), and national support networks including the New Zealand Association for Environmental Education (NZAEE), the New Zealand Business Council for Sustainable Development (NZBCSD), the Sustainable Business Network (SBN) and the practitioner network Sustainable Aotearoa New Zealand (SANZ), that provide learning opportunities in and across specific sectors, through conferences and seminars aimed at raising awareness and seeking solutions for sustainability issues. Most of these initiatives are relatively small, and depend on membership levies and securing contestable funding to fulfil their goals.

Growing societal concern and the desire to adopt more sustainable practices are reflected in the media, through increasing numbers of debates and reports featured on television and radio, and in magazines and daily papers of how we should be acting to reduce the impacts of sustainability issues, particularly those linked to global warming and climate change. Some recent examples, initiated during 2007, include the TV3 series 'Wa\$ted', the *New Zealand Listener's* introduction of a monthly "Ecologic" page, regional newspaper *The Dominion Post's* weekly "Green Zone" page and Radio New Zealand National's broadcasts of environmental programmes

and repeat-broadcasts of a number of sustainability forums (including the New Zealand Parliamentary Commissioner for the Environment's PCE20 Forum held in March 2007). This increasing societal concern is yet to be explicitly reflected in formal education.

2.4.2 Education-for-sustainability in Schools

In Aotearoa New Zealand, state-funded education is compulsory until the age of sixteen, when a minority of students leave formal schooling. Ussher (2007) reports Ministry of Education figures showing that 29% of students leaving secondary school in 2004 transitioned to tertiary bachelor-level study by 2006, from a total of 62% of school leavers entering a range of tertiary study options at that time. These options include diplomas, trade certificates and a range of private provider qualifications. The sustainability-literacy levels of incoming students need to be understood, in order to develop appropriate university-level learning for sustainability that meets their needs as citizens of the twenty-first century.

Currently the implementation of education-for-sustainability differs considerably between primary, secondary and tertiary institutions. The most substantive national school-based initiative is the Enviroschools programme, a holistic sustainability learning programme, operating with trained educational facilitators who work with classroom teachers (and school management and community) to focus on learner-centred pedagogies that encourage students to choose issues that concern them, then take appropriate actions for a more sustainable future.

Enviroschools was developed in the 1990s, by Hamilton City Council, then became established as a national programme, under the umbrella of the New Zealand Environmental Education Association (NZAEE), using funding initially sourced from contestable sustainability management funds managed by the Ministry for the Environment. Currently the Enviroschools Foundation operates as a charitable trust, partnering with local government councils who fund Enviroschools facilitators to work with teachers within schools. The Foundation secures funding from business sponsorship to operate the national office and since 2007 has operated with assistance from a three-year contractual grant from the Ministry of Education.

Increasing numbers of schools, from three in 1993 to over 520 in December 2007, seek to be part of the Enviroschools programme, either through whole school facilitated sustainability programmes or along a linked pathway - the Enviroschools Awards. The latter (developed by Auckland City Council and now part of the Enviroschools Programme) often is a first step towards more in-depth learning (Enviroschools, 2007). Facilitated programme numbers are restricted only by the number of regional and local councils who see the need and appreciate the value of supporting learning for sustainability, having sustainability-literate rate-payers and have the financial capacity to train facilitators. Most facilitated Enviroschools are small schools and the great majority are primary schools.

Currently, a relatively small number of secondary schools are attempting to integrate some aspects of sustainability into existing programmes, through topics or units of work. Rising numbers of secondary schools use the Enviroschools Awards as a way to grow understanding of sustainability issues within the school.

The *Guidelines for Environmental Education in New Zealand Schools* (Ministry of Education, 1999) state in the preface that any environmental education teaching in schools is dependent on the governing body of the school, the elected Board of Trustees. Consequently environmental education has struggled for acceptance, because there is no actual Ministry of Education mandate for educating for sustainability.

School education-for-sustainability initiatives have slowly increased this decade, due to funding leveraged by the Green Party in return for politically supporting certain policies of the current Labour Government. This resulted in the Ministry of Education establishing a 2002 contract to train a national team of school advisers for environmental education. Currently these 18 advisers are based in colleges and faculties of education within universities and provide teachers with professional development for Education-for-Sustainability (EFS), as well as working with teachers in schools, and other environmental education providers, to assist them in integrating environmental education-for-sustainability into their class programmes.

Further political leverage in 2006 resulted in the Ministry of Education increasing funding for the National Education-for-sustainability (NEFS) contract, for 3 years, providing start-up funding for Te Mātauranga Taiao, the new Te Reo/Māori education initiative for sustainability, and providing contractual support for the well established Enviroschools programme. Continued advocacy for EFS, examples of good learning-centred teaching practice and positive community feedback have resulted in more schools seeking support from Enviroschools and the NEFS coordinators.

With the November 6th, 2007 release of the revised *The New Zealand Curriculum*, it is anticipated both secondary and primary schools will respond to improved guidance and increasing opportunities for integrating learning for sustainability into school programmes. The curriculum presents eight key principles to underpin all school decision-making (Ministry of Education, 2007:9). These include a ‘Future focus’, encouraging “students to look to the future by exploring such significant future-focused issues as sustainability, citizenship, enterprise and globalisation”. The revised curriculum includes ecological sustainability, equity, community and participation and globalisation as explicit values to be encouraged, modelled, explored and expressed in student learning (ibid.:10).

Furthermore, six Education-for-Sustainability (EFS) Level Two Achievement Standards have been developed, for use and assessment within the National Certificate of Educational Achievement (NCEA) system. These and future EFS Achievement Standards will offer secondary schools assessment specific teaching and learning modules with a context of sustainability, to complement the integrated opportunities already developed by relatively few secondary schools (Bolstad et al., 2004). However, there is still no indication of any Ministry of Education initiatives to encourage opportunities for sustainability education training for pre-service or in-service teachers.

Consequently there is some distance to travel before sustainability education in Aotearoa New Zealand reaches levels comparable to some international education-for-sustainability initiatives. Certainly, some international academics express great

surprise that education-for-sustainability is not as strongly advocated for, or mandated, in Aotearoa New Zealand as it is in some other developed countries (several personal communications with conference participants and visiting scholars). ‘Why not?’ is the question that started my research journey, one that became increasingly focussed on uncovering reasons for the lack of education-for-sustainability in university education.

2.4.3 Education-for-sustainability in Universities

Stone and Baldoni (2006) collected data from New Zealand University websites for the Parliamentary Commissioner for the Environment’s (PCE, 2007) review of New Zealand’s progress towards sustainable development. They found 68 university programmes, from diploma to Masters level that could be expected, from their title, to include content relevant to sustainable development. This shows an increase from 46 ‘courses’ ranging from programmes to modules, identified in 2004 as “including the word sustainability (or similar) in the title” (Chapman and Flaws et al., 2006:288).

Because there is no definition of what is covered by either a course or programme, it is not possible to compare accurately the numbers given in these papers. Nor is there any opportunity to compare or comment on the quality of those programmes (or courses) cited, because the studies are not concerned with the quality of sustainability knowledge or pedagogy in programmes. Chapman and Flaws et al. (2006) suggest the 46 examples demonstrate a low level of uptake, rather than a commitment to sustainability across the university sector.

It is possible that any subsequent increase in figures may indicate slightly more engagement with learning for sustainability. However, as noted by Stone and Baldoni (2006) the extent of how holistic or transformative any programme outcomes are remains difficult to determine, even where titles of some courses within a programme do indicate interdisciplinarity, an essential component for an authentic sustainability programme, as discussed in Chapter Seven. In this thesis my focus is on the presence of sustainability teaching and learning initiatives, while acknowledging the need for further research to assess the quality of education-for-sustainability programmes.

In the tertiary sector, there are only two ‘dedicated’ EFS courses for training pre-service teachers to use sustainability contexts, with appropriate collaborative, learner-centred, future-focused pedagogies that enable students to take positive action for a sustainable future. Since 1987 the former Christchurch College of Education, since merged with the University of Canterbury (in 2006) has offered optional semester courses that prove increasingly popular with pre-service teacher trainees. More recently Waikato University has developed and offers a half-year Environmental Education paper that is compulsory for all first year Bachelor of Teaching students.

Within Aotearoa New Zealand there are recent examples of universities developing new environmental management policies and starting to implement more sustainable operational practices (as discussed in following chapters). In universities overseas, these practices include a widening range of initiatives, for example reducing carbon emissions, energy and water resource use, disposing of waste in an environmentally sound way, reducing or improving biodiversity on the campus by appropriate landscaping and even providing food that is locally grown and pesticide free.

In academic and higher education management sector literature, the descriptor ‘greening the campus’ is commonly used to refer to improving operational practices and general management systems to include more sustainable practices. Many of these practices are initially as basic as setting up paper recycling, setting printers to double-sided default printing and replacing light fittings with more energy efficient bulbs. Where there is a coherent sustainability goal, more integrated sustainability and linked research-based learning practices are established.

As I discuss in Chapter Seven, improving university sustainability practices is integral to supporting environmental awareness-raising and ‘greening the curriculum’. Student understanding about operational sustainability issues (from propositional knowledge) is enhanced and deepened if they can see and experience sustainable practices. If there is a university-wide vision of more sustainable practices and a goal of better management of environmental issues, then, I suggest, it is easier for staff and students to participate in those practices, particularly if they

recognise individual life-style benefits from creating a more sustainable future. The value of teaching pedagogies being linked to experiential learning opportunities within a sustainability context is important for authentic learning for sustainability.

Andrew Stables (2001) points out that anyone committing to education-for-sustainability assumes that pedagogical changes can result in reducing practices damaging to the biosphere. Other researchers debate the merit of integrating educational pedagogies, wherever possible, to facilitate learning within the context of sustainability, contending that it is too difficult to do so within institutional structures.

I argue that is not necessarily so, as demonstrated by hundreds of examples of successful learning within a context of sustainability, as revealed by the increasing numbers of higher education case studies referred to in academic literature and a range of conferences with a sustainability focus. Bartlett and Chase (2004), Filho (2002a, 2002b), Palmer (1998), Thompson (1997) and Tilbury et al. (2005) have all collected sustainability learning case studies from across a range of university disciplines. Tilbury et al. (2005) describe a growing number of innovative ways that universities have strategised to provide better learning for sustainability opportunities for their students. In all instances pedagogical changes have been key to enabling new ways of learning for the future.

Kates et al. (2001) discuss the emerging role of sustainability science as a new focus for universities and the challenges this faces because of cultural and academic challenges to the changes in teaching practice that this new focus requires. Adams (2006:14) comments succinctly that “‘dismal science’ in all forms remains essential in charting a course to the future” and rightly points out that it is not enough, as it is practiced, to drive the changes needed. Knowledge is always a key factor when making informed decisions that will lead to envisaged outcomes. However, knowing information does not necessarily change much, particularly if learners are not ‘engaged’ in contextual learning. Furthermore ‘knowing’ can even hinder rational decisions when people do not understand that one can never know everything (Palmer, 1998).

Education involving appropriate learning pedagogies (as discussed in Chapter Seven) is needed to engage learners in understanding their dependence on healthy functioning ecosystems and equitable access to those ecosystems, leading to acting in ways that value sustainable practices. Ironically, universities around the world profess that they seek and have a particular responsibility to provide the teaching and learning of the professionals who will occupy key positions of decision-making in the future. Yet, questions remain about the numbers and place of specific teaching and learning programmes that have, as their intent, improving understanding and empowering student action for a sustainable future.

In Chapter Seven I discuss the external factors and societal expectations by which universities are likely to be influenced as they assume their role as leaders for change that enables meeting the challenges of the twenty-first century. I argue that it is time for universities in Aotearoa New Zealand to make a strong commitment to this learning journey towards a sustainability paradigm, learning from international successes and strategising how best to achieve changes in their institution.

The role of effective, connected transformative leadership will be critical to engaging academics and general staff, while building opportunities for collaborative learning for a sustainability paradigm, in all sectors of the university.

2.5 Political support for Sustainability Initiatives in Aotearoa New Zealand

Aotearoa New Zealand's political interest in pursuing environmental and social sustainability goals is demonstrated by the signing of and support for many international treaties with strong environmental and social development goals. Aotearoa New Zealand is a signatory to the United Nations Millennium Development Goals (MDGs) (see Appendix 4) with its strong focus on healthy and socially equitable sustainable development; a party to the 'Convention on Biodiversity'; and has ratified a number of international treaties, including the 'Kyoto Protocol' – an agreement for reducing green house gas emissions effecting global warming. These political actions have stimulated an increase in university research in the areas of social development, biological conservation and aspects of climate change.

Of particular note is the fact that Aotearoa New Zealand was a leading contributor to promoting the United Nations Decade for Education for Sustainable Development (UNDESD) under the lead agency of the United Nations Educational, Scientific and Cultural Organisation (UNESCO). Internationally, UNDESD was officially launched on the first of March, 2005 and the New Zealand launch took place soon after, on the fifth of March, 2005. Despite this contribution, the result of collaborative efforts from a range of organisations committed to a vision of sustainability, political support for UNDESD was minimal. For example, there was no formal *New Zealand Education Gazette*³ comment about both the launch and the opportunities for education for sustainable development until mid 2005. UNESCO New Zealand, hosted by the Ministry of Education but poorly funded and resourced, continues to seek more support and capacity for opportunities to assist the goals of the UNDESD, goals that include education-for-sustainability and sustainable development across all sectors of society.

Surprisingly, New Zealand still lacks a national policy for sustainable development for a sustainable future, despite the current Prime Minister's aspirational statements to Parliament on 13 February, 2007 that: "New Zealand can aim to be the first nation to be truly sustainable – across the four pillars of the economy, society, the environment, and nationhood." A further statement, "I believe we can aspire to be carbon neutral in our economy and way of life" led to her comment that the government intends to lead by example in the area of carbon neutrality, naming six government departments being charged to showcase operational changes that deliver more sustainable outcomes.⁴

With sustainability-focused statements like these, there appears to be an imperative to increase the levels of 'strong sustainability' learning across leading institutions and organisations in Aotearoa New Zealand. But, without deep, connected understanding of the systems complexity of the inter-relationships between humans and their supporting ecosystems it is more likely that efforts to reach authentic

³ The New Zealand Ministry of Education's magazine, a nationally disseminated information source, including notices to the educational sector and comment on current educational initiatives, educational research and teaching courses and education vacancies.

⁴ Rt Hon H Clark (13 February 2007) 637 NZPD 7237.

sustainable outcomes will result only in mitigation of negative environmental effects without launching the paradigm change needed to reach a sustainable future. In effect, society remains operating within a ‘weak sustainability’ paradigm.

The Ministry for the Environment is responsible for the Sustainable Development Programme of Action (SDPOA) (Department of Prime Minister and Cabinet, 2003), an initiative that focuses on four strategic issues; Sustainable Cities, Energy, Quality and Allocation of Fresh Water, and Investing in Child and Youth Development. According to the review of the SDPOA, by Landcare Research (Frame et al., 2006:28) international agencies consider that New Zealand has established a national strategy, in the SDPOA. However, the SDPOA created in 2003 must be seen for what it is: a programme of action, focusing on four easily identified areas of concern and building on investigative programmes already in progress, rather than a cohesive national strategy.

Of pivotal interest in the Landcare Research review are those factors identified as “most likely to enable New Zealand to move effectively towards sustainability” (ibid.:59). The factors listed below, and expanded upon in the review are:

- political leadership,
- governance – for changing to new paradigms,
- processes – including adaptive learning,
- tools and methodologies,
- capacity building, benchmarking, and
- research – with a focus on the link between policy and delivery.

The question remains, how easy will it be to move to sustainability when the present leaders of business and organisations have been educated in and continue operating in an unsustainable paradigm? Making the transition from business-as-usual, with some increasing efforts in short-term mitigation to an innovative, re-designed future focused sustainability paradigm will need significant opportunities for co-learning and collaborative planning across all sectors of society. Transformational leadership (as defined and discussed in Chapter Six) will be critical, if Aotearoa New Zealand is to achieve enough changes in practice to meet increasing environmental and social challenges.

The New Zealand Parliamentary Commissioner for the Environment comments, “It is urgent to address how we, as a nation, can create institutional settings from which sustainability leadership can emerge in ways that empower our Parliament to facilitate the needed policies” (Frame et al., 2006). I argue that there are numerous opportunities for universities to step forward and show leadership by modelling how to implement education-for-sustainability in an institution operating within a sustainability paradigm.

As the literature review describes and my research findings confirm, there are increasing numbers of examples of good practice education-for-sustainability initiatives operating in a wide range of international universities. Underpinning the success of these initiatives is the active support of effective university leadership for sustainability.

2.6 Leadership for sustainability

Prior to this research my understanding of leadership was strongly influenced by observing leaders and practising leadership in a variety of community groups and educational organizations. My experiences ranged from ‘leading’ new initiatives in local and regional committees, working as an advocacy ‘leader’ behind the scenes, leading projects from elected positions in regional and national organizations, and being president of a national organization, for six years. More recently, further opportunities to observe a wider range of leadership practice have arisen, mainly related to my professional work as an adviser and facilitator for establishing learning for sustainability initiatives in organizations with educational goals.

Leadership for sustainability, as revealed in the research data and supported by literature, is the key focus of this thesis, leading to generating a theoretical framework for enabling connections and collaborations between hierarchical and distributed university leaders for sustainability. In Chapter Six, I explore leadership for the future and describe the development of my theoretical model: *an active dendritic framework for university leadership for sustainability*.

2.7 Summary

In this chapter I have explained the context for the focus of this research, as influenced by my life experiences and emotional connection to our natural environment. I have described how there has been a change in education terminology, from nature education through environmental education to education-for-sustainability, in response to new understandings of the connections between people and their life-giving ecosystems. I also explored the ways in which education-for-sustainability is presently manifested within society, schools and universities in Aotearoa New Zealand and commented on the current levels of political support for national education-for-sustainability initiatives.

In Chapter Three I use my Literature Review to engage with the increasing numbers of academic contributions examining and debating both the challenges to and the development of education-for-sustainability programmes within universities. I discuss the philosophical literature that supports my theoretical understandings of education-for-sustainability and briefly examine the literature surrounding qualitative methodology, as it relates to my choice of using grounded theory for this thesis research.

Lastly, but most importantly I explore aspects of leadership, as they relate to transformative change, for enabling further implementation of sustainability learning initiatives in universities. In later chapters I engage with further literature pertinent to my research methodology, leadership for sustainability and challenges to and initiatives for learning for sustainability.

CHAPTER THREE

Literature Review

The problems that exist in the world today cannot be solved by the level of thinking that created them.

Alfred Einstein (1879–1955)⁵

3.1 Introduction

The literature regarding education-for-sustainability has shown interesting trends in both focus and terminology, as could be expected in a new and rapidly developing field of scholarly learning. Since the 1980s there has been a steady increase in the number of published papers that address a range of issues surrounding educating for sustainability, in higher education, particularly in universities. Exploring these publications reveals a shift in contributors' focus and concerns, as discussed below, and confirms the nature and importance of education-for-sustainability.

Papers written during the 1980s use the terminology and concept of environmental education (Hungerford et al., 1980; Fien, 1988) and express concern about the lack of quality of such education. Contributing scholars advocate for and discuss the value of the different environmental education teaching and learning pedagogies used in some tertiary institutions.

In the 1990s growing numbers of contributions reflect the developing debate about the merit of different philosophies (and frameworks) underpinning environmental education (Fien, 1993, 1998; Huckle, 1993; Huckle and Sterling, 1996; Jickling, 1992; Orr, 1992; Sterling, 1993) and by the late 1990s an increasing body of literature focuses on 'education for sustainable development', using this term to move beyond perceived limitations of the term 'environmental education' (Sterling, 1993, 2001; Tilbury, 1995). According to Tilbury the developing, more holistic notion of education-for-sustainability is "reflected in the broadening nature and

⁵Einstein, A. Retrieved on July, 12, 2007 from <http://www.quoteworld.org/quotes/4222>

scope of environmental education, marked by moves towards an inter-disciplinary dimension and from a more local to global approach” (ibid.:196).

During the late 1990s and into the twenty-first century, the debate continues and in an apparent effort to avoid arguments about what is meant by ‘sustainable development’, increasing numbers of formal and informal education groups are using the term ‘education-for-sustainability’ as used in Agenda 21 (Huckle and Sterling, 1996; Sterling, 1998; Tilbury, 2001, 2004a, 2004b, 2005), or ‘education for sustainable futures’.

These evolving changes in terminology reflect different beliefs and developing understandings of the learning and teaching processes that lead to the generic aims of environmental education. Participants in the debate, across all sectors of education from experiential nature-based educators (Orr, 1992) to teachers advocating processes of critical thinking and inquiry learning (Fien, 1993, 1998; Huckle, 1993; Huckle and Sterling, 1996) all agree that there is a need for transformational education that results in “new patterns of behaviour”, as first suggested in the 1977 Tbilisi Declaration (UNESCO-UNEP, 1978:8) and discussed in Chapter Two.

I understand that it is the ascendance of short-term planning in modern society that contributes significantly to current sustainability issues, and therefore I prefer to use the language of ‘education-for-sustainability’, referring to educating now, as well as in coming decades, for long-term planning and actions for sustainability. Education-for-sustainability implies learning for change, through appropriate teaching and learning processes that encourage people to examine current behaviours and empower them to engage in more sustainable practices, now and for our future.

Steven Sterling (2001), a leading thinker and contributor to the discourse on education-for-sustainability, develops his extensive argument for reorienting education, using ecological thinking to move towards ‘whole systems thinking’. He explains how whole systems thinking, involving understanding connections, integration and interdependence, assists in organising educational changes to move from transmissive towards transformative learning, in effect requiring a new

educational paradigm “that requires vision, image and design, and action – at all levels” (ibid.:11). The evolution of key terms towards his favoured ‘sustainable education’ is clearly illustrated by Sterling (2004a:50), as over-lapping circles, moving from environmental education (EE), through education for sustainable development (ESD), and education-for-sustainability (EFS) towards sustainable education (SE), a changed educational paradigm.

UNESCO (2005) argues that education is key to shaping the values that lead to more sustainable actions, enabling humans and other species to survive and flourish on our finite planet. Increasing numbers of academics, as cited in this literature review, support this claim. According to the Parliamentary Commissioner for the Environment’s (2004) comprehensive report, *See Change: Learning and Education-for-sustainability*, New Zealand society acknowledges that more education-for-sustainability is needed.

This report considers the many ‘shapers in society’ (PCE, 2004:90), including media, religion, marketing and advertising, highlights the impacts of New Zealanders on our planet and discusses the values and principles that are essential to education-for-sustainability . The roles of different skills and competencies, especially those of critical thinking, reflective learning and participation are recognised as important for developing the values needed for respect for the environment, social equity and the rights of future generations.

Since the start of the twenty-first century there has been an exponential rise in the numbers of academic papers, conference papers, governmental reports, books and general articles in magazines and newspapers that contribute to the general and academic literature concerning education-for-sustainability. This rapid increase in the volume of literature reflects the growing awareness in society that humankind is facing unprecedented environmental, social and economic sustainability challenges at local, national and global levels.

Increasingly, the need for effective leadership, with reference to required transitions to sustainability, is being examined and debated in all sectors of society, including the educational sector, as reviewed in section 2.4 and discussed in Chapter Six.

An increasing number of writers have described case studies of successful education-for-sustainability initiatives, outlining the successes and difficulties of engaging universities in ‘greening the campus’ and integrating environmental education and sustainability concepts into tertiary curricula. Collections of these case studies are found in Bartlett and Chase (2004), Blewitt and Cullingford (2004), Filho (1999, 2000, 2002a, 2002b), Filho and Carpenter (2006), Forrant and Silka (2006), M’Gonigle and Starke (2006) and Rappaport and Creighton (2007).

Academic journals have devoted specific volumes and issues to the debate about and development of education-for-sustainability (EFS), in response to the increasing number of international tertiary learning initiatives being documented and debated. The *Journal of Geography in Higher Education* devoted most of Volume 29 (2005) to a Symposium of papers that focused on *Greening the University Curriculum* and followed that with another Symposium of papers on *Education for Sustainable Development-Continuation*, in Volume 30 (2006). Papers in *Environmental Education Research*, *The Journal of Environmental Education* and the more recently launched (2002) *International Journal of Sustainability in Higher Education* are now complemented by a small number of papers appearing across a range of other academic areas interested in the issues of a sustainable future. Examples of these include economic, business and social development in the *Harvard Business Review*, sustainable architecture, design and building (*Journal of Architecture*, 2003 and the *Journal of Urban Technology*, 1999), philosophy (*Journal of Philosophy of Education*, 2004) and tourism (*Journal of Sustainable Tourism*, 1999) publications.

Walter Filho, the founding editor of the *International Journal of Sustainability in Higher Education* and the journal *Environment and Sustainable Development* is a leading contributor to the discourse and practice for learning and teaching for sustainability in higher education. Filho (2002:16) argues that “sustainability education is especially important at university level, due to the fact that most of

tomorrow's decision makers will have gone through it (university education)", a sentiment that resonates with my thinking and that of many others in the education-for-sustainability field.

Commentators discussing environmental sustainability in local and national papers, on radio and television voice the growing concerns of society and call for 'action' for a sustainable future. Blewitt (2004) argues that universities must heed these calls and become more involved, if their educational contributions are to remain relevant in future decades and I suggest that universities need to examine leadership processes for effectively initiating and then implementing their educational contributions and 'actions' for our more sustainable future.

During the time I was involved in scoping, then carrying out my research, there was a steady increase in the number of contributions in a widening range of scholarly journals, reflecting the growing involvement of scholars in this relatively new and developing field of education-for-sustainability. At the start of my research in 2004 there were only five Aotearoa New Zealand academic contributions that appeared to be highly relevant to my research into education-for-sustainability in universities: Bosselmann (2001), Chapman (2003), Douglas (2002), Peters (2001) and Springett (1995). However, by October 2007 I noted more contributions including Buchan et al. (2007), Chapman and Flaws et al. (2006), Parliamentary Commissioner for the Environment (2004a, 2004b, 2007) Stone and Baldoni (2006) and Williams (2004).

Initially I explored the literature debating education-for-sustainability as a new paradigm for the twenty-first century as well as a context for university education. Then, in response to information from international research participants during my interview-based research, I began investigating the literature surrounding the introduction of successful programmes for education-for-sustainability in universities. At the same time I reviewed the literature related to the challenges and barriers to implementing education-for-sustainability in universities (as prompted by discussions with international and Aotearoa New Zealand research participants).

During and following the use of grounded theory method to analyse my data, I began exploring leadership literature, eventually focusing on the literature most relevant to my research findings that distributed and hierarchical leadership collaboration enables capacity building and effective implementation of education-for-sustainability in universities. This enabled greater understanding of emerging leadership themes, leading to developing a proposed framework for university leadership for sustainability (as presented in Chapter Six).

This review is organised into the following four sections, reflecting the literature research process. These are:

- Education-for-sustainability: a new paradigm
- Processes for providing education-for-sustainability
- Challenges to the successful development of EFS programmes, and
- University leadership for sustainability.

This structure reflects the intellectual journey I made during the construction of this study, following the process of using grounded theory methodology for analysing results, leading to the emergence of theory (as predicted by proponents of grounded theory) (Charmaz, 2006; Glaser, 1992; Strauss and Corbin, 1990).

Additional literature is included in later chapters, with reference to more detailed discussions about leadership (Chapter Six) and university contributions and challenges to education-for-sustainability in Chapters Seven and Eight.

3.2 Education-for-sustainability: a new paradigm

3.2.1 *Global paradigm shifts*

Contributors to the debate on the ‘problems of the world’ (for example: Belshaw, 2001; Bowers, 1995; Derrida, 1991, 1993; and Oelschlaeger, 1995) argue that the recent period of modernity has created a world composed of nation-states, capitalism, faith in science, individuality, mass consumerism, secularisation and an ideology in which liberal humanitarian ideals exist while humans continue to exploit and damage the environmental resources of the Earth. Philosophers critiquing the thinking that led to the scientific rationalism of modernity, including Conley (1997),

Gare (1995) Lyotard (1984) and Milner (1991), argue that postmodernity provides a more pluralistic insight into the fact that society is now more fragmented and less neatly structured than presumed by the modern 'grand narratives'.

According to Milner (1991:104) there have been five decades of increasing 'postmodernist debate', in reaction to the rational, institutional and corporate 'thinking' of modernity, leading to developing understanding for the need to think and act in more socio-cultural ways, understanding the diversity of knowledge that informs social and individual thinking and practice. However, it appears that despite the insights gained, little has changed environmentally in the last few decades.

The grand narratives (or meta-narratives) of past centuries, including for example, religious, capitalist free market and scientific rational frameworks, influenced the human thinking and action that resulted in anthropocentric behaviours that led to our current unsustainable state. The influences of this thinking – that the conquest of nature and unlimited extraction from nature are the answer to human development – continue to prevail in educational institutional structures, global and national government policies and major portions of the business sector. Critique of the thinking attributed to the period of modernity, including philosophical debate on the merits of the principles of Ferdinand de Saussure's structuralism, as developed further by Michel Foucault (Foucalt, 1981) and Louis Althusser, has led to the more recent focus on the principles underlying postmodernity and poststructuralist thinking (Sarup, 1993).

Derrida (1993) is noted as a leading philosopher for his role in rejecting structuralism and creating a number of poststructuralist concepts, reflecting the move from the positivism of modernity, with its polarities and definitions, to the deconstruction, ambiguity and pluralities associated with postmodernism. This changing thinking is reflected in the work of Foucault, who acknowledged his initial work as a structuralist, then rejected that thinking as his views changed, although he never accepted being labelled either a poststructuralist or postmodernist (Crotty, 1998).

According to Gare (1995) the paradoxes that feed the discourse on interpretations of modernity, post-modernity and post-structuralism continue and it appears that environmental problems are regularly explored within discussions reflecting humankind's condition in a postmodern world. Derrida contends that the geo-politics that support the American ideology of growth through increasing consumerism (an effectively modern economic practice) will lead to human catastrophe, an extreme effect of his philosophical 'rupture'.

Derrida alludes to the possibility of a human ecological consciousness – though does not enter into a discussion about the inference – that an improved understanding of human dependence on nature could slow or change our progress towards a predicted catastrophe. While commenting on Derrida's arguments, noting that ecology is not "really brought forward or even considered as a name" Conley (1997:9) argues it is Derrida's readers "upon whom falls the responsibility, first, of developing the latency of its ecological consciousness and, second, of spelling out more clearly where it can be applied". I would suggest that this is exactly what university scholars should be debating, and applying in their teaching and their personal learning for a sustainable future.

A poststructuralist or postmodern appreciation of the complexity of ecosystems, with deeply connected interfaces, across biophysical 'boundaries' (as described in human language) and the understanding that humans are dependent on nature appears paramount. However, there remains a challenge of *how* to communicate, engage and then take social and individual action to alleviate the current environmental crisis and increasing social problems and create a more sustainable future.

For example, Bowers (1995:2) asks "what are the leverage points for affecting fundamental changes that are needed if we are to achieve the goal of an ecologically sustainable culture?" He then enters into very extensive discussions related to the problems of our deeply held cultural assumptions blocking transitions to an ecological paradigm, before simply concluding "that real change ... will continue to be nurtured by reformers ... outside of institutional settings" (ibid.:217). Bowers suggests that it will not be until there is a critical mass in society, thinking in

radically different ways, that mainstream educators will recognise the curriculum biases that block educating for an ecologically sustainable culture. Hopefully, this cultural shift, from modern to post-modern views of our world is in progress.

Unfortunately, within the last decade, as a result of policies and paradigms that prevailed in the last half of the twentieth century, environmental and social crises have increased in number, in step with the rise of globalisation. Gare (1995:99) states “this inability to deal with the phenomenon of a global environmental crisis manifests the loss of contact with the world” and furthermore, calls on society to consider a ‘new world order’ and re-orientate from the current “nihilistic decadence which is now undermining civilization” (ibid.:163) to forge a new world view that includes a global ecological perspective.

Michael Peters (2001:203) argues that “global processes today constitute a second great ecological globalisation in Aotearoa New Zealand”, further observing that it is the negative consequences of current neo-liberal economic attitudes that continue to impact on our ecological advantages and rising social inequities. He suggests that the “first great ecological globalisation occurred with the ecological imperialism that followed first European contact”, bringing with it the Euro-centric civilising mission that “displaced native peoples and species in a demographic takeover” (ibid:204).

Peters concludes that environmental education can provide appropriate contexts to assess environmental consequences, contribute directly to promoting environmental praxis and political action, develop ethical understanding of our human relationship with ecological systems and encourage ‘eco-subjects’ (ibid:215) so that in Conley’s (1997:80) terms “ecology is seen as a concern traversing all political and emancipatory discourses”.

Ecological literacy is needed to develop an intrinsic ecological perspective, a perspective that acknowledges that our ecologies are the non-negotiable ‘bottom line’ when pursuing future sustainable practices, founded within a new world order (Doherty and Geus, 1996; Hawken, 2007). The notion of treading lightly on the earth, while recognising our dependence on ecological systems, needs to be transformed into appropriate actions *for* a new paradigm of sustainability.

This call for a new world view, a change of global paradigm, is supported by the majority of authors engaged in the commentary on education-for-sustainability, including Adams (2006), Blewitt (2004), Filho (2002), Sterling (2001) and Tilbury (2005). The common theme is the need to move from those paradigms that produced the crises we now face, to a new paradigm: a culture of sustainability for the twenty-first century and beyond. Sterling posits that there is evidence of an emerging cultural paradigm, which he describes as a “post-modern ecological paradigm” (2001:45) and discusses why this paradigm needs to be better recognised and understood, if it is to prevail over the current modernist educational paradigm. Sterling argues that the modernist paradigm is mechanistic, managerial and reductionist in approach and continues to value fragmented knowledge, resulting in poor understanding of interconnected ecological and social systems. Furthermore, Sterling (2004a:43) contends that educational culture needs to move away from current concerns with product, to a “holistic educational paradigm concerned with the quality of relationships ... with emerging rather than predetermined outcomes”.

The emergence of new ecological and systemic paradigms are already affecting the discourse on sustainability in wider society and therefore, according to Sterling (*ibid.*:59) “a corresponding response by higher education is both necessary and timely”, if sustainability is indeed to be the new paradigm for decision-making. Increasingly, commentators are suggesting that universities ought to be playing a leading role in sustainability research and teaching, for example Clugston et al. (2002), Filho (2002), Michaelsen (2000), Tilbury (2006) and others. Blewitt (2005) points out that within universities there remains the challenge of moving from discourse to the educational initiatives that lead to learning and activity for changes from unsustainable to sustainable practices. Currently, educational processes continue to reinforce our consumer-oriented and technologically dependent culture, resulting in dramatic impacts on our ecological systems.

This need for change is now even more urgent, as the negative effects of global and national environmental problems intensify. The comprehensive report on the state of global ecosystems, the Millennium Ecosystem Assessment (MEA, 2005) notes that biodiversity losses are accelerating, clear-felling of mature forests continues, fish

stocks decline, and there are alarming decreases in both water quality and equitable access to that water. Although there appears to be increasing societal environmental awareness and public understanding of how *unsustainable* our current patterns of behaviour are, there is relatively little corresponding increase in pro-environmental actions, as noted by Barr (2003) and Kollmuss and Agyeman (2002).

Blewitt (2005:182) asserts that concern for global warming, poverty, endangered species and other pressing planetary issues has “not effectively transformed formal learning opportunities in school, college, university or the workplace.” One of the reasons for the failure to progress changes in educational practices could be a combination of two general issues. One is a lack of engagement at a deep level of understanding, by educators, of the likely consequences of *not* being strongly proactive for changes away from current unsustainable practices, and the other a reluctance to alter their current pedagogical practices, for a number of reasons (as discussed in Chapter Seven).

Scholarly debate on the ‘politics of the environment’ has included claims that environmental interests are simply one of many competing interests (Goodin, 1992). These assertions include the links between democracy and environmental concerns (Gillroy and Bowersox, 2002), citizenship and the environment (Dobson, 2003; Doherty and Geus, 1996) and social movements (Dryzek et al., 2003). While there may be many competing interests and social justice, citizenship and democracy may be integral to the sustainable future of a global society, it is important that education-for-sustainability includes and emphasises future ecological sustainability, while including and connecting to social and economic sustainability.

If maintaining healthy environmental systems is not at the forefront of our thinking, global and local ecosystems will soon be unable to support us, even if we do become an equitable and peaceful global society. Increasing global temperatures are leading to current and predicted climate change impacts (Chapman, Boston & Schwass, 2006; Porritt, 2005; Stern, 2006) and these impacts are significant environmental indicators of past and current non-sustainable human practices (Flannery, 2005). Environmental sustainability remains the ‘bottom line’, because humankind is

ultimately dependent on ecosystem services, as we seek how to solve current social and economic issues in order to create a more sustainable future.

3.2.2 Related ethical reasons

Filho et al. (1996) claim that all institutions, including those of higher education, need to be part of the education initiative needed to support societal changes to achieve the goal of sustainable development. In his preface to the book *Teaching Sustainability at Universities*, Filho (2002b: 9) states that “higher education institutions around the world are beginning to recognise that they have a unique role towards the goal of sustainability.” However, according to Clugston and Calder (1999:3) the modern university is still “deeply involved in providing expertise for an ‘unsustainable’ world economy.”

Clugston and Calder claim that any education continually reinforcing the values and processes that support the unsustainable consumer lifestyle is part of the ‘problem’. This ‘problem’ is recognised by many scholars, including Farrell and Papagiannis (2002:12) who argue that the “difference between needs and wants, quantity and quality, should be part of academic teaching and learning at all levels of education”. This argument is supported by Sterling (2001) who maintains that education, especially our tertiary teaching practices, is actually sustaining un-sustainability.

These claims are strongly supported by evidence of increasing rates of damage to our environment (MEA, 2005) and rising levels of social unrest and inequity (Hawken, 2007). A growing number of researchers are addressing the question of why tertiary institutions should be more concerned about and actively involved in re-orientating student learning towards learning for sustainability. In *Environmental Education for the 21st Century*, Thompson (1997:9) maintains that “environmental education must be placed at the heart of policy and curriculum processes” at all levels of education and Filho (2002b:9) further argues that “the success of higher education in the twenty-first century may be judged also by its ability to make sustainability a cornerstone of academic practice”.

However, university vision and mission statements more often declare that their institutions are constituted for achieving academic excellence, the advancement of

knowledge, research activities of an international standard and similar general statements, rather than developing a future-focused vision and mission that places a sustainable future as an integrative framework for their thinking and activities. Despite this, hundreds of universities worldwide have signed up to declarations of commitment to sustainability, as evidenced by the numbers listed on websites for the following; Talloires Declaration (1990) (Appendix 1), the COPERNICUS University Charter for Sustainable Development (1993) (Appendix 3) and the principles of the Earth Charter (2000), listed in Appendix 2.

Clugston and Calder (1999:3) note that although signing the Talloires Declaration constitutes a symbolic act for some universities, for others it “continues to be an impetus and framework for steady progress towards sustainability”. This suggestion is echoed in the comment made by Clugston (2002) who claims that despite some critics deeming sustainability declarations to be simply ‘green-washing’ and others arguing that most declared progress is simply sustainability rhetoric, overall some progress is being made.

There is an increasing number of academic collections of international case studies, (including Blewitt and Cullingford, 2004; Filho, 1999, 2000, 2002a, 2002b; Filho and Carpenter, 2006; Forrant and Silka, 2006; M’Gonigle and Stark, 2006 and Rappaport and Creighton, 2007) and growing numbers of authors commenting on the varied ways universities can contribute to learning for a more sustainable future. This rapidly rising volume of literature lends support to Clugston’s view that there *is* more progress towards sustainability initiatives in international universities.

According to Filho (2002:9) universities are “uniquely positioned to influence the direction we choose to take as a society”, and New Zealand’s Parliamentary Commissioner for the Environment (PCE, 2004:79) comments that “if (New Zealand) tertiary graduates do not have a core understanding of sustainability then the pathway to a sustainable future will remain a side road for far longer than necessary”. It is likely that becoming involved in learning for sustainability programmes will assist educational institutions to move more quickly towards the goal of sustainable education, as described and advocated by Sterling (2001) as a way of providing possibilities for moving from present non-sustainability to a more sustainable future.

Many universities now do have improved environmental management systems, some due to government policies, legislation and regulation (Scott and Gough, 2006) or special projects, for example the Higher Education Partnership for Sustainability (HEPS) in the United Kingdom. The HEPS project focuses on implementation of good environmental performance throughout participating universities (Bennet et al., 2004). However, many more universities fall well short of 'practising what they preach' or 'walking the talk' of sustainability practices, despite increasing internal student pressure and the presence of fledging sustainability courses. Such issues can be potentially damaging to the credibility of a university, especially in a society that considers sustainability issues to be paramount.

An expanding body of work addresses the varied progress and success of tertiary institutions in embedding operational environmental management systems into their management structures. Alabaster and Blair (1996) describe many successful initiatives and chart the progress, during the early 1990s, in 'greening' Higher Education (HE). More recently, Bartlett and Chase (2004) in *Sustainability on Campus* share a number of narratives for those interested in 'greening the campus', along with stories reflecting on the changes needed in universities to enable education-for-sustainability to be integrated into the curriculum. Most initiatives to 'green the university' are begun by students and staff prepared to advocate for action. These occur in spite of lack of university-wide support (Walker and Lawrence, 2004), and gradually build momentum, moving from small action research efforts linked to operational practices to university wide considerations of basic sustainability literacy in specific or all curricula.

There is evidence, particularly in geography departments, that issues relating to sustainable development are not only a major focus of teaching but are also key drivers of research development and consultancy activity (Scott and Gough, 2006). However, Scott (2006) also points out there is no sense that universities are using sustainable development strategically to link business, learning, research and community functions as envisaged by, for example, UNESCO. Forum for the Future (2003) notes that universities in the HEPS programme were initially despondent about possibilities for strategic change, because all governing externalities were still in the mode of 'business as usual'.

One of the problems facing university-wide learning for sustainability, as identified by Reid et al. (2002) is that “work related to sustainable development continues to be seen in many cases as a costly add-on to existing programmes, rather than as a means and opportunity better to achieve existing goals.” Clugston et al. (2002) discuss the reality of the situation, a decade since the Rio Earth Summit (UNCED, 1992), as being one of higher education becoming increasingly focused on promoting economic growth (without concern for the ecological and social foundations of the economy).

Another problem is the apparent low levels of societal understanding of humankind’s ultimate dependence on global ecological systems (Cortese, 2003a, 2003b; Gare, 1995; Orr, 1992 and Sterling, 2001). Furthermore, it appears that students can graduate from most higher education institutions with an undergraduate degree and be both environmentally illiterate and unaware of resource distribution inequities, as noted by McIntosh et al.(2001) and Wolfe (2001). Reasons for poor environmental literacy are suggested by a number of authors, including Orr (1992) and Sterling (2002). One of the reasons could be the very low numbers of students enrolling in courses with an ecological literacy component, as reported by Wolfe (2001). Following his national survey of non-environmental majors at four-year institutions in the USA, Wolfe found that only 11.6 percent of the 1,172 respondent institutions required environmental literacy of their graduates.

Another survey, of both two- and four-year colleges in the USA showed that only 8% of higher education institutions have an environmental literacy undergraduate requirement for all students, with another five percent that have this requirement for most of these students (McIntosh et al., 2001). Unless students in the USA major in environmental studies or biology they probably complete their studies without gaining any environmental literacy.

This situation is apparent in most countries, as mentioned in the literature exploring education-for-sustainability in universities (Filho, 2000, 2002; Sterling, 2002; Tilbury, 2004, 2005). Ashley (2005) notes that there is planned continuity of transferable skills such as communication, numeracy and IT from pre-tertiary

schooling into United Kingdom higher education. However, according to Ashley “there is no key skill such as *understanding sustainability*” (ibid.:188), a situation that reflects the lack of provision of ecological literacy learning opportunities in the wider range of university courses.

If this ecological and sustainability learning deficit is to be improved it would require changes in some of the pedagogies used by university teachers. Bowers (1995) argues that this may be problematic, because simply understanding ecological principles is not enough. Bowers pays particular attention to the issue of appropriate teacher education for educational changes, and contends that university teacher education programmes fail to address issues of different forms of learning, and related curricular and pedagogical approaches, in relation to current values that continue to devastate our environment. This contention is supported by numerous scholars, including Blewitt (2004, 2006), Filho (2000, 2002a, 2002b), Law (2003), Palmer (1998), Sterling (2001) and Tilbury (2004, 2005) who all lament the lack of teacher professional development opportunities for teaching and learning for sustainability.

There is no doubt that universities can choose to ignore the need for re-orienting curricula to include education-for-sustainability and continue teaching in a ‘business as usual’ manner. However, as Rowe (2002) argues, if universities fail to implement operational and pedagogical changes for sustainability, then they ignore their responsibilities to equip students with the understanding, capabilities and empowerment to take part as positive ‘change agents’ for a more sustainable future. Blewitt (2004:6) contends that “[u]niversities should act as exemplars” but they are not (yet) models of good sustainable practice, nor do they show initiatives for sustainability education, which Sterling (2001) identifies as a preferred goal of education.

3.3 Processes for providing education-for-sustainability

In the following section, I examine the current structures and priorities of Higher Education in a number of countries, particularly Australia, the United Kingdom and the United States of America, in relation to education-for-sustainability. Many

researchers – including Cotton et al. (2007), Cullingford (2004), Dawe et al. (2005), Scott and Gough (2004, 2006), Smith et al. (2004) and Thomas (2004) – argue that current university priorities severely limit opportunities for academics and student learners to become fully engaged in the societal debate about emerging, complex issues, resulting in little effort to integrate these issues into curricula.

3.3.1 Sustainability literacy for all students

Although Rowe (2004), Bekessy et al. (2003) and other contributors note that few universities include sustainability understanding in their graduate attributes, there are some higher education institutions that do have sustainability learning expectations, as part of their core General Education. For example, there are requirements for undergraduates to have an in-depth focus on sustainability, including an environmental literacy component as well as a civic engagement and/or social responsibility component at Murdoch University in Australia.

Rowe (2002) examines progress in a number of community colleges and universities in the USA and comments on the success of some case studies with both the infusion of sustainability and creation of specific sustainability learning programmes. It is worth noting that there are accounts of individual and student group changes to sustainable practices in the short term, but little, if any, evidence for long term changes in practice. This is not surprising given the relatively short time that most sustainability learning initiatives have been in place and the difficulties of long-term research on individual behaviours.

According to Wright (2004) there are increasing numbers of higher education institutions in the USA, Canada, Europe and Australia that have signed declarations of commitment to sustainability and are considering the requirement of environmental literacy, for all students. However, Stone and Baldoni (2006) make no similar claims for universities in Aotearoa New Zealand. Chalkley (2006) suggests, in his introduction to the *Journal of Geography Higher Education* Symposium, that “a key challenge for higher education is ... to find the most effective ways of producing large numbers of ‘sustainability literate’ graduates”.

The meaning and implications of being ‘sustainability literate’ are discussed further in Chapter Seven, building from the following reasonably succinct explanation of what a ‘sustainability literate person’ should be able to do. Forum for the Future (2003:30) suggests that: “A sustainability literate person is able to:

- understand the need to change to a more sustainable way of doing things
- have sufficient knowledge and skills to decide and act in a way that favours sustainable development
- be able to recognise and reward other people’s decisions and actions that favour sustainable development.”

Increasing numbers of international universities are developing a list of graduate attributes that all students should acquire before graduating: for example, there is a list of information literacy attributes suggested for Australia and New Zealand (Bundy 2004). The aim of generic attributes is to encourage the development of life-long learning skills, including communication, problem-solving and collaborative ways of working that enable learners to use their acquired knowledge and understandings in new and innovative ways. Many universities do have statements referring to information literacy and social responsibility, but without a reasonable level of sustainability literacy and an institutional framework or vision for a more sustainable future, it is likely that graduating students will continue to adopt the unsustainable practices of their society.

Rowe (2004) describes how graduate attributes with a focus on sustainability were integrated into existing faculty courses, ensuring that all students had opportunities to attain these attributes. According to Rowe, this helped generate “a momentum towards sustainability in all the sectors of the institution” (ibid.:155). Holdsworth et al. (2006) describe a curriculum change project at RMIT University that provided a comprehensive list of the desired student capabilities, skills and attributes needed for learning the principles of sustainable development. This was intended to help academic teachers choose appropriate transformative learning experiences. Similar initiatives are noted in a range of case-studies, probably reflecting the situation many academics find themselves in, that they have not had training in pedagogies most relevant for learning for sustainability.

The problem of low levels of pre-service training in learning for sustainability pedagogies is discussed by many researchers, including Bolstad et al. (2004), Fien and Tilbury (2002), Law, (2003), and McKeown and Hopkins (2002). There is limited literature referring to how universities *are* providing learning in teaching pedagogies that are appropriate for education-for-sustainability teaching. The value of training pre-service teachers is recognised in Greece, where the university education departments provide some environmental education in the initial curricula programmes for teachers, even though, according to Tsaliki (1998:189) the “time specified for this work is woefully brief”.

Another example is the Bachelor of Science for Social Services teaching course in both the University of Hong Kong and the Chinese University of Hong Kong which, according to Ho (1998), have a compulsory ‘Environmental Education’ module, although other teaching programmes have only elective Environmental Education courses. In Aotearoa New Zealand two universities (Canterbury and Waikato) offer elective papers and Waikato University also has one compulsory teacher pre-service half-year paper in environmental education.

3.3.2 *Designated and targeted sustainability programmes*

In Australia, an increasing number of universities have established post graduate programmes specifically tailored for graduating with a Master of Sustainable Development or Master for Sustainable Futures, as outlined by Thomas (2004), and in America and across the European Union increasing numbers of undergraduate and Masters level degrees with a context and focus of sustainability are being established. It is beyond the scope of this thesis review to list all these programmes, but they can be found in the collections of case-studies of sustainability curriculum initiatives, including those edited by Blewitt and Cullingford (2004), Bartlett and Chase (2004), Filho (2002a, 2002b,) Filho and Carpenter (2006), and other publications, as well as on the websites of specific universities with sustainability education initiatives.

A decade ago, Robottom (1998:3) stated that “formal award-bearing courses that examine educational issues concerning policy, organisation and practice in environmental education are relatively rare...” and reported that perhaps only three

Australian universities had course work Masters degrees in environmental education. More recently, the *Universities and Sustainability* report (Bekessy et al., 2003) summarises a survey of all Australian universities to determine their progress in implementing sustainability policy and practice, including curricula programmes and concluded that there is movement at most universities, but that there is still a long way to go. One of their many recommendations is for integration of sustainability learning across the curriculum. However, Tilbury (2003:98) argues that innovation, rather than integration, is needed to enable curriculum change for sustainability because “it cannot be inserted into existing and learning structures”, for the reason that the existing curriculum implicitly promotes unsustainability.

Sherren (2006a) investigates the use of sustainability concepts in Australian universities’ curricula and concludes that sustainability integration is generally inadequate, but where it is happening it is meaningful. However, Sherren finds that sustainability education appears to be more concerned with understanding environmental principles, rather than social interactions with the environment, leading her to posit that more liberal study education could improve critical thinking to help address the social action issue.

Leading the way in Canada is an innovative EFS model involving collaborative action-research and curriculum development between two universities and two tertiary institutions. The Learning City Project at the Great Northern Way campus site in Vancouver is a 2005 initiative now providing a new trans-disciplinary curriculum where knowledge is jointly constructed by instructors and students (J. Moore, personal communication, April 19, 2005). University students and members of their community are engaged in real-life experiences while learning about and contributing to a sustainability project for better transportation options in the city and beyond.

Chapman and Flaws et al. (2006) and Stone and Baldoni (2006) note that universities in Aotearoa New Zealand have a very low number of courses offering substantive learning about sustainability issues, as discussed in Chapter Two, section 2.4.3. Chapman and Flaws et al. argue that understanding the constraints and barriers within present educational frameworks needs to come before any education can

result in sustainability education outcomes, an argument that appears fairly self-evident, as no successful changes are possible in education without understanding cultural and structural constraints. This argument is supported by many scholars, including Kezar and Eckel (2002), Huckle and Sterling (1996), McKeown and Hopkins (2002) and Stone and Baldoni (2006).

It is important to note that there are many ways to cope with and even reduce such constraints and barriers, as described in Chapter Seven.

Blewitt (2004) suggests that the global demand for new ‘disciplines’ such as media studies or environmental science reflects the ‘real world’ need for new learning that is trans-disciplinary. He argues that because sustainability and sustainable development learning is about existing connected systems, they “certainly require a transdisciplinary or interdisciplinary approach to teaching, learning and research” (ibid.:2). Furthermore, Blewitt maintains that even though disciplines are important for “comprehending (or not comprehending) the contemporary world”, it is the way disciplines include contextual interpretations of sustainability that will allow for the development of new understandings of human dependence on ecological systems.

The New Zealand Parliamentary Commissioner for the Environment (PCE) reasons that sustainability education would “require changes in education practices, addressing the way knowledge is sliced up into disciplines, as well as making structural changes in institutions” (PCE, 2004:76). Understanding that changes in pedagogy are needed is acknowledged by many contributors, including Robottom (1987), Sterling (2001, 2004) and Tilbury (1998, 2004), and this understanding is supported by academics across a range of disciplines also advocating changes in the way tertiary learning is structured and ‘taught’. An example is Smith et al. (2004) who, while acknowledging the introduction of new sociology texts (for example they cite Marcionis and Plummer’s (2002) text), contend that while having relevant chapters on social and environmental issues, such texts fail to focus on or debate sustainability, despite its sociological significance. They argue that their analysis of seven listed key texts shows opportunities to engage deeply with sustainability issues have been missed and thus learners will conclude that sustainability is not main-stream (Smith et al., 2004:195).

3.3.3 Establishing support for sustainability education.

Universities are continually adjusting programmes, as they have always done, driven by the needs of a changing society though Duderstadt (2000:9) comments that universities “are not yet transforming themselves into educational institutions suitable for our future”. However, Clugston et al. (2002) note that despite the lack of funding support, and low demand from students and employees for sustainability in universities there are many sustainability initiatives taking place in higher education. Most of these initiatives are departmental or faculty based, and there are few examples outside smaller colleges in the U.S.A. that demonstrate authentic interdisciplinary sustainability learning. According to Filho (2002b) the major challenge in education is to identify, understand and promote higher education initiatives towards sustainability.

Dourala et al. (2002:391) make the claim that “the existence of a policy or vision with respect to environmental sustainability often lays testimony to the coherence and maturity of the university’s approach in becoming a model of sustainability”. This implied need for high-level support for sustainability initiatives is echoed within the case-studies describing transitions to sustainability in the academy. Often the value of hierarchical leadership support is mentioned in an ‘ad hoc’ way or as an ‘aside’. For example, Jerman et al. (2004) comment on the value of having effective ‘champions’ within the university hierarchy, in order to progress sustainability initiatives but do not discuss how valuable that is for extending sustainability learning opportunities.

For those universities seriously contemplating a shift towards education-for-sustainability, Moore (2005) provides a set of recommendations to aid in the creation of sustainable education programmes. These recommendations include, among others, “infusing sustainability into all university decisions ... and focusing on personal and social sustainability”. Moore’s participatory research led to her belief that both space for reflection and pedagogical transformation are needed, in order for members of the university community to be successful in integrating sustainability education into their teaching and research. Smith, et al. (2004:203) comment, from a sociological perspective, that if opportunities and supports are in place “the only problem which then remains is the one regarding academics themselves and whether they come to accept sustainable development as a serious sociological issue”.

There are many internal and external influences that impact on a university and the role of external drivers for encouraging universities to engage with education-for-sustainability is discussed by a number of writers. Haigh (2005:31) considers that the current (2005-2014) United Nations Decade of Education-for-Sustainable Development “offers academe’s best chance to date for making the deep and radical changes that will be necessary if the world’s higher education institutions are to enact their responsibilities for creating a better and self-sustainable world”. Another international driver, one that is promoted by ULSF (University Leaders for a Sustainable Future) is the Earth Charter declaration Principle 14 that urges integration of the knowledge, values and skills needed for a sustainable way of life into formal education (Earth Charter, 2000, Appendix 2).

In recent years there have been significant changes in the United Kingdom, through the establishment of well-funded Centres for Excellence in Teaching & Learning (CETL) in a number of universities. An example is the “Sustainable Futures” centre at University of Plymouth which has a particular focus in education-for-sustainability (Dyer et al., 2006). This initiative is strengthened by the involvement of Forum for the Future and the Schumacher College, both recognised internationally as United Kingdom leaders in encouraging and progressing sustainability education.

There are growing numbers of collections of case-studies of sustainability initiatives, including *Sustainability on Campus: Stories and Strategies for Change*, edited by Bartlett and Chase (2004). This collection brings together contributors from a range of universities and colleges in the United States, to describe their processes, progress and visions for sustainability education in their educational institutions. Many writers describe how institutions moved, over time, from operational practices to the inclusion of sustainability concepts and issues into curricula. One of the most successful infusions of sustainability into the curriculum is the exemplary Ponderosa Project at Northern Arizona University (Chase and Rowland, 2004) that now serves as a model for the development of other university development projects.

In Aotearoa New Zealand, despite generic constraints, individual initiatives are being implemented. A relatively recent initiative (Buchan et al., 2007) is the new Lincoln

University Masters-level subject, titled ‘Aspects of sustainability: an international perspective’. The development of a Lincoln Masters sustainability-focused programme appears feasible because it has been established within the post-graduate structure, where multi-disciplinarity is now more widely accepted. Dale and Newman (2005) contend that problem-based applied learning needs to take place within an inter-disciplinary approach and most contributors stress the importance of using an interdisciplinary approach for reconciling sustainability and development when designing and teaching sustainable development related programmes.

3.4 Challenges to the successful integration of programmes

3.4.1 Acknowledging that sustainability requires change

There is increasing global opinion that sustainability is becoming a matter of grave concern, as evidenced by global warming leading to climate change, the most significant environmental indicator of past and current non-sustainable practices (Chapman, Boston & Schwass, 2006; Porritt, 2005). Growing levels of debate in global, regional and state institutions increasingly focus on the predictions of social and environmental crises, and calls for more sustainable practices.

In his introduction to *The Sustainability Curriculum* Blewitt (2004:1) expresses his concern when he suggests that while goals of sustainability are slowly permeating the values, policies and practices of government, business and education “many would consider this to be occurring in geological rather than human time.” Lozano (2006) focuses on the lack of adequate institutionalisation of sustainable development into universities, and notes that many universities remain unaware of sustainable development or “confuse it with environmental sustainability” (ibid.:787). Lozano agrees with Tilbury (2005) when he suggests that innovation could be key to incorporating sustainability in universities, and there are many innovative ways that individuals can incorporate learning for sustainability into their teaching and research activities.

In the previous section, reference was made to successful case-studies of sustainability learning initiatives, some of which refer to both generic and unique challenges encountered when implementing their programmes. However, Velazquez et al. (2005)

mainly focus on the factors that impede the implementation of such programmes, as discussed in Chapter Seven. They give as their reason for this focus their desire to reveal failures, in order for sustainability education agents of change to contemplate how best they may overcome the many institutional barriers frequently confronted.

One of their main findings from an extensive literature review, from 1990-2002, is that “adequate conditions for the successful implementation of sustainability programmes *do not exist*” (ibid.:389, emphasis added). Despite this, they point out that sustainability initiatives on campus are increasing, presumably as individual agents of change respond to societal concerns. The implementation of changes to a more sustainable paradigm seems even more problematic when Orr (2002) reminds us that formal education has to compete with the external non-sustainable social culture.

Cortese (2003a) maintains that there are considerable challenges for a society that wishes to graduate students who can overcome the wider ‘pervasive form of learning’ and become aligned with valuing and acting for a more sustainable future. The informal educational effects of current rapid social ‘development’, including increasing urban sprawl, multinational corporations and non-stop advertising that encourage excessive consumerism in expanding shopping malls and supermarkets are both subtle and obvious in their pervasive influence. Cortese discusses some of the challenges and contends that the “content of [sustainability] learning will require interdisciplinary systems thinking, dynamics and analysis for all majors, disciplines and professional degrees” (ibid.:18).

3.4.2 Pedagogical challenges

Accepting that a changing world is a constant feature of life today, compared to the incremental change in previous centuries, it follows that educational methods for learning in such a rapidly changing world do need to be altered. According to Sterling (2004b:59) ‘new ways of learning’ need to be transformational and they need to be planned, supported and integrated into all existing educational institutions, if we are to meet our obligations to our children and future societies. A corresponding response by higher education is both necessary and timely. Bloland (2005:122) suggests it is at best difficult to use conventional means of educating

higher education students when we are experiencing “...extraordinary and rapid changes taking place in our society”.

In educational literature there is increasing debate exploring both the nature of education, and those modern teaching methodologies that result in an imposed ‘education in change’ (that is, for example, transfer of information), compared to using methodologies enabling ‘education for change’ (Sterling 2001). Sterling argues that “sustainable education is essentially transformative, constructive and participatory” (ibid.:35) and points out that to achieve ‘education for change’ there needs to be corresponding and sympathetic changes in those education practices that are currently instructive and transmissive in their methodology.

Universities are regarded as good at transmitting theory, and have a huge range of transmissive, knowledge rich programmes for students. However, as McKeown (2002) points out, universities do not always value practice, and a lack of supporting financial and other resources create barriers to reorientation towards sustainability education. This problem reflects the fact that very few universities have invested in professional development opportunities that aim to encourage staff to examine the relevance of sustainability to their research and teaching initiatives.

Tilbury (2004:104) makes us aware that, “The key issue is often that few higher education staff are familiar with Environmental Education for Sustainability as a process of learning”; instead, they regard ‘sustainability’ as content to be taught. Continuing to teach graduates as if current methods were adequate is of concern to those involved in teaching and learning for sustainability and this unease is reflected in Dingle’s (1998:3) contention that “If we continue to produce lawyers, business people, teachers ... and other graduates while failing to create in them a high degree of environmental literacy, a university is not fulfilling the obligations it has to society.”

Environmental literacy is a fundamental component of understanding the complexity of sustainability issues and there are multiple opportunities to re-orient university education to include education-for-sustainability. However, as Thomas (2004) observes, there is

relatively poor implementation of education-for-sustainability in Australian universities, even though several are signatories to the Talloires Declaration.

Many of the speakers at the Macquarie University Summit in Environmental Education-for-sustainability noted the need to develop university graduates with creative and futures thinking skills and highlighted “the importance of teaching students how to think and reflect critically, regardless of their specialisation” (Tilbury, 2004:104).

Curriculum changes are predicted by Newby (2005a), and argued for by an increasing number of commentators addressing the lack of learning for sustainability within universities. Tilbury (2004) suggests that curriculum changes, in conjunction with improved operational sustainability practices may be slow to materialise, until there is more pressure from external influencers, for example professional bodies and government policy agencies.

A critical limiting factor, and one that directly affects the ability of students to become environmentally or eco-literate, is the current predicament that most teachers are not themselves eco-literate. If this basic understanding eludes teachers then there need to be life-long learning opportunities to encourage adult ecological literacy (Orr, 1992), so that teachers can guide students to this fundamental knowledge of how their world works. The question that needs to be asked is whether university teachers are actually working to help students be “both capable and willing to accelerate change to a sustainability society” (Johnston and Buckland, 2002:16). Furthermore teachers themselves will need to become continual learners and active collaborators in this rapidly expanding knowledge arena of complex and connected sustainability issues and impacts.

McKeown (2002) lists a number of barriers to re-orienting teacher education towards sustainability, namely:

- lack of awareness that re-orienting to achieve sustainability is essential,
- lack of clarity of what re-orienting entails,
- the limits of the traditional disciplinary boundaries that reward teachers for work within the confines of the discipline only,

- inadequate financial and general resource support for change and lack of support for innovative change.

Despite these barriers, increasingly there are opportunities for academic learning, for example in a curriculum change project at RMIT University (in Australia), as described by Holdsworth et al. (2006).

Dall’Alba (2005:367) describes her experiences in a collaborative pedagogical relationship with experienced university teachers, leading to participation in further learning so that a critical mass of people become “committed to promoting student learning within the institution”. Communities of practice (Wenger, 1998), or spaces of influence, for learning for an unknown future (Green, 2005) and the development of the praxis of ‘trust’ (Gibbs, 2004) are some examples of the various ways university teachers can engage with others to enhance their reflexivity, critical thinking, co-creation of new understandings and knowledge of pedagogies that better serve students of the twenty-first century.

When discussing the many and varied opportunities for learning that a sustainability curriculum can provide, Savan and Bell (2001:307) point out that “as a first step, we should recognise that we cannot continue to educate students with the curricula and methods of the past”. They quote a finding from the Sustainable Toronto project: that “Sustainability favours decision making processes that are participatory, transparent, equitable and accountable” as an example of why new pedagogies for learning are needed, if people are to engage in sustainability learning. It is noteworthy that one of the key outcomes for the Unity College’s required courses in sustainability is for students to develop advanced critical thinking (Womersley and Marshall, 2002:379) through learning based on sound disciplinary knowledge within a context of citizenship for sustainability.

3.4.3 Structural and cultural challenges

In 1992, Cameron and Tschirhart (as cited in Becher and Trowler, 2001) described the new United Kingdom Higher Education system as operating in a post-industrial environment characterized by turbulent change, information overload, competitiveness, uncertainty and, sometimes, organisational decline. Little appears to

have changed a decade and a half on, including the way university education 'systems' remain hostage to managerialism and a modernist paradigm of transmissive education. Barrow (1990:258) makes reference to the twentieth century cycles of autonomy and totalitarian control of universities, and comments on the outcomes, as "each cycle has resulted in deeper penetration and stronger regulation of the university by corporate and the capitalist state". This, according to Barrow, led to institutions with high levels of competition, scarce resources and new associated costs, as well as unpredictable fluctuations in enrolments.

The fact that the present culture and organisation of most universities establishes a number of barriers to incorporating sustainability is examined by many commentators, including Blewitt (2004), Filho (2002a, 2002b) and Sterling (2001). They use similar language to maintain that the university has been influenced by corporate hegemony and is now imperfectly organised, with corporate management techniques that do not necessarily best serve the notion of sustainability. According to Barrow (1990:253) the closer ties between university, state and corporate capital lead to "an ideology of higher education which explicitly defines the university as merely another business organisation".

Earlier, through the 1980s and 1990s, academic discussions about the university as an organisation rather than an educational institution led to suggestions that the culture of the university was under threat from becoming increasingly managerial and commercialised. Following a number of research contributions to this debate, Barnett (2000a:48) describes universities, whether large or small as "a conglomerate of knowledge factions, interests and activities" and suggests we should be suspicious of the notion that an integrating characteristic could be shared across all sectors of the university. This idea is investigated by Silver (2003) in a paper titled *Does a University Have a Culture?* in which Silver questions the use of using the framework term of 'culture' where it is used to describe "a shared way of thinking and a collective way of behaving" (Becher, 1984:166). Silver furthers the argument that an academic's sense of culture is aligned more closely to their discipline, than the entity of the university, and supported by Becher's notion of academic tribes he then questions "whether it is feasible to discuss the university as a unitary entity" (ibid.:158).

If, as intimated by Barnett (2000), Becher (1994) and Silver (2003), the post-modern university has lost the capacity for showing some coherence of learning and teaching intent, then the sustainability context provides an opportunity to restore some shared norms by enabling student learning for sustainability, without harking back to a modernistic ‘grand narrative’ paradigm. The strength of a community of interest in education and research for sustainability could connect diverse, fragmented groups of disciplinary scholars, even if the result was initially a ‘collection’ (Astin and Astin, 2000) of interdisciplinary scholars, rather than a university-wide community of scholars. If this ‘collection’ of diverse interests became connected, through building shared understanding within a sustainability context, then the university may begin to reflect a sustainable institution with variety, diversity and a focus on the needs of student learners who face new challenges.

Unfortunately, the evidence is that engaging universities in sustainability initiatives continues to be problematic, both internationally and in Aotearoa New Zealand. For example Savan and Bell (2002) comment that in Canada, the application of sustainability principles to university curricula remains an ongoing challenge, despite the growing acceptance of the principles of sustainability in the wider society surrounding the academic community. Many authors (Filho, 2002a, 2002b; Pittman, 2004; Sterling, 2002; Tilbury, 2004) refer to the problems universities face when integrating sustainability learning across academic disciplines, using an interdisciplinary, multi-disciplinary or trans-disciplinary approach.

Velazquez et al. (2005:384) analysed the literature from 1990 to 2002, including important references prior to 1990, in order to identify “the factors that could obstruct the implementation of the sustainability initiatives in higher education institutions.” Their reason for undertaking such an extensive review was to assist “key players to improve the effectiveness of their potential or current sustainability initiatives,” in preparation for increased sustainability education being advocated during the United Nations Decade of Education for Sustainable Development.

Their list of 18 barriers is presented (see Chapter Five, Table 4, p.141) from the highest to the lowest degree of incidence as presented in the information sources they

used. They note that “the order in the list does not represent any implied ranking of importance” (ibid.:384) and argue that this is because university sustainability initiatives are developed and established in different ways, depending on the variables and context of the *specific* university.

There are many different strategies that can be used, dependent on the specific ‘situation’ of a university and I suggest that there are key, underlying themes of leadership that are more likely to be common to most universities, as discussed in Chapter Six.

Dixon and Sharp (2007: 8) sensibly argue that “[I]nterdisciplinary collaboration should not be seen as an activity that replaces or devalues the usefulness of discrete disciplines” but as an important means of creating new knowledge. Nevertheless, the importance of interdisciplinary learning opportunities for strong sustainability understanding cannot be underestimated and will require shifts in the way scholars teach both within their disciplines and in collaboration with scholars in other disciplines.

Klaus Bosselman (2001) explores whether the university and sustainability have compatible agendas and states succinctly that “The complexity of sustainability can only be communicated across boundaries” (ibid.:171). He argues that although there is a strong case for the implementation of sustainability in the curricula of the university this will involve problems because “the grand narratives of modernity are at stake” and doubts the ability of the university to overcome its traditions (ibid.:184). The longer the university culture remains anchored in the modern paradigm (favouring the transmission of knowledge), despite the growing understanding of the different pedagogical approaches needed for both individual and societal education, the more difficult it will be to make the transitions to a paradigm of sustainability.

Jeffrey Alexander (1993:3) argues that “the disciplinary basis of undergraduate education is not rational. It emerged for historical reasons that had nothing to do with pedagogy, and functions today to support the creation, evaluation and maintenance

of new knowledge by scholars”. Alexander points out that another function of the university is to help young people become ‘more sophisticated thinkers’ and of course responsible citizens. Sophisticated thinkers are those who can think beyond the borders of their discipline, engaging with a wide range of knowledge while remaining cognisant that we are living in a connected world and we are dependent on life supporting natural ecologies.

According to Becher (1994) there are “daunting barriers in the way of achieving a greater degree of intellectual coherence in the academic world”, including attitudes of academics from ‘insular disciplines’ that reveal substantive ignorance problems, as reflected in their misconceptions and stereotyping of other colleagues (Harman, 1990). I discuss these ‘daunting barriers’ in Chapter Seven and suggest that there are ways that these barriers can be overcome. In reality, relatively few universities have considered how to move beyond internal and external constraints to integrate learning and teaching for sustainability into some university curricula and “very few have addressed the challenge of creating a twenty-first century university ethos for a sustainable future” (S. van der Leeuw, personal communication, September 20, 2006).

Drummond (2003:59) explores the influence of the ‘knowledge economy’ in higher education and suggests that “Educational institutions may say that they are student-centred, when actually they are becoming more knowledge centred” and argues that “in their quest for transparency of competencies and outcomes” they should be moving from knowledge-centred learning to offering students learner-centred choices for wider (and deeper) understanding across a range of discipline areas.

Barnett (1994) questions whether a sense of community can be realised in academe, and offers a range of proposals aimed at recovering the academic community, which he considers has eroded and is no longer meaningful. His contention (ibid.:7) that “a loss of community among academics has to result in a loss of community in the wider society” fails to acknowledge that the oft-cited problem of academic lack of communication across disciplinary boundaries is not reflected in society. In fact, the wider sustainability discourse of society reflects changing societal expectations for

integrated understandings and solutions for sustainability issues. The university needs to respond and reflect that, in order to be relevant with contributions addressing global and national sustainability issues (Blewitt, 2004).

Researchers and commentators consistently refer to the problems that are created by the higher education structure of separate, individual, competing disciplines. Disciplinary distinctions lead to quite separate views of the world and what is regarded as ‘truth’ depends on the value assigned to that body of knowledge deemed to be most important for a specific discipline. These disciplines contend for students on seats (or on their e-learning computer) and rejoice when numbers increase – the department gets more money, more students are available to assist with research projects, which result in more papers published, raising the prestige of the university. However, the university can and should be one of the sites where urgent questions about learning together, for a future culture, can be raised. Sterling (2004) argues that if universities wish to remain relevant creators and facilitators of knowledge then they need to join that discourse. Education law in many countries, including New Zealand⁶, legislates that universities “accept a role as critic and conscience of society”. According to Bowden (1990:259) there are hopeful indications that American academics are willing to move from the ‘medieval conception’ of a vocation of professional autonomy to concepts of academic democracy.

Scholars increasingly debate the role and relevance of a ‘modern’ university in an uncertain twenty-first century. Paul Gibbs (2004:8) argues that “universities can provide responsible learning communities which respect individual freedoms and engage in the furtherment of what we might become” and Newby (2005) discusses the idea of self-managing networks of learners, and the emerging understanding that ways of knowing will be more important than the content that is learned. Newby further observes that as the world changes, the curriculum must change and teachers must take the roles of interpreters and guides for student learning.

In *The Greening of Academe*, Rosanne Wille (1997) acknowledges the difficulties in changing the culture and reward systems in American colleges, while providing an

⁶ Education Act of New Zealand (1989), Section 162 (4) (a) (v).

overview of some of the initiatives taken to enable what is sometimes called ‘greening the curriculum’ in Lehman College, The City University of New York. Wille argues that for college-wide cooperation for designing a systems based curriculum, the “key to success is to foster mutually beneficial collaborative relationships among academic disciplines” (ibid.:331).

Theoretically the opportunities to ‘organise’ institutional change, despite the complexity of the challenges facing such change lie both in understanding the institutional systems, in regard to operational practices, and what is required to shift the minds of academics. Most universities have some effective engagement with their local communities and wider society, leading Gibbs (2004) to propose that universities can re-orient to provide an authentic context for learning, including those learning skills needed to approach an uncertain future. Society will then see the university as a responsible, future-focused learning community. There is extensive literature exploring the notion of learning communities and communities of practice, (Wenger, 1998) and clearly, learning communities provide wonderful opportunities for academic collaborative learning within a university. Learning communities are both implicitly and explicitly referred to in literature describing successful case-studies of education-for-sustainability programmes and there is usually an individual leader who initiates and supports the development of such learning groups.

I am particularly interested in how the influence of appropriate leadership within the university can encourage learning within the context of sustainability and with a focus on learning for sustainability initiatives, recognising that leadership influence is the result of both positional leadership within the university and a personal ability to influence others. These complementary influences are noted also by Black et al. (2006), when exploring the influence bases for learning for organisational success. The importance of effective and appropriate positional, distributed and personal leadership for change, in an institution as complex as a university, is examined in the following section and discussed in more detail in Chapter Eight.

3.5 University leadership for sustainability

3.5.1 Leadership for university sustainability

Increasing global, national and community concerns about the effects of rapid environmental changes on the stability of current social and economic systems has led to an increasing focus on those charged with guiding organisational change in society, with a corresponding interest in the role of leadership. The effectiveness of different modes of leadership for changing management, operational practices, research and learning pedagogies to more sustainable practices in universities is inextricably linked with the leadership role that universities perceive they have, and state through their mission and vision statements.

In his conclusion to *The Sustainability Curriculum – The Challenge for Higher Education*, Cullingford (2004:251) comments that universities need a sense of purpose beyond mere survival, and asks “if universities do not deal in an intelligent way with the central questions of our time, who will”? Cullingford maintains that universities have a choice to either continue making money for themselves and their students, or become engaged in addressing the larger issues of our time, including sustainability and globalisation. Many other authors including Corcoran and Wals (2004), Filho (2002a, 2002b), Sterling (2004) and Tilbury (2005) agree, arguing that if universities are to remain credible as places of ‘higher learning’ then learning and action for sustainability could provide the mission and focus needed to manage the continually changing circumstances that educational institutions face.

There are many inherent problems, in times of rapid change, including not having time to evaluate the many new initiatives that universities become involved in, in response to actual and perceived external and internal needs. This constraint, in conjunction with others, leads Cullingford (2004:18) to reflect a concern shared by those within the academy, when he wonders “if there is anything sustainable about continual, radical transformation”. Certainly there are considerable implications for university leadership, policy makers and planners in universities that are aiming to achieve change, through reorienting curricula and management systems towards more sustainable learning and practices.

In *Learning to Lead in Higher Education* Ramsden (1998:3) contends that “we have seriously underestimated the power of leadership in higher education” and suggests that academics should be more prepared to learn how to lead. He focuses on academic leadership, primarily at the departmental level, linking this to faculty, management and governance levels of leadership and from theory and his research provides leadership principles for enabling better academic teaching, research and learning outcomes. Ramsden is strongly of the opinion that learning and leadership in universities are inseparable, concluding his final chapter with a claim that the future success and survival of universities “will depend on leadership which recognises that transformation through learning is no more and no less than the entire business of higher education” (ibid.:268).

3.5.2 Leadership models and frameworks

Joseph Rost (1993) in his seminal work *Leadership for the Twenty-first Century* examines the literature pertaining to the emerging discipline of leadership studies, from the mid 1900s through to the 1990s, exploring contributions that focus on different aspects of the phenomenon of leadership as situated within an industrial paradigm of leadership. Rost argues that a different style of leadership, as practised by those who ‘lead’, is required, suggesting a new post-industrial definition of leadership:

Leadership is an influence relationship among leaders and followers who intend real changes that reflect their mutual purposes (ibid.:102)

According to Rost, “the definition of leadership given above includes four essential elements:

1. The relationship is based on influence,
2. Leaders and followers develop that relationship,
3. Leaders and followers intend real changes, and
4. Leaders and followers develop and have mutual purposes.” (ibid.:104)

Rost maintains that it is only when *all four* essential elements are present that the phenomenon is leadership, and discusses the rationale for and meaning of the different parts of each element. This includes using the term ‘followers’ as people who are actively involved in, and can influence, the process of leadership, beyond the industrial paradigm of passive subjects, to be wooed and coerced. Rost aptly

points out that these essential elements will be crucial for assisting societal transitions to a post-industrial paradigm, and I believe they are the elements of leadership needed for transitions to sustainability, a post-industrial paradigm for the twenty-first century.

Leadership is defined by Northouse (2004:3), and often quoted by other researchers as being “a process whereby an individual influences a group of individuals to achieve a common goal”. Northouse suggests that leadership may be assigned or emergent and that it is about adaptation and constructive change. He describes (ibid.:198) transformational leaders as individuals who engage with others and “are recognised as change agents who are good role models, who can create and articulate a clear vision for an organisation ... and who give meaning to organisational life”.

Change agents within the university may be traditional positional hierarchical leaders, such as vice-chancellors, deans or department heads or individual teachers, management or operational staff or students. In some universities, for example Harvard, Yale and Victoria (in British Columbia, Canada) individual sustainability leaders, with transformational leadership qualities have been specifically employed to begin influencing the learning and acceptance for institutional change to more sustainable practices, as described by M’Gonigle and Starke (2006) in *Planet U - Sustaining the World. Reinventing the University*.

Astin and Astin (2000:1) in *Leadership Reconsidered: Engaging Higher Education in Social Change* claim that higher education educates new generations of leaders and university academics “exert important influences on the leadership process through their research and scholarship, which seeks both to clarify the meaning of leadership and to identify the most effective approaches to leadership and leadership education”. According to Astin and Astin, academics who take up university positions in order to teach do so because they are interested in contributing to the development of students as learners. Furthermore, academic teachers “see themselves as encouraging students to create their futures by preparing them for a range of unforeseen challenges that lie ahead” (ibid.:43).

This claim may be true for some universities and teachers; however, other authors contend that university teaching is still primarily filling the student with disciplinary knowledge, without interdisciplinary, student-centred, collaborative learning opportunities for co-creating knowledge for a different future, effectively sustaining non-sustainability (Sterling, 2001). Despite this, if they wish to, any academic has the individual opportunity to begin changing their teaching practice and exercising some leadership for learning for sustainability.

Many recent publications, for example *The Sustainability Curriculum. The Challenge for Higher Education* (Blewitt and Cullingford, 2004) and *Teaching Sustainability at Universities* (Filho, 2002) describe a variety of Higher Education case studies where new sustainability learning initiatives are successfully embedded into academic programmes. In all cases the importance of support from university leaders has been essential, whether the curriculum changes have been integrated or developed as stand alone modules, courses, programmes or part of the generic core requirement for learners.

3.5.3 Leadership – attributes needed for change

Researchers contributing to building further understanding of what leadership entails describe the many attributes and skills that leaders need, leading to definitions and descriptions linked to their preferred leadership model. According to Storey (2004) there are multiple and evolving theories of leadership and there are five critical factors in particular; context, perceived leadership need, behavioural requirements, capabilities, and development methods, that are essential to consider when analysing organisational leadership. Storey (ibid.:9) contends that the basic propositions of transformational leadership are contentious and that it is the critical issues of integrity, capabilities, development opportunities and the link between leadership and strategy, and other issues, that need to be examined more closely. Authors exploring leadership for this century point out that those issues are in fact part of the qualities of transformational leadership. Parry (2001a) argues that for Australasian leaders of organisations there are some differences, including acknowledging that charismatic qualities are less important. These differences are discussed in more detail in Chapter Six, section 6.3).

In their review of numerous contributions to the literature on leadership, Alimo-Metcalfe and Alban-Metcalfe (2005:53) discuss the emergence of different models of leadership, commenting that “leadership, particularly ‘new paradigm leadership’ is seen primarily as a social influence process”. They describe general changes in the focus of formal studies on leadership, since the 1930s, particularly during the organisational changes that occurred during the 1980–1990s, leading them to suggest that it is time for a new direction to be taken in leadership research.

Their research considered a number of key factors of transformational leadership, as identified in the literature and lead them to posit a ‘New New Paradigm’ model of thinking for leadership research, in order to “begin to address some aspects of this ‘new world order’” (ibid.:67). Alimo-Metcalfe and Alban-Metcalfe’s research focuses on the dimensions of transformational leadership, and compares different models of leadership behaviour, particularly the United States’ more ‘charismatic’ inspirational transformative model and the United Kingdom’s organisational transformational leadership with its greater focus on “connectedness and inclusiveness” (ibid.:63). They note that “notions of leadership are strongly affected by social change” (ibid.:65) but their research does not extend to investigating the role of external influences on leadership behaviour, nor the role of ‘followers’ (Rost, 1993) in enabling transformations to occur.

According to Alimo-Metcalfe and Alban-Metcalfe, most leadership models were developed about 20 years ago and some models focus more on business leadership and others on communities. The researchers contend that the models developed were dependent on the types of data collected, whether interviews or perceptions. Using grounded theory methodology they developed a Transformational Leadership Questionnaire for their study, and used six factors to measure aspects of transformational leadership in the literature. These factors were:

- Valuing individuals (genuine concern for others’ well-being and development)
- Networking and achieving (inspirational communicator, net-worker)
- Enabling (empowers, delegates, develops potential)
- Acting with integrity (consistency, honest and open)
- Being accessible (approachable, in-touch)
- Being decisive (decisive, risk-taking).

Their 'New New Paradigm' goes beyond current transformational models, by incorporating suggested "fundamental themes of 'servant-hood', connection, transparency and partnership". They argue that their model "appears to be highly conducive to enabling us to begin to address some aspects of 'this new world order'" (page 67), referring to the fact that our society faces extraordinary challenges amid rising social concern with the 'visionary charismatic' leadership, where it has led to religious fanaticism and corporate scandals.

The importance of leadership involvement in 'sculpting' a shared vision, and therefore a shared meaning of professional work-role processes, is stressed by Alimo-Metcalfe and Alban-Metcalfe. Furthermore, they note the importance of leadership being "sensitive to the agenda of a wide range of internal and external stakeholders, rather than seeking to meet the agenda of only one particular group" (page 63). This is in addition to the theme of connectedness and inclusiveness, which is pervasive in their UK data. These and other components are recommended as guides to meeting developmental needs and informing selection processes for leadership.

Porter and McLaughlin (2006) undertook an extensive review of the leadership literature, from 1990 through to 2005, exploring whether leadership research is adequately addressing the effects of external and internal contexts on the effectiveness of organisational leadership. They remind readers that as well as contexts influencing leadership, the organisational context can be changed by effective leadership, arguing that "organisational context can be a dependent variable of leadership action as well as a variable of influence on leadership" (ibid.:560).

Both external and internal factors directly and indirectly influence both the mode of leadership expected and sanctioned within an organisation and the style of leadership looked for by wider society. The important question is whether university hierarchical leaders are responding to external societal wishes to engage more urgently in learning for designing and engaging in more sustainable practices.

There is increasing evidence of fragmented sustainability initiatives initiated by distributed sustainability leaders in universities, as evidenced by the increasing number of previously cited edited collections of case studies of education-for-sustainability initiatives, but there appears to be little published evidence of strategic leadership support for pervasive capacity building and increasing sustainability initiatives across the university. Moore et al. (2005), M'Gonigle and Starke (2006) and Sterling and Thomas (2006) are some of the relatively few scholars who involve themselves in discussions about the value of strategic leadership support for building more capacity and opportunities for new teaching and learning for sustainability.

Despite the successful efforts of individual academic leaders to introduce changed pedagogical and research practices for student learning, these initiatives usually remain isolated case-studies within the university. According to Taylor (1998) the university is so fractured that 'lone-ranging' – the important work of isolated enthusiasts – is considered to be inadequate to enable institutional change, in universities in uncertain times. This situation holds, no matter how strong is the individual's commitment and expertise. Taylor suggests that without institutional support, the work of innovative 'lone-rangers' fails to lead to substantive re-design of university culture.

Taylor proposes another strategic approach for institutional change, based on "appropriation of the innovations of the 'lone rangers'" and provides a five phase process for consideration. He adds 'appropriation' as a fifth phase to Kolb's (1984) cyclic experiential learning process – act, review, theorise and plan. Taylor's 'appropriation' involves five stages: orientation, adoption, evaluation, innovation and institutionalisation which, he contends, can offer lone-rangers' initiatives more possibilities for engaging university colleagues in collaboration for constructing new knowledge.

However, despite Taylor's enthusiasm for this process being useful, leading to institutional change with, for example, communication and information technologies, he places little emphasis on sharing a vision. The steps taken are more managerial and aimed at improving a pedagogical delivery 'practice', rather than a process for

understanding how pedagogical teaching and learning may more effectively enable a cultural change towards a new paradigm.

The many problems facing bureaucratic leaders in times of crisis management are explored by Boin and Hart (2003), leading to their argument that there are only small opportunities for reform in the wake of a crisis, and the conclusion that “the requisites of crisis leadership are at odds with the requirements of effective reform” (ibid.:544). Given the global consensus (Stern, 2006; IPCC, 2007) that climate change, the symptom of accelerating global warming due to non-sustainable practices, is resulting in rapidly increasing numbers of environmental and social crises it may be wiser to plan *now* for timely transformational changes, rather than wait for political intervention or decree to compel teaching and learning changes within the university.

It appears that for effective reform to take place, leadership needs to be effective, and may need to be both strategic and bold. The situation in which a number of sustainability leaders currently find themselves can be illustrated by the oft-quoted ‘Deming’s dilemma’, that is:

The ultimate curse is to be a passenger on a large ship, to know that the ship is going to sink, to know precisely what to do to prevent it and to realise that no one will listen. (O’Toole, 1995:158).

Given accelerating environmental and associated social problems, resulting from decades, if not centuries of non-sustainable practices, there is an imperative to find timely ways of influencing changes in practice, in order both to reduce (long-term) and to mitigate (short-term) the increasing impacts of non-sustainable practices. The health sector is one sector where society is asking for a rapid response to escalating health issues affecting more, and younger, people and there is expanding research into leadership in the health sector.

Following the success of effecting institutional change in Medical Education, through the Interdisciplinary Generalist Curriculum Project, Skochelak, et al. (2001) explore the importance of supportive leadership from the top levels while fostering participation, and central (rather than departmental) administration, amid other

processes that enabled the project to succeed. They conclude that a key element in the project's success was strong support at the highest levels of the organisation. The organisational literature is univocal that support from hierarchical leadership is essential to the success of large projects.

3.5.4 Linking leadership in the university

In *The Ecology of Leadership: Adapting to the Challenges of a Changing World*, the authors (Allen et al., 1998:62) comment, "Leadership based on position and authority is inadequate for the challenges we face today." In fact, because of the speed of change and the need to adapt to those changes they conceptualise leadership that is "based upon ecological principles, individual responsibility and the development of human capacities". In his recent book *Blessed Unrest*, Hawken (2007) argues strongly for the role of individuals, uniquely and collectively in social movements to 're-imagine' relationships between humans and their environment. Given that the fundamental challenge for future sustainability is restoring, safe-guarding and equitably using ecological systems on which all life depends, this description does have a certain resonance. However, within an educational organization such as a university, where hierarchies of power continue to affect those involved in distributed leadership initiatives, it appears that individual actors also need hierarchical support to fulfil sustainability goals, just as nominated leaders need support from those around them to fulfil their goals.

Leaders rely on many other people to fulfil their responsibilities and ensure that they remain accountable to their organisational membership, funders or professional colleagues. Gronn (2003:288) draws attention to the "reality of distributed practice" in educational organizations, as exemplified by the personal assistants, executive officers, deputies and collegial advisors appointed to assist vice-chancellors, deans and heads of departments within a university. Gronn notes that educational organisational leadership is of "an inherently distributed nature", partly due to the fairly "flat" organisational structure of educational schools and institutions and argues that within the university, changes towards a sustainability paradigm will depend on the strength of the connections of distributed leaders needed to deflect and overcome the challenges, discussed in Chapter Seven. Diverse and distributed leadership connections are likely to be strengthened by developing and engaging in

communication networks and facilitating the boundary interchanges between the different communities of practice within the university.

Contributors to the leadership discourse all acknowledge the changes in leadership concomitant with transitions from the industrial age, with a focus on authoritarian leadership to the current knowledge-based organisations with a range of emerging leadership concepts, for example dispersed leadership (Gordon 2002), distributed leadership (Gunter and Ribbins, 2002), and shared leadership (Pearce and Conger, 2003).

In relation to the university as an organisation, ‘distributed leadership’, connected to university ‘hierarchical leadership’ bears most relevance to both my research findings and my personal experience with leadership. I discuss this in more detail in Chapter Six, when explaining my theoretical framework for connecting sustainability leaders. The relatively new scholarly concept of shared leadership is also discussed, with particular relevance to the challenges this faces in a university where the majority of teaching remains ‘held’ within disciplines.

The reality of changing organisational structures is resulting in further research into leaders and leadership for this century, and the literature reveals growing support for new models of leadership that better fit the creative and globally connected ‘knowledge-economy’. Complexity science, for example, led Uhl-Bien et al. (2007) to develop their framework for the study of Complexity Leadership theory, including ‘three entangled leadership roles’, those of administrative, bureaucratic and other informal systems, resulting in a ‘a complex interactive dynamic’. Despite this concept sounding relevant for a large multi-layered university organisation, I argue that the complexity of the theory makes it difficult to engage with, from a practical operational point of view.

There are current models of leadership and frameworks for strategic leadership more likely to resonate with university leaders for sustainability, for example transformational leadership (Alimo-Metcalfe and Alban-Metcalfe, 2005). Berson et al. (2006:578) review leadership work as it relates to organisational learning,

reflecting that “to date, there is limited systematic research directly linking leadership and learning”. In contrast, and as noted by Berson et al., theoretical work by Vera and Crossan (2004) focuses on both transactional and transformational strategic leadership approaches to organisational learning and they suggest that the transformational leadership inspires explorative learning approaches for new possibilities.

I would suggest therefore that a strategy of connecting leaders for sustainability will offer collaborative learning opportunities that, in conjunction with a transformative leadership influence, may lead to transitions in organisational learning for change, especially where there is a coherent vision or goal for a sustainable future for all.

3.6 Summary

In this review I have focused on literature representing the debate and discourse on education-for-sustainability, as a new context of learning for university education. There is steadily increasing scholarly and societal engagement with educational practices that will enable transitions towards a new paradigm of sustainability, for maintaining quality of life in the twenty-first century. I have examined the growing evidence, in the literature, of successful programmes for education-for-sustainability in international universities, before exploring the challenges and barriers to implementing education-for-sustainability in universities.

As my research progressed, this review widened, exploring the relevant literature on leadership, as prompted by research findings, revealed themes and theory that emerged as a result of the research methodology I have used.

In the following chapter I provide an explanation of the research methodology used; namely grounded theory methods for analysing and interpreting qualitative interviews with thirty academics from 21 universities. In Chapter Seven I discuss the role of universities in contributing to education-for-sustainability, and the challenges to changes in educational practice, with reference to the themes that emerged from research and more of the relevant academic literature.

CHAPTER FOUR

Research Design and Methodology

There is nothing like looking, if you want to find something. You usually find something if you look, but it is not always quite the something you were after.

J.R.R.Tolkien (1937)⁷

4.1 Introduction

As discussed in Chapter Three, growing numbers of scholars argue that the inclusion of planned, appropriate learning for sustainability initiatives potentially provides those authentic learning experiences that will enable students and their communities to adapt to the increasing social and environmental challenges. This argument is supported by numerous declarations and statements, as outlined in Chapter Two.

In this thesis I chose a “grounded theory” methodology to reveal key reasons for the differences in opportunities for sustainability learning between two sub-sets of selected universities, international and Aotearoa New Zealand. This chapter describes the research approach taken, with reference to the literature examining qualitative research, particularly grounded theory. I relate the design of my research to the initial research problems and questions then explain how the process of analysis, using grounded theory methods, leads to key findings, themes and in this study, an emergent theory.

The development and focus of this research goal is a natural progression from my two decades of involvement in advocating for and now working in the field of education-for-sustainability. It is important, therefore, that I acknowledge the potential of inherent bias. Researchers, especially those involved in qualitative research projects, recognise and comment on the premise that research is never essentially ‘value-free’ because every researcher brings their own interpretations and preconceptions to the problem being researched.

⁷ Tolkien, J.R.R. 1937. *The Hobbit*. London: Allen & Unwin.

According to Denzin (1989:23) “value-free interpretive research is impossible” while Lather (1986:257) maintains “just as there is no neutral education ..., there can be no neutral research”. Any interpretation of research depends on the values and assumptions of the practitioners involved, and the previous experiences of the researcher always have an influence on the research. Even the most rigorous analytical scientific data collection is the result of selective choices that are made, for example; where and how to sample, what to exclude and what parameters of the sample to investigate.

Therefore it behoves the researcher to be aware of this and acknowledge both the known and unknown influences that affect the progress, analysis and conclusions drawn from the research. I recognise that my life experiences and declared values and beliefs have affected my choice of research, and could, if not acknowledged and accounted for, have affected the reliability and validity of data, my interpretations, and thus the development of my theoretical framework for leadership for sustainability.

Consequently, I chose to use Glaser’s (1992, 1998) grounded theory methodology, with emphases evolved from the original grounded theory methodology of Glaser and Strauss (1967). According to Charmaz (2000:507) “the term ‘grounded theory’ refers both to a method of inquiry and the product of inquiry”. I focused on keeping an open mind and checking constantly that emerging themes could be tracked and related back to the original data. Using grounded theory methods I engaged in iterative data analysis, constantly comparing data with data, progressing to comparisons between categories of data then re-visiting initial data, re-categorising and seeking verification within the data. These methods lead to identifying the ‘central phenomenon’ from within the data, and kept emergent theory grounded in participants’ experiences.

As research progressed and themes emerged I began reading academic literature in fields of scholarly study that were new to me, moving beyond my initial scoping focus on finding successful and appropriate implementation ‘methods’ that could be adapted by our national universities into the field of university leadership. This in turn led to the development of my theoretical framework (Chapter Six) for helping sustainability leaders develop new learning initiatives for sustainability outcomes, within universities in Aotearoa New Zealand.

In this chapter I review the focus of my study and my initial beliefs and assumptions that preceded my analysis of the results. I clarify the research questions (section 4.3) and in section 4.4 introduce the research methodology and the procedures I used for data gathering. The research methods – the integral components of grounded theory methodology – are described in section 4.5 and include an explanation of the iterative coding, analysing and re-coding that enabled the emergence of key themes, leading to constructing a conditional matrix. This matrix enabled both further analysis and comparison with initial data, providing ongoing validation and verification (as explained in sections 4.6 and 4.7) for my emerging theory.

Through using grounded theory, I identified the key to the phenomenon being investigated, as summarised in section 4.7 and elaborated in Chapter Five.

4.2 Focus of this research

When scoping this thesis I noted that in Aotearoa New Zealand, there were few opportunities for university students to enrol in programmes that offered substantive learning for sustainability (Chapter Seven). There are environmental degree programmes that offer individual course papers with a focus on specific sustainability issues but I could find few opportunities for students to enrol in integrated, coherent courses that included ‘strong sustainability’ learning (Chapter One, page 7).

Following discussions with overseas colleagues and reading emerging literature I noted that there were universities overseas that did offer undergraduate and/or graduate programmes with sustainability outcomes as a key focus (for example; Australia, United Kingdom, some European countries and the United States in particular). Therefore I was keen to explore how our universities could be encouraged and enabled to do likewise.

In Aotearoa New Zealand there are individual, passionate and dedicated teachers aware of the need for better understanding of current and predicted sustainability issues, some committing considerable intellect and effort towards obtaining support for establishing wider university programmes, with limited success. I hoped to find a ‘magic bullet’, a generic process of development and implementation that individual

‘sustainability leaders’ within the university could use to improve university sustainability learning initiatives opportunities in Aotearoa New Zealand.

While reflecting on why universities are failing to provide substantive learning for sustainability I wondered whether this might be universities were failing to support new education initiatives because of the culture of protectionism surrounding different disciplines, or whether collaborative inter-disciplinary programmes faced funding problems because of low levels of sustainability literacy. I also speculated that lack of knowledge about sustainability issues might result in university management structures blocking inter-disciplinary teaching opportunities and holistic sustainability initiatives.

However, during my initial scoping interviews I learned more about perceived and actual challenges to implementing sustainability initiatives within universities. These challenges reside amid layers of complexity, involving academic communities and culture within the university, including perceptions of external pressures, institutional inertia, resistance to change, and career pathway concerns, to name but a few competing concerns (as discussed in Chapter Seven).

These and other issues led me to investigate the core problems that had been identified and needed addressing in order to establish programmes that included sustainability learning for the future. These problems provided the initial framework for choosing my research methods.

4.3 Research Problems

I selected four research problems that needed addressing, in order to reach the level of understanding I required for offering explanations for:

- the underlying reasons for the current low levels of ‘sustainability learning’ in universities in Aotearoa New Zealand, and
- the key processes most likely to lead to implementation of programmes for learning for sustainability in universities.

The research problems I chose to focus on are:

- 1 What are the key barriers and challenges encountered when developing new university courses with significant learning opportunities for understanding [strong] sustainability issues?**
- 2 What processes had been successfully used, and how were they progressed to overcome these barriers and challenges and establish [strong] sustainability learning programmes?**
- 3 What are the generic key processes and associations, or relationships, within the university community that need to be understood when planning and developing new sustainability learning initiatives?**
- 4 How can university academics be encouraged and empowered to use processes and procedures leading to sustainability learning initiatives, for themselves and their students?**

The methodology I selected uses a strategic mix of research methods in order to answer the following focused research questions. Patton (2002:253) maintains that combining methodological strategies is useful for creating inquiry strategies more likely to generate “creative research adaptations to particular settings and questions”.

Six guiding research questions were developed to elicit answers to the research problems and thus yield insights into key themes and factors that might assist solving some of the difficulties facing those seeking to implement new sustainability learning programmes. These questions were embedded in the semi-structured interviews and guided all aspects of my data collection.

Research Questions:

To address problem one, the first two questions are:

1. What are some examples of successful programmes for learning for sustainability at international universities?
2. What were the barriers and challenges faced by the academics involved in developing and implementing these new sustainability programmes?

Problem two is addressed by the third and fourth research questions:

3. How were these barriers and challenges overcome?
4. What were the key processes and/or actions undertaken that were instrumental in moving beyond the challenges?

The fifth research question addresses problem three.

5. What were the key combinations of processes and associations (or relationships) that secured the support needed for implementing new sustainability learning initiatives?

The applied research question six addresses problem four.

6. How could Aotearoa New Zealand universities use the understanding and learning derived from this research to initiate and make progress on present and future initiatives for learning for sustainability?

This study aims to find answers to the research questions and from these develop a theory, implicit in the data, as well as grounded in the experiences of practitioners and participants in this research. This theory will contribute to the debate, in academic and popular literature, of how best to support the implementation of learning for sustainability in universities.

My theory emerges from the conceptualisation of the actions and connections revealed during formal interviews, conversations, university curriculum and operational management data gathering and a review of a wide range of relevant, multi-disciplinary literature. This theoretical model acknowledges relationships (and synergies) to current theories, for example community of practice, transformative leadership and agents of change, and provides further understanding of how active connections and relationships within the university community can help the creation of new learning opportunities.

My hope is that teachers, researchers, scholars, management and operational staff will find the model valid and useful for progressing learning for sustainability initiatives, in universities and other tertiary institutions, especially in Aotearoa New Zealand.

4.4 Research epistemology and methodology

4.4.1 Epistemology

Epistemology refers to the theory of knowledge embedded in the theoretical perspective, the philosophical stance informing the methodology, providing a context for the research process and grounding its logic and criteria (Crotty, 1998:3).

According to Mills et al. (2006:1) “researchers must choose a research paradigm that is congruent with their beliefs about the nature of reality”. I embrace an ecological paradigm where multiple connections, feed-back systems and changing relationships between living species and their biophysical environment reflect multiple realities, continually influenced by different contexts. Accepting that all concepts should be understood as relative to other paradigms, cultures and norms places me in a relativist ontological position (Guba and Lincoln, 1994).

When seeking a research methodology that would provide an ontological and epistemological fit with my philosophical position I explored grounded theory, acknowledging the possibility of organising data in an inductive, constructive way while using participant voice to reconstruct multiple linkages and uncover systematic themes.

Ontologically and epistemologically a constructive grounded theory approach (Charmaz, 2000) acknowledges the participant experience, a multiplicity of perspectives, and opportunities to reduce researcher bias so that a theory may be constructed from the data (Strauss and Corbin, 1998). According to Corbin and Strauss (1990:5) “grounded theory derives its theoretical underpinnings from Pragmatism and Symbiotic Interactionism”, both of which subscribe to the idea that phenomena are “continually changing in response to evolving conditions” and actors are “able to make choices according to their perspectives, which are often accurate, about the options they encounter”.

Constas (1992:264) suggests that much qualitative research claims to rest on a naturalistic orientation, and as such any approach that relies on a preordained structure (such as the basic categorising, coding and constant comparison of

grounded theory) could be epistemologically at odds with naturalistic approaches. Howe and Eisenhard (1990:3; cited in Constas) argue that “Abandoning positivism does not entail abandoning standards of objectivism and rationality – instead it entails that such standards be understood in a non-positivist way”.

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.

4.4.2 Methodology

Methodology refers to the broad philosophical orientation or paradigm that guides a research study. Denzin and Lincoln (2000:2) discuss qualitative research as “a field of inquiry in its own right. It crosscuts disciplines, fields, and subject matters” and therefore closely reflects the nature of sustainability. Qualitative methods are used for studying issues in depth and detail, and findings can later be quantified, if that is part of the mix of research methods selected. In contrast, quantitative methods use predetermined response categories within which many participant experiences can be ‘fitted’, enabling aggregation of responses and generalisations but lacking opportunities for deeper understanding of causal relationships and complexity of contexts (Patton, 2002).

Patton discusses the advantages of being pragmatic when choosing the appropriate methodologies for specific inquiry situations, because there are certain methods of inquiry that are more likely to produce the type and level of information that will best contribute to creating new understandings about a specific phenomenon. Selecting a portfolio of techniques to draw together a wide range of variables in order to explore complexity is commonly used in qualitative research (Patton:1990). Denzin and Lincoln (2002:6) argue that “qualitative research, as a set of interpretive activities, privileges no single methodological practice over another”, and “has no theory or paradigm that is distinctly its own”.

Four paradigms or methodologies of research are identified by Lather (1992:89), each of which provides a philosophical framework for addressing particular types of research objectives. To summarise, the positivist or empirical-analytical paradigm seeks to predict, the interpretivist seeks to understand, the critical aims to emancipate and the

post-structural to deconstruct. Schwandt (2000) maintains there are three general epistemological positions that can be taken for qualitative inquiry; interpretivism, hermeneutics and social constructivism. Other qualitative researchers do not include 'interpretivism' as a separate paradigm, rather as part of the constructivist and post-positive approach (Denzin and Lincoln, 2005) and others combine different foci from, for example hermeneutics, critical theory and phenomenology (Bentz and Shapiro, 1998). Denzin and Lincoln (ibid.:6) liken the product of the interpretive researcher's work to a "quiltlike bricolage" that is shaped by both the personal history of the researcher and the experiences of those participating in the study.

In this study the interpretivist paradigm underpins the choice of research approaches because the study seeks to provide a better understanding of an identified phenomenon, in this instance, the very limited progress in establishing sustainability learning initiatives in Aotearoa New Zealand universities. It seeks to explain reasons for this phenomenon and leads to theorising how to assist in implementing and progressing university sustainability initiatives. Therefore, qualitative research interviews were chosen as the major research method, because they provide opportunities to cover both factual and 'between the lines' meaning and enable interviewers to obtain confirmation, or disconfirmation, of their interpretation of what the interviewee is meaning (Kvale, 1996:32).

The post-modern interpretive paradigm forms an 'umbrella' for this research, guiding the way in which I approached data collection, chose to use grounded theory methods for data analysis and sought understanding of modes of action that could advance desired outcomes. Given my personal and professional interest in sustainability, a multi-disciplinary concept, and the complex relationships and processes of the modern university, choosing a grounded theory method is very appropriate. Grounded theory methodology is bound neither by methods of data collection nor discipline and is considered useful for multi-disciplinary studies. According to Charmaz (2006), grounded theory methods do not need to be tied to a single epistemology, rather they reflect aspects of positivist empiricism as well as interpretive post-positivist approaches.

In this study, the chosen research methodology follows Glaser's (1992, 1998) grounded theory methodology, as developed from the general 'grounded theory' approach of Glaser and Strauss (1967). This includes an inductive strategy for generating and confirming theory, and constantly comparing data through constructive and interpretive analysis that leads to theory that emerges from the research. According to Patton (2002:128) grounded theory "is best understood as fundamentally realist and objectivist in orientation, emphasising the disciplined and procedural ways for getting the researcher's biases out of the way but adding healthy doses of creativity to the analytic process". He included the notion of 'creativity' to a fundamentally objectivist explanation of grounded theory, reflecting the developing understanding by grounded theory researchers that grounded theory methods can be viewed as partly interpretive, as well as objectivist. Patton further argues that generating theory is a primary purpose of qualitative social science and considers that evaluative, focussed research which aims at intended users (in this case university leaders and academics) can be used for facilitating discussion about effective processes.

According to Schon (1983), such generation of practical and useful knowledge for action is in the tradition of reflective practice. In educational research, reflexivity (the process of critical self-reflection to build self knowledge) is considered to be a key factor needed by academic practitioners in order to successfully plan changes in teaching and learning strategies. Reflective practice by the grounded theory researcher is integral to the process when exploring linkages between new groupings of data while seeking underlying themes to explain action, or lack of it. In this study my reflection on data, literature, then emerging themes coupled with reflective assessment of my personal experience with leadership processes was key to the interpretations that led to developing theory.

Glaser's (1998) approach to research and theory is based on the premise that theory emerges from careful comparison of the properties of the research data collected, so that a theory develops, inductively, as constant comparisons of the data are made. The aim is 'to discover the theory implicit in the data'. Furthermore, Glaser argues that as theory develops, further or alternative methods can also emerge and these can

be used in order to seek clarification and support for the emergent theory as well as seek and provide evidence that questions the reliability of the emerging theory.

Charmaz (2006) discusses Glaser's use of both the objectivist (deriving from positivism) approach to gathering data, and his emphasis on understanding the data through interpretive methods, particularly constructive, inductive methods. This combination of objectivist and interpretivist paradigms is particularly relevant where a general theory is being inferred from multi-site particular instances.

Discussions in Strauss and Corbin (1998) show how positivist leanings in the ongoing development of grounded theory have developed, by acknowledging the place of interpretivist views when they emphasise relationships among concepts. Furthermore Strauss and Corbin consider that a theory means "a set of well-developed concepts related through statements of relationship, which together constitute an integrated framework that can be used to explain or predict phenomena" (ibid.:15) and they observe there is a clear distinction between description and a more abstract and explanatory theory. Charmaz (2006) suggests that theories are rhetorical, whether interpretive or positivist and are more likely to be acknowledged as such by interpretive theorists.

Glaser (2001:15) comments that "a well-constructed grounded theory will meet its four most central criteria: fit, work, relevance, and modifiability". A theory that fits practitioners, researchers and subjects involved in the research area, while explaining variations, will be of relevance to that community. Glaser considers the theory should also be modifiable, able to integrate new concepts. In addition, a theory can provide a frame through which the phenomena can be viewed and an interpretive theory may lead to creating new understandings, through re-interpreting the connections and relationships that originally appeared 'evident'. Using grounded theory methods is akin to using a "guide to interpretive theoretical practice, not [in] providing a blueprint of theoretical products", according to Charmaz (2006:129).

Charmaz argues that interpretive theory rests on interpretation, the understanding rather than the explanation seeking to show connections rather than linear reasoning,

and she provides us with an elegant description: “Interpretive theory calls for the imaginative understanding of the studied phenomenon. This type of theory assumes emergent, multiple realities; indeterminacy; facts and values as linked; truth as provisional; and social life as processual” (ibid.:126).

In an emergent study, once the research situation is available the data collection can be started, before specific relevant literature is accessed. Glaser (1998) argues that when working in grounded theory the literature should also be emergent, in that as soon as themes start to emerge, then literature pertinent to those themes can be considered. Glaser’s concern is that early reading of literature most closely related to what you are researching may result in constraining the researcher’s ability to analyse data and find relationships and understandings that contribute to theoretical understandings beyond those already in the literature.

Using this methodology enables a wide variety of literature to be read and compared to the emerging theory in a similar way to the data comparison being made as more interviews are gathered and analysed. Where anomalies and disagreements between the literature and emerging theory become apparent, then the emerging theory may need to be extended, to that it can make sense of data from both the literature and the research situation. Charmaz (2006:163) presumes that “you return to the library to write your literature review and theoretical framework” after your analysis. In this thesis I have used both these methods: reading and comparing literature during and following analysis.

At all times the data collected, whether from interviews, observations or documents must seek to be honest, meaningful and credible, with a commitment to balance, by reporting any evidence that disconfirms any conclusions that are being offered (Patton, 2002). The understanding that the role of the researcher needs to be one of empathetic neutrality and that potential sources of bias and error need to be reported also contributed to my reasons for choosing grounded theory. I understood that any of my initial ideas, regarding the reasons for the perceived problem, were based on other people’s comments and perceptions of university politics and structures, rather than on actual experience. My closest experience to introducing a sustainability

learning course at university level had been when I had attempted to introduce more environmental sustainability topics into existing educational programmes, while teaching part-time in a polytechnic.

Using grounded theory methodology provided the means to interpret the reported experiences of willing participants and contribute to better understanding of the issues likely to be involved when individuals or institutions develop initiatives aimed at incorporating sustainability learning into universities in Aotearoa New Zealand. This chosen methodology also enabled the emergence of new understandings, for me, of the key role active transformative leadership plays in implementing sustainability initiatives within universities. This in turn led to theorising that active, connected, transformative leadership is needed for enabling changes for education-for-sustainability in universities.

Strauss and Corbin (1998:22) describe the relationship between the inductive process of finding categories, themes and relationships with the progressively deductive process of theorising as “at the heart of theorising lies the interplay of making inductions (deriving concepts, their properties and dimensions from data) and deductions (hypothesising about the relationships between concepts)”. This study uses an iterative process of inductive and deductive analysis, as supported in the literature on qualitative grounded theory methodologies (Charmaz, 2006; Glaser, 2001; Miles and Huberman, 1994; Straus and Corbin, 1998).

This thesis involves both basic and applied research. I employed interviews to document, in participants’ own words, what happened during the development of their sustainability-related teaching programmes. In addition, I conducted an initial literature review, then reviewed the relevant literature emerging during this thesis project. I analysed library, web-based and archival data, to substantiate participants’ verbal recollection of specific teaching courses or events (or policy) that influenced the establishment of their programmes and courses. Some interviewees were contacted by email (December 2007) to check the status of the courses or programmes they had described. Notes taken during the interviews and further discussions with interviewees provided additional information that contributed to addressing the research problems.

Using a range of methods provides opportunities for extracting richer information that can then be explored to develop a deeper understanding of the reasons for events. In the case of grounded theory, the methods themselves can also be emergent, developing in response to the findings (Glaser, 2001). This then enables the researcher to delve more deeply into both the externalities and internal structures that affect participant's attitudes and actions and give authentic context to the findings. During my research I used networking opportunities with other academics (other than participant interviewees) and external researchers working with universities to seek clarification for the reasons university sustainability policies and programmes had been developed.

Charmaz (2006), Glaser (1992), Patton (2002) and Strauss and Corbin (1990) all strongly argue that the development of inductive theory from the qualitative inquiry processes of grounded theory are contributions to basic research. Patton further discusses the contribution of qualitative inquiry to building knowledge, through an applied research process, that will help people better understand the nature of a problem in order to progress their solutions.

Applied research is often guided by the findings, understandings and explanations of basic research (Patton, 2002) and I use my research findings, interpretive explanations and emergent theory to move from basic to applied research when I suggest how academics may find my theory useful to help establish education-for-sustainability in universities.

4.4.3 Interview methods

Interviewing is a popular inquiry method (Patton, 2002) used to gather another person's experiences and thoughts about a phenomenon, while presuming the story will be meaningful and able to contribute to the focus of the study. Some researchers, including Patton (1990) and Roberts (1996), consider that interviews are simply a qualitative technique, along with document analysis, that contribute to any case study that is trying to draw together a number of factors and variables to explain specific processes or links that cannot be readily identified.

In the tradition of grounded theory research I chose to use interviews as my main method of data collection. According to Kvale (1996:14) the qualitative research interview is more than simply a data collection technique; it is, “literally an ‘interview’, an interchange of views” that has a reciprocal aspect because it is exploring a theme of mutual interest. The interview covers both factual and meaningful content, and itself can be favourable for interviewees as it provides them an opportunity to develop new insights from the reflexive process of bringing their thoughts together.

In addition, the benefits to the researcher are more than simply the interview data that is ‘provided’, as a sensitive interviewer will be alert to what actually is not said, hence the usefulness of taking extra notes immediately following the interview. As soon as possible after each interview I recorded my impressions of the interviewee’s manner, level of engagement, passion and apparent willingness to disclose and share information, in order to support more accurate interpretations, of both clearly stated and more subtle comment.

Kvale suggests that the qualitative research interview is a construction site in which knowledge is being reorganised and built. The interviewer herself (even unintentionally) is developing further knowledge and understanding, through critical consciousness of what is being divulged, coupled with reflexivity and comparison with other interview data that has been obtained previously. Such knowledge building is to the benefit of both parties involved in the interview and eventually, hopefully, a wider audience. Therefore I used qualitative research interviews as my main method of data collection (described in detail in section 4.5) because I was seeking processes that could help progress learning for sustainability initiatives in universities.

Kvale also examines critiques of interview research that consider interviews are only explorations, that they do not test hypotheses (ibid.:288). However, as Strauss and Corbin (1990) point out, grounded theory methods (along with other methods) provide the possibility of creating theories, based on personal interviews, and as part of the shared ‘traveller’ (using Kvale’s terminology) experience between interview participants, new knowledge is created.

One interview alone may provide a wealth of data, but analysis of that data remains case-specific. Increasing the number of ‘cases’ allows comparative research analysis, leading to opportunities for more generic understandings across a range of cases.

Stake (1995, 2000) discusses the benefits of having a population of cases for comparison in order to find understanding for a larger question. When a larger question is posed as a problem, the issue becomes one of solving how or why and when the specific unique cases are in an effectively bounded system then there is greater usefulness for developing a generalisation.

Miles and Huberman (1994:29) argue that “an explicit *sampling frame* is needed ...” guided by the research questions and conceptual framework – either pre-specified or emergent”. In this thesis, the sampling frame is the bounded university system and there are thirty individual ‘cases’ that make up the multiple-case population. These cases contribute both to the whole study and also are analysed as two groups, for comparative purposes. My emphasis is on the collected case-studies rather than the particular, intrinsic cases (Stake, 1995).

Multi-case studies more easily lead to generalisations (and possible extrapolations) and transferability of findings (Patton, 2002). Most qualitative researchers, including Miles and Huberman (1994), Patton (2002) and Stake (2000) comment on the importance of context, in relation to analysis. In this research both internal and external contexts are referred to in my analysis and discussion. According to Lincoln and Guba (1985:124) “the degree of *transferability* is a direct function between the similarity between two contexts, what we shall call *fittingness*”.

The first group with a shared context is twenty international university teachers who, despite working in different schools and departments within universities on different continents have had real, grounded experiences in successfully developing, implementing and teaching learning for sustainability degree programmes. The second group is ten Aotearoa New Zealand university teachers who have experience in teaching papers and courses with a sustainability focus, and an interest in developing new sustainability learning programmes.

Roberts (1996) identifies two particular issues with case study research in educational settings, particularly where there is a limited number of 'cases'. First he considers it is essential for interpretation to be made from the full results of all the case studies and that a 'case' should never be described as typical. According to Miles and Huberman (1994:29) "multiple-case sampling adds confidence to findings", because if a finding in one setting "also holds in a comparable setting but does not in a contrasting case, the finding is more robust".

I chose to analyse the international group and the Aotearoa New Zealand group as two separate sub-populations, because the former were involved in teaching in substantive sustainability learning programmes, the latter only in a few course papers within their discipline. The congruence between these two groups, as well as the differences in relation to their contexts is discussed during my analysis of the research findings.

A second issue Roberts (1996) identifies is the possible conflict between the rights for participant responses to be kept confidential and the rights of society to gain knowledge and understanding. For this reason names and affiliations need to be changed, unless permission has been given, freely, for real identifications to be used in the research reporting. In this research I use numbers (1 – 20) for interviewee responses, and codes (I = international and NZ =Aotearoa New Zealand) to compare the two sub-groups of the population and further discuss these responses in Chapter Seven.

Stake (1988) suggests a third issue that can arise and that is the discrepancy between what the participants and observers or interviewers believe should be reported. To reduce opportunities for discrepancies, I forwarded the participants the written transcript of their interview to check for any errors such as naming of persons, courses and research studies that arise because the listener and transcriber are unfamiliar with the specific names, acronyms and terminologies being used.

Later, any sections of writing that contained anonymous comments or quotes were checked against the original transcripts, in order to check for discrepancies in my

interpretation of what was meant by the interviewee's words, given the context in which they were now being used. Before submitting the final draft, sections of chapters containing any identifiable comment, for example a 'personal communication' quote, were forwarded to the appropriate person seeking permission to use the statement in the context of the thesis chapter.

4.5 Research Methods

4.5.1 Purposive sampling of participants

Most research that involves more than one individual event, organism or participant is effectively sampling only a section of the population of interest. The number of samples depends on the intent and purpose of the research, whether a market survey requiring a large number of respondents or a smaller number of individual case studies aimed at uncovering specific issues facing a group of people, for example first year teachers in a specific tertiary institution.

There are good reasons and many advantages for using purposeful sampling to select 'information-rich' participants, an obvious fact being that interviewees who have had no personal experience in the chosen field of research can provide only an 'opinion' or observation rather than actual experience-based insights into a situation. Choosing information-rich cases for a research study provides the opportunity to learn a great deal about issues of central importance to the research (Patton, 2002:46). Furthermore, purposeful sampling enables time to be spent effectively pursuing in-depth understanding of a specific phenomenon, in this case the associations and processes that enabled the development of sustainability learning programmes in universities.

During scoping for this thesis, I identified steadily increasing numbers of international universities that offered learning for sustainability programmes to their students. Most of the sustainability programmes reported in the literature were from the United States with some from Australia, Canada, Europe and the United Kingdom and very few or none reported from other countries, as evidenced in collections of case-studies (Filho, 1999, 2000, 2002a, 2002b; Thompson, 1997).

The U.S.A. has a wide range of colleges and universities with learning for sustainability programmes, many of which are documented in recent literature (Bartlett and Chase, 2004; Blewitt and Cullingford, 2004; Filho, 1999, 2000, 2002b; Filho and Carpenter, 2006; Forrant and Silka, 2006; Rappaport and Creighton, 2007). However, the institutional organisation, degree structures and levels of funding and endowments in many universities in the United States are very different to those in Aotearoa New Zealand. I concluded that lessons learned from those universities may not be easily adapted for implementation of sustainability programmes in our universities.

Therefore, I chose to interview university teachers from Australia, Canada, the United Kingdom, Germany and the Netherlands. These countries are represented in the academic literature exploring tertiary education-for-sustainability and have university education systems more akin to Aotearoa New Zealand. I used my prior knowledge and contacts within my network of colleagues to initially engage with selected academic participants, and also informally discussed what I was planning to do with sustainability-focused researchers at other universities and international conferences.

In effect, I was entering a relatively small and slowly enlarging circle of intellectual capital, leading to finding more participants through an emergent snowballing process (Patton, 1990).

This resulted in choosing twenty lecturers teaching in integrated sustainability learning programmes, including eight in Australia, six in Canada and two each in the Netherlands, Germany and the United Kingdom. All interviewees had experience in developing sustainability learning programmes. They represented a range of different schools within university faculties. These academics were invited to participate in face-to-face, semi-structured confidential interviews, conducted during the twelve-month period from April 2005 to March 2006.

Interviews were also conducted with ten lecturers involved in the development and teaching of courses or papers with a sustainability focus, in four of the eight universities in Aotearoa New Zealand. These academics were selected because I knew, from collegial conversations and the literature, that they were involved in

education-for-sustainability in their universities. These interviews were conducted over five months, from August to December 2006.

An interview guide was used to ensure the same basic lines of inquiry were pursued as well as providing flexibility for the interviewer (Patton, 2002). Each semi-structured interview incorporated closed questions to provide empirical data that can be checked against document analysis. Most questions were open-ended, enabling issues to be further explored and providing the opportunity to elucidate answers that need clarification. Interview questions that are open-ended provide opportunities for participants to share their deeper understanding in greater detail.

Interview questions (see Appendix 9) were selected to identify:

- the types of sustainability learning programmes each interviewee is involved in (closed question)
- why those programmes were developed
- what challenges were met, if any, during their establishment
- what processes were used to overcome the challenges, and
- what key processes enabled the sustainability education initiative(s) to succeed.

The interviews aimed to inform and provide a focus on process, looking at *how* something happens, in particular how the participant/actor in the development initiative formed associations and engaged with other participants/actors to reach the critical level of support required for a new learning initiative to be accepted. In cases when the interviewee added additional thoughts and insights after the recorded interview their permission was sought to add those comments to the data.

In addition to the semi-formal interviews, and using the snowballing method of seeking further interviewees to elaborate, confirm (or deny) the relevance of certain areas of interest, eight informal, shorter interviews were conducted with interested academics at the workshops previously referred to, concentrating on questions regarding the role of leadership processes used for successfully establishing new sustainability learning initiatives. Also, in three universities I held informal

discussions with academics from teaching and learning departments about their provision of professional development pedagogical opportunities for lecturers.

During and following my research interview trips (2005 and 2006) I attended several meetings held in government institutions involved with promoting environmental and social sustainability issues and where comments and insights were shared about teaching and learning for sustainability initiatives within seventeen universities in Australia, Canada, England, Germany and the Netherlands. At these meetings I took notes and asked questions to inform my understanding and check the reliability of the data I was gathering from my research interviews with academics in those countries.

In addition, I explored issues of university sustainability teaching with other international academics, including Americans, with whom I interacted when attending international workshops and conferences: including the UNU-APEC Education Network on Education for Sustainable Development, held in Yokohama, Japan in 2004 and the Third World Conference on Environmental Education (3WEEC) held in Turin, Italy in 2005. As a result of presentations at those meetings, I was invited to participate in two leading sustainability-focused ‘think-tanks’: the Balaton Group⁸ Meeting in Hungary and the Sustainable Development Forum in Germany, both held in September 2006.

Discussions and debate about sustainability and education issues with international participants at the 2006 The Balaton Group were extremely valuable, providing further insights and contributing valuable critique of my ideas, while confirming the findings emerging during analysis of my international interviews. Further discussions about education-for-sustainability in universities took place while attending the Australian Association for Environmental Education conferences in 2003 and 2005 and conferences of the New Zealand Association for Environmental Education, in 2004 and 2006.

⁸ The Balaton Group was founded in 1982 by Donella Meadows and Dennis Meadows, co-authors of the 1972 report *The Limits to Growth*. It was created as an international ‘networks of networks’ for leading researchers on resource use, environmental conservation, systems modelling, and sustainability and strongly supports the development of emerging sustainability leaders.

4.5.2 Interview processing

Ethical approval was obtained for the research interviews (Appendix 6) from the Victoria University Human Ethics Committee and an information sheet (Appendix 7) was sent in advance to the thirty research participants, and made available at the interview. Individual participants' transcribed interviews were forwarded to them for checking for factual mistakes or misunderstandings or general comment, if they wished.

Interviews were recorded, using a digital voice recorder, then converted through digital editor to voice files on the computer, copied onto a CD, then transcribed by a professional transcriber. When the transcriptions were received as word files, I checked their accuracy against the CD voice files and any obvious errors were corrected before the appropriate word document was forwarded to each interviewee for them to check.

After most of the overseas interviews had been transcribed, and interviewees had sent in any corrections of names or interpretations, eight transcripts were selected upon which to begin the organisation of information into 'coded' categories, with the understanding that as more interviews were added, more categories would probably emerge. Each transcription was printed then divided (using scissors) into sentences, sequences of sentences or paragraphs that described separate processes, issues or events.

Coded folders were organised and decisions made as to which coded folder (e.g. policy, funding, or leadership etc.) to place the information. Initially the number of categories reflected the expected areas of interest and issues; however the number of coded categories increased from twelve to seventeen, then nineteen, as more data was prepared, sorted, then coded for further analysis.

Due to the increasing amount of detailed data, some categories were sub-divided further, as analysis revealed groupings that reflected specific themes within those general categories, resulting in 27 categories, as listed in Table 1, page 114. An example of splitting categories is sub-categorising University Supporting Structures

(USS) into Forums (USF), Institutes (USI) and Committees (USC) as these sub-groups showed specific supporting features for academics engaged in sustainability initiatives.

Initially, the anticipated time-frame for the collection of data was two years, beginning in April 2005 and concluding in March 2007. However, the final time-frame was April 2005 – December 2006, due to reaching saturation of the data and categories, noting no new evidence collected, or categories generated after interviewing six of the ten New Zealand academics.

Theoretical saturation is a term that is problematic, as it may be misinterpreted to mean conceptual data sources ‘have been systematically exhausted’ (Dey, 1999:117). Instead, it should be recognised as reflecting an informed judgement about when a concept is *sufficiently* saturated and new information is not adding any further value to the concept.

4.5.3 Coding procedure

I used the general grounded theory coding and constant comparison procedure as outlined by Glaser (1992), and described in section 4.6. As data was sorted, coded and sometimes copied into more than one category, reflecting the sub-themes and emerging radial connections, a series of coded memos, notes and diagrams were made to keep track of emerging hierarchies and connections. Once all the data had been coded, I considered the emergent themes in relation to individual academic ‘cases’ to reflect on whether the themes were congruent with individual interviewee experience. While undertaking this ‘reality check’, I discovered that many connections between themes reflected a range of influences and relationships that academics had with their university leadership.

4.5.4 Documentary evidence

Documentary evidence was collected in an iterative process, in response to questions and or suggestions arising from the interview process, or responding to gaps identified during analysis. Information detailing sustainability learning programme outputs and outcomes was gathered directly from academic and internal university publications, university and government websites and research participants, during and following the period of interview research. It was used to corroborate the programme

descriptions given by interviewees and check data participants had referred to (for example, university policies, student learning outcomes and graduate attributes).

This data provided a background of facts that were used in a triangulation process to better validate, understand and collaborate the qualitative data generated from the interviews. Triangulation is ideal in research (Patton, 2002), as it strengthens a study by combining a mix of sampling strategies, to study a single research ‘problem’ (Denzin 2000). Miles and Huberman (1994) discuss the ongoing academic debate between researchers favouring either the quantitative or qualitative approaches to research, and argue that is the linking of the two that can produce credible understanding of real-world contexts.

Glaser (2001:145) reminds researchers that:

‘All is data’ is a well known Glaser dictum. What does it mean? It means exactly what is going on in the research scene is the data, whatever the source, whether interview, observations, documents, in whatever combination. It is not only what is being told, how it is being told and the conditions of its being told, but also all the data surrounding what is being told. It means what is going on must be figured out exactly what it is to be used for, that is conceptualization, not for accurate description. Data is always as good as far as it goes, and there is always more data to keep correcting the categories with more relevant properties.”

I accordingly kept referring back to earlier data, re-visiting ideas as expressed in memos and re-reading transcripts of participant interviews.

4.6 Data analysis

In grounded theory, comparative analysis of qualitative data is key to discovering the patterns leading to conceptual categories that enable a researcher to develop a theory (Glaser and Strauss, 1967). According to Miles and Huberman (1994) coding *is* analysis and there are many different ways of coding, some more useful than others. The methods I chose for analysing my information-rich data followed the general coding and constant comparison techniques as described by Glaser (2005), based on the earlier inductive coding process as explained in Strauss and Corbin (1990). I chose to use a mix of coding methods, as described below, drawing from both Glaser, and Strauss and Corbin’s methods, seeking to explore the data as intensively as possible.

4.6.1 Coding

The method of ‘coding’, defined by Strauss and Corbin (1990:57) as “the operation by which data is broken down, conceptualised and put back together in new ways” is used by researchers when they wish to construct theories based on a range of variables that have some base similarities and use slightly different processes that lead to outcomes that are essentially common, within a chosen framework. Strauss and Corbin summarise four key outcomes for using coding procedures: to build theory rather than just to test it, to provide science rigour in developing theory, to help the researcher break through the biases and assumptions that accompany research and to provide the grounding, density, sensitivity and integration required to explain a substantive theory that closely represents reality.

Miles and Huberman (1994:62) maintain codes should have conceptual and structural order and “relate to one another in coherent, study-important ways; they should be part of a governing structure”. I used three complementary coding approaches, open, axial and selective coding, following the general method outlined in Strauss and Corbin (1990) with reference to Glaser’s (1992) emphasis on the emergence of a core category. Glaser emphasises that “the goal is generation of theory around a core category” (ibid.:75).

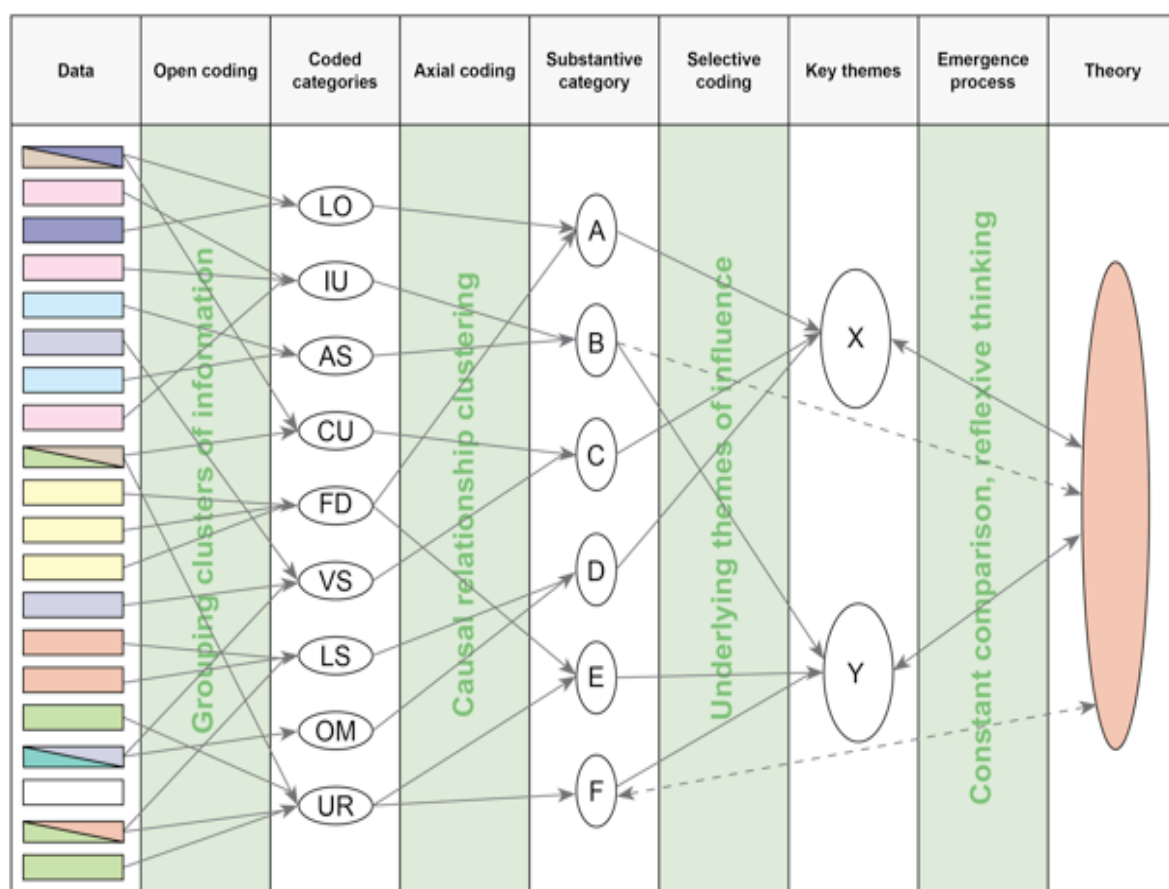
The analytic process moves from concrete codes to more abstract themes, including combined categories representing participants’ understanding of the types of support that enabled the implementation of new sustainability teaching and learning initiatives. Categories representing the underlying challenges affecting those transitions were also analysed, seeking underlying themes and the linkages between those themes and support themes.

Open coding is concerned with the identification, categorising and describing of the phenomena that become apparent within the transcribed interviews, both the concrete and abstract categories (as the latter will help to generate general theory). Axial coding is used to relate the open codes to each other, explore the connections and begin the process of fitting the relationships into a basic framework of understanding, leading to constructing theory.

Selective coding describes the next phase of coding, after core variables are found. In this research axial coding revealed core theoretical codes which were then selected for further exploration. According to Glaser and Strauss (1967:36) a conceptual category must demonstrate it can stand alone, if it is to be useful. In effect, constant comparison of the theoretical codes to the original data, leads more smoothly to the emergence of theory, compared to the more forceful process suggested by Strauss, according to Glaser (1992).

The relationship between open, axial and selective coding is presented diagrammatically in Figure 1, using a sample of codes to demonstrate the process. At all times during the coding process, constant comparison and reflective analysis helped ensure categories, themes and emerging theory reflected the authenticity of the original data.

Figure 1 Coding sequence, from original data to emergent theory



4.6.2 Open coding

Encoding began after checking the transcriptions against the original recorded interviews from research phase one (April and May 2005). Before creating codes I read and re-read the transcribed interviews and my additional observations, taking notes of key similarities. I assigned codes (e.g. NT for networking, RL for research linkages) to clusters of comparable information collated from interviewee responses. These were arranged in an informal matrix of categories, as listed in Table 2, page 118.

New categories were added as more data emerged and a running record was kept of the developing sequence of categories. I describe the validation processes used for checking the reliability of my coded categories in section 4.4.5. Following research in Australia in September 2006, further open coding was continued, with slight modifications to some categories then being made, followed by initial attempts at informal axial coding (section 4.6.4), and later selective coding, as described in section 4.6.6.

Coding methods initially followed a linear process, but quickly became part of an iterative process of coding, reflection, memo-ing and writing notes. As data continued to be assigned to the substantive codes (categories) a level of saturation was reached, with no ‘new’ comments, insights or inferences being added from the data. Charmaz (2006:528), with reference to other researchers, claims that invoking saturation with very small samples leads to the situation in which “such justifications diminish the credibility of grounded theory”. In this study, the total research sample of thirty case-studies is robust enough to accept saturation without compromising credibility.

During this ongoing comparative analysis, a number of ‘memos’ or extended notes (section 4.6.4) were made alongside the basic data, to assist my developing understanding of possible links between underlying themes, and how these related to emerging theoretical implications. Before describing ‘memo-ing’ I discuss the process used for validating the code categories.

4.6.3 Validation of coding categories

Kvale (2002) discusses three approaches to validity – investigation, communication and action, in the context of post-modernity. According to Kvale, checking the validity of research may lead to “paradoxes of legitimisation mania and validity erosion” (2002:323), where excessive focus on checking the validity of findings may actually erode the integral validity of the data. Despite this possible conundrum, Kvale suggests that seeking to establish general credibility for research methods and analysis also provides the researcher with confirmation of their approach to the research. The methods I used to validate my research are discussed in section 4.7. However, open coding validation is an important feature of using grounded theory coding methods and is described below.

Table 1 Categories and Codes

Categories (n = 27)	Codes
Course Structure	CS
Course Structure Development	CSD
Research Links	RL
Learning Outcomes (students)	LO
Operational management	OM
Leadership	LS
Vision	VS
Structural (university) issues	SU
University requirements	UR
Policy	URP
Research	URR
Teaching	URT
University supporting structures	UNS
Committees,	UNC
Institutes and	UNI
Forums	UNF
Cultural (university) issues	CU
External influences	EXT
Networks	NT
Student groups	SG
Interdisciplinary understanding	IU
Awareness of Sustainability issues	AS
Education-for-sustainability - understanding	EFSU
Strategies for awareness raising	STAW
Strategies for ongoing support	STS
Funding issues	FD
Systems Thinking (for sustainability)	SYST
Other	OT

Validation of the open coding categories was undertaken in June 2006. This checking procedure involved two individual interviews being categorised separately by myself and Professor Helen Ross, a visiting Australian university researcher, who has extensive experience working with grounded theory. Following the comparison of our allocations, we found that we agreed on all but three of the general categories. Further discussion about those differences led to agreeing that some statements could be coded into two categories and therefore we added another category into which those statements could be placed. Additionally, because one category – course structure (CS) – covered such a range of detailed material, after discussing the possibility of information about course development processes being masked, we decided to separate CS into two sub-categories. The extra category created was called ‘processes for developing courses’ (PDC).

Further validation of my findings occurred through cyclical questioning, reflection and theorizing about the phenomena being investigated, in effect employing a pragmatic concept of validity that is coherent with using grounded theory as a post-modern social construction of reality (Kvale, 1995). In this and the following phases of my research, informal interviews with ‘other’ academics, focusing on their experience with university leadership, led to further confirmation and validation of my emergent key themes. It is the conceptualisation of the data and emergent themes that lead to theory, not simply analysis of the original base-line data as gathered.

In section 4.7 I discuss, with reference to the literature, further aspects of research validation as it applies to this study.

4.6.4 Memo-ing

Glaser’s (1978:83-84) classic definition of mem-oing is:

the theorising write-up of ideas about codes and their relationships as they strike the analyst while coding ...it can be a sentence, a paragraph or a few pages ...it exhausts the analyst’s momentary ideation based on data with perhaps a little conceptualisation.

Memo-ing is considered to be an integral and important process to use in grounded theory practice (Miles and Huberman, 1994; Strauss and Corbin, 1990) and continued in parallel with my data collection, note-taking and coding. These memos

were effectively notes to myself about some aspect of the apparent causal relationships between categories or ideas relating to an hypothesis I was generating about presumed, inferred or stated relationships between coded categories. I chose to write memos on index cards, using small cards for short memos and larger cards for ‘theoretical memos’. Using cards in this way made it easy to move categories and emergent ideas around as I explored provisional relationships and probable hypotheses for these relationships, or lack of them.

An example of a memo I wrote, in response to data similarities and differences in the category Learning Outcomes for students (LO), is:

Do learning outcomes for papers reflect generic graduate attributes?

Who develops the learning outcomes, the individual teacher, the ‘school’ or the faculty?

How do the learning outcomes relate to the university vision, strategy and policies for student learning (if there are any)?

Find education literature on graduate attributes/learning outcomes.

(from researcher’s notes)

An example of a theoretical memo I wrote, in relation to Operational Management (OM) and leading to linking OM with LO, is:

If there are no university operational management practices demonstrating sustainability processes, then in theory there is likely to be either (or both) a disconnect from or diminishing of understanding of sustainability as presented in the lecture theatre – because there is limited experiential (as in visual, sensory and actioned) reinforcement of that learning in the student’s (and staff’s) immediate environment. Learning objectives should therefore include some aspect of ‘experiencing’ practice for sustainability, preferably at the university, to progress greater understanding of the connectedness of operational practices to each other and how these contribute to the broader goal of moving society towards a more sustainable paradigm.

(from researcher’s notes)

Memos helped refine my thinking, by asking questions about apparent linkages or emerging differences, for example between the two sub-sets of my interview population: academics from international and Aotearoa New Zealand universities.

4.6.5 Axial coding

Axial coding refers to the process of relating codes to each other, using causal relationships to fit the coded categories into a framework of generic relationships. This can assist the researcher to identify the conditions and actions that affect the outcomes being investigated.

In order to relate the category codes (Table 1, page 114) to each other, I arranged the codes in a matrix, as shown in Table 2 (page 118). Only three of the 27 categories are presented, simply to demonstrate the process I used. Using highlighters and annotations I established links and relationships that led to theoretical clusters of ideas (rows 2-4) derived from comparing data, memo-ing and reflective thinking.

To illustrate the process I used, I refer to the first column in Table 2, under the category Learning Outcomes (LO). Learning outcomes are impacted by University Requirements (UR) many of which can be sub-categorised into Policy (URP), Teaching (URT) and Research (URR) as well as by Operational Management Practices (OM), as discussed in Chapter Seven. Learning Outcomes lie within the context of Education-for-Sustainability Understanding (EFSU), in relation to URP (particularly policy related to graduate attributes), URT and Interdisciplinary understanding (IU) within a university. Intervening conditions are External Influences (EXT) and Leadership (LS) influences on URP.

Grouping categories in this way (in a series of cells in the matrix) revealed a number of underlying connections and conditions, leading to emergent themes. These themes provide the ‘frame’ for selective coding, as described in section 4.6.6.

Table 2 Example of Axial Coding Matrix (adapted from Glaser, 1992:61)

Category:	LO	IU	AS
Impacting conditions	UR URT URP URR OM	LS VS AS URP URR	LS VS EFSU URP STAW
Context	EFSU IU UR URP URT	UNS URR URP SYST	URT URP IU SYST
Intervening conditions	EXT LS URP	LS FD	EXT LS OM

4.6.6 Selective coding

Each substantive category was then re-coded, separating out data considered to have either a direct or indirect relationship to the emergent key theme (related to leadership) from data that did not relate so closely. For example, the data in the category ‘Interdisciplinary Understanding’ (IU) was re-coded into:

- a) IUI - Institutional – how institutional processes support or frustrate IU,
- b) IUA - Academic – how academics support this in their teaching, and
- c) IUPG - PG research – how it is expressed in post-graduate research.

In effect I was selectively coding (Glaser, 1992) before analysing the coded data using the perspective lens of the central theme. This resulted in more data contributing to generating theoretical understanding of the role of this central theme when seeking answers to the research questions. For example, when related to research question 11: ‘In your view, what are the ongoing challenges or barriers, in your institution, to developing more programmes that incorporate learning for sustainability?’ the IUI and IUPG processes described mainly frustrated strategies aimed at increasing interdisciplinary understanding, related to lack of support from other academics in leadership roles.

4.6.7 Conditional matrix

Following the identification of categories and their sub-categories and the use of the category-code matrix, (Table 2), a temporary conditional matrix was created, (Figure 2, page 121) following the procedure outlined by Strauss & Corbin (1990). I use selected substantive categories (4.6.6) and the emergent features and themes as components in the matrix. The aim is to assist the development of theoretical codes that provide conceptual connections leading to generating “the necessary theory of underlying problems and processes that will account for action” (Glaser, 1992:29). At the same time, by using a constant comparison procedure of reading and considering the interview data, while seeking fundamental relationships between categories, an underlying central theme may emerge, leading to generating theory.

Strauss and Corbin (1990:158) define the conditional matrix as “An analytic aid..... that enables the analyst to both distinguish and link levels of conditions and consequences”. In this research, conditional matrices are used to identify as clearly as possible:

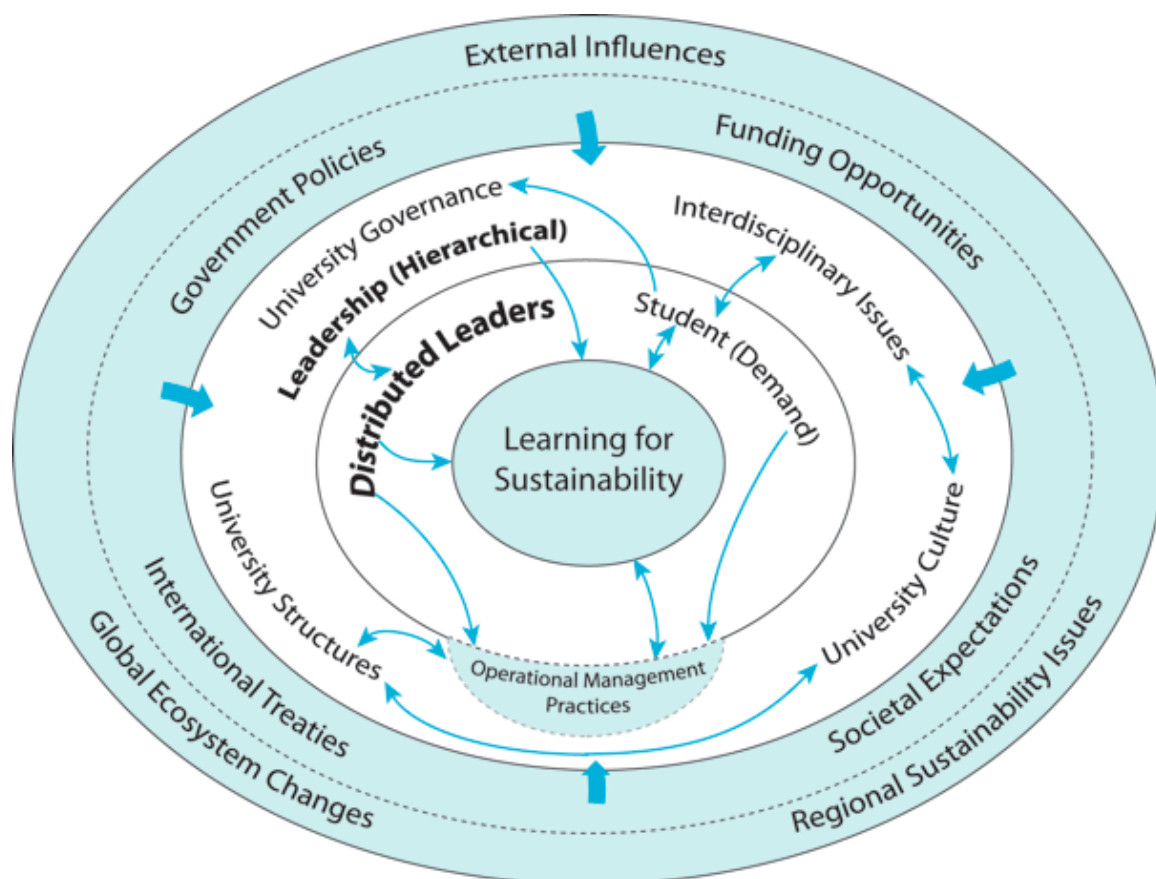
- a) the linkages and interactions that contribute to the successful processes of education-for-sustainability in international universities, and reveal
- b) the lack of expected linkages and processes, thereby hindering desired and current transitions to change, in Aotearoa New Zealand.

As analysis proceeded, the provisional conditional features were adjusted, moved, or deleted, in response to their congruence with the data being considered in relation to the emerging theory. Using Strauss and Corbin’s technique, and with slight changes in terminology, impacting (instead of causal), contextual or intervening conditions were identified and connections between these conditions were explored, leading to key research findings. As well as using the axial coding matrix (Table 2), I chose to use a ‘nested’ matrix echoing the ‘strong’ sustainability diagram reflecting the dependence of our society and economy on ecological systems.

In the nested conditional matrix (Figure 2) I use arrows to demonstrate active connections and dotted lines to show more permeable boundaries across which gradual influencing may lead to impacts affecting the implementation of education-

for-sustainability initiatives. When the conditions revealed through axial coding and the connections revealed in the conditional matrix were viewed through the lens of the key research finding, my theory soon emerged (section 4.6.9), as smoothly as predicted by proponents of grounded theory methodology (Charmaz, 2006; Glaser, 1992, 1995, 1998, 2001).

Figure 2 Conditional Matrix (adapted from Strauss and Corbin (1990))



4.6.8 Emergence of key themed data

Combining the categories (using their codes) in both tables and the nested matrix helped me to explore visually the many and varied connections between features of the qualitative data, and relate those relationships to the emerging themes of leadership. Glaser and Strauss (1967) advocate combining coding with appropriate levels of comparative analysis as way of locating themes and then, through iterative questioning, building grounded theory.

Continual comparison of the data, with respect to connections, strategies and processes lead to the emergence of the key themes that underpinned the development and generation of a theoretical framework for leadership for sustainability.

4.6.9 *Emergence of theory*

Glaser (1978) argues that a certain level of theoretical sensitivity is needed, in order to create and integrate conceptual hypotheses. There is a need to establish connections, by seeing the possibilities and asking questions about the processes and actions that appear to lead to those conditions. Once key themes have emerged through the grounded theory analysis process, then theory may also emerge. Charmaz (2006:135) suggests this is because, “When you theorize, you reach down to fundamentals, up to abstractions, and probe into experience.”

In this study, all but two of the themes that emerged were applicable to all participants, in both the international and Aotearoa New Zealand subsets. The two key differences between the sub-sets were revealed to be the presence or absence of effective hierarchical university leadership for sustainability, and the connections or lack of connections between academics involved in sustainability learning initiatives. In Chapter Six I explore the complex connections, leadership relationships and reflexive thinking that leads to my emergent theory: an active dendritic framework for enabling university leadership connection and collaboration for progressing education-for-sustainability.

4.7 Validation of research

4.7.1 *Evaluation criteria*

Miles and Huberman (1994:262-276) provide an extensive list of thirteen tactics for assessing data quality, testing explanations and confirming hypotheses. This list includes triangulation, checking for researcher understanding and researcher effects, looking for negative evidence and getting feedback from informants. In December 2007 an abstract and brief overview of my findings were forwarded to research participants, seeking their feedback. Positive responses further validate my research findings.

According to Charmaz (2006) there are four general criteria that need to be addressed when evaluating the empirical study and the development of a theory; *credibility, originality, resonance and usefulness*. This research study has met all these criteria.

4.7.2 Validation from findings and discussion

Credibility is achieved through researcher experience with the education-for-sustainability context being explored, the use of a consistent and constant comparison grounded theory method of analysis, and validation from the literature (section 4.7.3).

Originality is demonstrated in the emergence of theory, from information rich data about processes for implementing sustainability learning, leading to my argument that university leadership relationships are key to implementing sustainability initiatives. There is limited explicit reference to the importance of the role of university leadership for sustainability in the academic literature.

Feedback from research participants and ‘other’ critical academics suggests my findings and theory have authentic *resonance* for the university situation, and may be useful for providing a framework for enabling sustainability learning initiatives in universities. A high level of resonance is apparent when my proposed theory is aligned with the exploration of possible contributions (Chapter Seven) and current challenges (Chapter Eight) to implementing learning for sustainability in universities.

4.7.3 Validation from literature

As analysis proceeded, through the various interlinked and reflective phases of sorting, categorising, re-categorising and memo-ing, including theoretical memo-ing, and in response to emerging themes I read an expanding range of literature. Researchers argue (Charmaz, 2006; Glaser, 1978, 2001) that reading relevant literature as different themes emerge is part of the grounded theory process even though some themes become subsumed as analysis proceeds. Exploring a range of literature helps inform thinking, particularly when new understandings are being developed, rather than constraining ideas by trying to fit the emerging data into a preferred conceptual theory.

During the research process I kept up to date with the rapidly developing international, national and community debates and collective ‘voice of concern’ regarding current and predicted sustainability issues. Articles discussing the role of leadership for the twenty-first century, in both the academic literature and media publications provided further validation for my emerging theory (Chapter Six).

4.8 Summary

In this chapter I have described the focus of this research, clarified the research problems and explained the reasons for using grounded theory methodology. I have explained my reasons for purposeful sampling of thirty academics involved in teaching for sustainability, provided details of the data collection and outlined the phases of the grounded theory methods used during the analysis process, with reference to current literature.

Descriptions of coding procedures and diagrams have provided enough detail for the reader to follow the analysis process and gain an insight into how findings, themes and subsequently a theory emerged.

I have briefly described the processes I used for evaluation and validation of my research methods, with reference to criteria and tactics for testing for confirming findings. In addition I have noted the relevance of my emergent theory to the ‘situation’ of the university.

In Chapter Five I present the qualitative results that are most relevant to providing answers to my research questions and describe the findings that lead to key emergent themes. These themes shaped the platform from which I generated my theoretical framework for university leadership for sustainability, as explained in Chapter Six.

CHAPTER FIVE

Research Findings

Not everything that can be counted counts, and not everything that counts can be counted.

Albert Einstein (1879-1955)

5.1 Introduction

In this chapter I present an overview of my qualitative research findings, using explanatory narrative and participant statements that describe interviewee experiences or observations related to establishing education-for-sustainability initiatives within their university. I note similarities and differences between results from the two subsets of academic participants: twenty from seventeen international universities and ten from four universities in Aotearoa New Zealand.

I have chosen to organise these results in a way that represents my current research journey, one that started out seeking ways to progress and implement education-for-sustainability in universities. As discussed in previous chapters there is growing societal concern, supported by increasing contributions to the academic literature, that a new focus on sustainability should be an integral part of all learning henceforth. Sustainability learning initiatives have a number of generic features, as described by research participants, outlined in section 5.2 of this chapter and further discussed in Chapter Seven.

Initially I was seeking explanations for the relatively few opportunities in universities, in Aotearoa New Zealand, to engage in substantive learning for sustainability, hoping to find a ‘blueprint’ implementation process being used in international universities for establishing education-for-sustainability initiatives, one that could be easily adapted to use here in Aotearoa New Zealand.

However, through using grounded theory methodology for analysing my qualitative data I embarked on a new and interesting phase of my research, as underlying themes were

revealed, behind the varied strategic processes for implementing education-for-sustainability, as described by participants. Further analysis resulted in exploring how current fragmented sustainability initiatives may be effectively connected to build capacity for coherent university-wide sustainability learning. This, coupled with the research findings led to developing my theoretical model of an active dendritic framework for university leadership for sustainability, as described in Chapter Six.

Therefore, in this chapter I emphasise the results most pertinent to the development of the model and then, in the tradition of grounded theory enabling further interpretation of results, in Chapter Seven I present and discuss more results. These include connection and collaboration strategies, within a dendritic framework, that are likely to assist education-for-sustainability initiatives.

To preserve the anonymity of the interviewees the formulaic numbering of responses is used, numbering international academics (I) from 1–20, e.g. [I-15] and New Zealand participants (NZ) from 1–10, e.g. [NZ-4] to help the reader gain some indication of both differences and similarities in the responses of the two participant sub groups. Participant quotes are presented as recorded, with only minor editing of redundant words. In a few instances words are inserted in square parentheses in order to tie the statement to the previous question or comment. I acknowledge that individual participant comments are being removed from their context, and note that my interpretations of these comments are made with reference to the specific ‘case’ of each interviewee, supported by additional data, observations and clarification questions.

Participant answers to the twelve research questions (Appendix 9) provided a wealth of qualitative data. Using grounded theory methodology for analysing this information enabled me to reach down into the data to uncover and explore similarities, connections and relationships between a variety of processes individual academics used to develop and implement learning for sustainability initiatives.

After re-examining and re-grouping statements, in the context of individual and other participant contributions, and in response to underlying similarities across a range of

descriptions, embedded themes emerged. Analysis of the participant responses revealed generic themes that led to the development of my theory (Chapter Six).

These themes provide the framework for organising my results, as listed:

- Learning for sustainability initiatives – components
- Challenges to university changes for sustainability
- Strategies for gaining support for education-for-sustainability
- Embedding support for an education-for-sustainability journey
- The key role of hierarchical leadership support

I provide a brief narrative overview within each general theme and present the supporting, representative participant responses that contribute to my findings. In Chapters Six and Seven these themes are further discussed, and substantiated using additional participant statements that provide explanations and insights into the connectedness of themes, with references to the literature and documentation data (where appropriate).

Analysis of my results, by grouping similarities and comparing the individual interview responses, while relating those to each participant's context, reveals commonalities between individual academics' knowledge of and experience with the processes of developing sustainability learning programmes.

I also compare responses from the two subsets of academics implementing learning for sustainability initiatives, in either international or Aotearoa New Zealand universities, revealing two key contextual reasons for the education-for-sustainability differences between the groups. These two differences show that the presence or absence of the following features:

- the level of hierarchical university leadership support for sustainability initiatives, and
- the level of national and university policy support for sustainability

contribute significantly to the successful establishment and implementation of substantive sustainability learning programmes.

When these features are absent, I found no substantive evidence of capacity building leading to university learning for sustainability, beyond individual academic's initiatives, limited to a few papers being taught within courses. My findings reveal that widening academic involvement in the implementation of new learning for sustainability initiatives depends on the level of support from hierarchical university leadership. This support may depend on the level of national and university policy support for sustainability (as discussed in following chapters).

Unfortunately, it is beyond the parameters of this thesis to present all my research results, and I look forward to taking future opportunities for analysing some data categories in more detail, for example the influence of research strategies for sustainability outcomes.

In this thesis I focus on those results most relevant to answering my initial research questions (as discussed in Chapters Two and Three), leading to a key research finding from the extensive qualitative data, that supportive, hierarchical modes of leadership are key to implementing substantive learning and teaching for university sustainability initiatives.

This key finding and the emerging connected themes lead me to theorise how the interface between current isolated initiatives and hierarchical support could be activated and developed, especially by academic leaders in universities in Aotearoa New Zealand.

5.2 Learning for Sustainability initiatives – components

There is evidence in the academic and popular literature, and on websites, of an increasing number of universities offering sustainability education programmes. Where the titles of degree programmes include the terminologies of sustainability, sustainable development or sustainable futures and even sustainable management, an assumption can be made that these are holistic interdisciplinary programmes, at the same time acknowledging that not all authentic learning for sustainability programmes, nor courses or papers, necessarily have 'sustainability' in their title.

Descriptors of degrees and descriptions of course contents and individual papers provide more detail of content, teaching and learning processes, for example whether collaborative projects are undertaken, or whether critical thinking is a focus, or working experience in the community is part of the programme. However, only presumptions about the quality of these programmes can be made, unless some evaluations from students and employers are available.

In this thesis I use the word ‘programme’ as a noun to include a number of ‘courses’, made up from a number of varied lectures, papers, tutorials, workshops and research requirements that are offered as a planned coherent ‘programme’, for example; Masters for Sustainability, Masters of Environmental Education-for-Sustainability and Bachelor of Sustainability Science.

The first formal question that interviewees were asked was:

- What specific programme(s) for learning for sustainability are you involved in?

The reason for this question was to establish whether the interviewee was engaged in sustainability teaching that involved more than single disciplinary knowledge and included the attributes that contribute to deeper learning and understanding of the complexity of many sustainability issues. The programmes described by research participants had titles ranging from those that explicitly stated sustainability, to those that retained more traditional or historical disciplinary titles, despite their development into inter-disciplinary learning programmes, for example the title Bachelor of Environmental Studies.

All participants described components of the programmes (or papers and courses, in the case of academics in Aotearoa New Zealand) that they were involved in and either provided additional hard copy material, references to their academic papers or website links. I used this additional data for further exploration and validation of international programme descriptions, and courses and papers focusing on sustainability in universities in Aotearoa New Zealand.

It is not the intent of this research to assess the quality of individual sustainability programmes and the sustainability learning outcomes for staff and students.

However, the responses to two interview questions did reflect participants' opinions of the positive value of sustainability learning programmes in general.

Question Four asked:

- What academic learning outcomes are intended for students participating in this programme?

The responses varied, in relation to individual academic knowledge of what those learning outcomes were, or whether there were any. International programmes had specific sustainability learning outcomes, as described by the representative statements below;

Learning outcomes are intended at undergrad level to lead to, by the third year, an understanding of sustainability. [I-4]

We have a focus on the students developing an understanding of environmental education-for-sustainability and developing the ability to design, implement and evaluate an environmental programme or project. They get that process of experiential learning and actually doing a project ... we have to try and give them the skills and tools that they will need and an understanding of the process. [I-1]

They [learning outcomes] vary a little bit from one another, in each of those programmes. I suppose it's broadly grounding in sustainability thinking, provision of practical skills, understanding of key debates about issues. [I-7]

It's [sustainability] implicit but not explicitly outlined in the learning objectives. [I-8]

Participants involved in sustainability initiatives lacking specific learning outcomes for the programme or course made comments similar to this international response:

We ought to have a set of common objectives and themes across the university at undergraduate level that are stitched into the interdisciplinary thinking of each of the faculties (involved in sustainability initiatives). There is no administrative drive to achieve that goal. [I-5]

This participant came from an international university with (at that time) low levels of administrative support for operational sustainability, despite growing support from individual faculty deans. A response from a participant from a university in Aotearoa New Zealand reflects the same concern:

We have a set of graduate outcomes, so apart from things like literacy and communication skills I think the student should have an understanding of

what is sustainability and how you evaluate whether you're moving towards it. [NZ-1]

Generic features of sustainability learning (as discussed in Chapter Seven) are described below, in interviewee responses to interview Question Five, namely:

- What feedback have you had about this programme, from students, colleagues and employers?

The comments from international academics reflect the inclusion of a range of sustainability learning pedagogies, including critical thinking, inter-disciplinarity and experiential application of knowledge.

They [employers] say about the students – they find that they are really good critical thinkers, which we really stress. [I-17]

We have a focus on trans-disciplinarity, and that's certainly something that students are demanding for preparing to changing careers five times in a lifetime and being able to consider career options more broadly. [I 15]

Academics from universities in Aotearoa New Zealand made more general comments, similar to these statements below:

Students say that they are applying their [sustainability] knowledge in their field beyond the university. [NZ-4]

Feedback is overwhelmingly positive from employers. [NZ-5]

A range of similar and identical attributes for sustainability learning programmes are mentioned by participants, from both subsets of academic interview responses - international and Aotearoa New Zealand universities. References to these attributes were both explicit (as noted above) and implicit within some very extensive descriptions of sustainability programmes, and included:

- Learning within the broad context of a sustainability paradigm,
- Learning critical and reflexive thinking skills,
- Opportunities for engagement with real-world issues, focusing on solutions,
- Inter-disciplinarity, using knowledge from a range of disciplines, to enable systems thinking learning, and
- Experiential opportunities through collaborative group or individual work with their external community.

These attributes correspond to suggestions in the literature (Moore, 2005; Sterling, 2001; Tilbury, 2004) that a range of key components should be included within a sustainability-learning programme, including those listed above.

A closer examination of the participants' programme descriptions in conjunction with their proposed learning outcomes for students, shows that a programme with a focus on learning for sustainability includes developing the knowledge and skills necessary for contributing to societal actions leading to sustainability. All international programmes have opportunities for student involvement in researching real issues, either on campus or in the wider, even global community.

International undergraduate sustainability programmes were based mostly in science faculties, particularly in Environmental Science or Environmental Studies, or similar schools within Science faculties, and 80% had core papers that all students had to complete. Undergraduate sustainability programmes in education faculties had specific environmental education-for-sustainability papers as components of the programme. One programme had a core 'graduate attributes' course that included 'understanding sustainability' and three had elective sustainability papers. According to interviewees, most students in the general programme choose to take those electives with a sustainability component.

International Masters programmes covered such a wide range of disciplines, including such varied combinations of core and elective papers, research credit requirements, and contributed to such diverse degrees, within different faculties, that despite efforts to analyse and group them, that diversity could not be 'categorised'. This wide range of examples demonstrates there are numerous opportunities for developing comprehensive sustainability learning programmes within and across all faculties, reflecting the complexity of sustainability and the fact that all knowledge sectors can make an educational contribution to learning for a sustainable future.

In Chapter Seven (section 7.2) the essential components of learning for sustainability programmes are discussed, with reference to teaching and learning pedagogies, eco-literacy and the role of disciplinary knowledge and student expectations.

The situation in Aotearoa New Zealand is very different. While scoping this research during 2003, I failed to find a university programme that offered substantive learning for sustainability as its main focus. I did note that Environmental Studies programmes have individual papers, short courses and components of programmes, that include contributions from other disciplines. However, I found no descriptions that clearly articulated that *all* components of learning for sustainability were covered. Engineering, Architecture and Planning degrees are examples of programmes that usually include some papers with a substantive sustainability focus, probably a reflection of their responsibilities and connections to their professional bodies, and the role of external agencies in supporting moves towards learning for sustainability.

Recent desk top audits of tertiary education-for-sustainability in Aotearoa New Zealand, carried out in 2004 (Chapman and Flaws et al., 2006) and late 2006 (Stone and Baldoni, 2006), are discussed in Chapter Two. The findings from these audits reinforce my contention that there is a pressing need for more learning for sustainability in Aotearoa New Zealand. In 2006 I learned of a new collaborative Masters programme between Lincoln University and the University of Natural Resources and Applied Life Sciences (BOKU) in Austria. This programme has global sustainable development as its major focus (Buchan et al., 2007).

More recently, in 2007, I learned of plans for a core undergraduate course in sustainable architecture at Victoria University of Wellington. These, and I hope similar other initiatives that have not yet come to my attention, are leading the way in our Aotearoa New Zealand universities.

5.3 Challenges to university changes for sustainability

According to all participants in this research there are many barriers to the changes required for enabling effective teaching and learning for sustainability in all universities. Challenges include institutional structures and management systems; academic cultural norms and career expectations; current teaching pedagogies and opportunities for professional development; disciplinary based funding processes, external policies and hierarchical leadership support.

This section provides an overview of some of these challenges, as described by participants in response to questions eight and eleven in the formal interview;

8. In your view, what were the main challenges or barriers to establishing this programme – a) within your university and b) from outside the university?
11. In your view, what are the ongoing challenges or barriers, in your institution, to developing more programmes that incorporate learning for sustainability or sustainable development?

Those university challenges to establishing programmes that integrate learning for sustainability, as voiced by international participants, were compared to those voiced by New Zealand participants. Both were then broadly compared to the generic challenges described in recent academic literature to see if key differences between the participant groups were reflected in the literature (Table 3, page 135).

Participants from international universities established since the 1970's, where initial environmental programmes, (leading to wider sustainability programmes), had been developed using an interdisciplinary or holistic learning framework reported fewer institutional barriers. Despite this, those participants reported that some cultural challenges still exist in those universities, particularly with academics in those faculties not involved in sustainability initiatives. Within a specific university there are many different academic 'cultures' and communities of practice, even if there are coherent faculty processes, institutional policies and a university governance focus on sustainability.

A range of the representative comments made in response to the question about challenges and barriers to implementing sustainability initiatives are presented in this section and discussed in more detail in Chapter Seven, with reference to the challenges reported in the literature (Velazquez et al., 2005) (see Table 4, page 141). I have grouped reported challenges into themes, while acknowledging there are a variety of both generic and unique issues, dependent on the context and culture of the university in which individual participants are teaching. These main themes are as follows:

- Institutional support for sustainability
- Management structures
- Academic culture of the university,
- Inter-disciplinary programmes, especially sustainability ones,
- Funding allocations, and
- Leadership within the university

Table 3 Comparison of key factors influencing EFS initiatives in universities, as reported by research participants and in recent academic literature

KEY FACTORS	International participants report:	<i>Aotearoa New Zealand participants report:</i>	Identified Academic Literature in
Institutional support	Good support	<i>Absent or minimal support</i>	Variable support – depends on nation/state
Management systems	Some support	<i>Little support</i>	Limited support
Academic culture	Increasingly supportive	<i>Very limited support</i>	Limited support
Interdisciplinary factors (research & teaching)	Interdisciplinary opportunities increasing	<i>Limited interdisciplinary opportunities</i>	Increasing interdisciplinary opportunities
Funding	Available for inter-disciplinary research	<i>Limited or lacking</i>	Variable and increasingly available
External policies	Supportive	<i>Lacking</i>	Supportive
Hierarchical Leadership support	Present	<i>Lacking</i>	Limited

5.3.1 Level of institutional support for sustainability

Analysis of participant responses showed that individual academics face major challenges to developing sustainability programmes when there is no authentic university institutional support for a sustainability paradigm. In relation to the role of the institution, a New Zealand participant states, very directly:

There is no appreciation of [sustainability] issues, no investing in the future, no strategic development for the future. [NZ-4]

An international academic points out that difficulties remain with the wider institution, even where sustainability programmes are well embedded in a faculty:

I think a lot of people care at an individual level, but institutionally it becomes a question of how do you take that on, and they've got problems ... so they ignore it [sustainability issues]. [I-16]

Participants from universities with limited or no institutional commitment to sustainability express concern about difficulties faced in building coherence and collaboration from uncoordinated sustainability initiatives, for example:

We struggled with competition amongst sustainability groups, oh yeah. I think that's the worst problem, there's so little funding so here's all these tiny little sustainability groups and you know you start to get animosity between them because you're like we're applying for that. [I-14]

Where there are different people in different disciplines teaching sustainability there is ownership of the concepts and rivalry rather than collaboration. Jealousy due to turf-protection and if considering inter-disciplinary, this is seen as cutting across power bases [NZ-3]

Participants refer to a low level of institutional support for a sustainability framework, as reflected publicly by the lack of appropriate links on the websites for the sustainability focus and initiatives that were in progress in their departments. Even in universities where a sustainability programme exists, a range of communication problems are apparent, as explained below:

I told a secondary student that we had a strong sustainability component in our degree, but they went to our competing university because there was a website link there to programmes with a sustainability focus, at that university, not at ours. Yet we have much more grounded and experiential programmes [for teaching sustainability issues/skills]. [I-9]

I think the university could do a much better job in marketing itself and marketing its programme in this area [sustainability]. [I-8]

If I'm a student right now, in this place, I can't go and find [sustainability] courses because no one's figured out how to coordinate them. [I-14]

These statements reflect the emerging theme of low levels of university interest in supporting institutional change for sustainability.

5.3.2 Management structures

Participants comment that changing management structures, tending towards more business and corporate models, create further barriers to implementing education-for-sustainability initiatives. This is expressed in a variety of ways:

I think it is just big and unwieldy and I think that has a lot to do with it [I-16]

It's all very much invested in the minority now, the management. You have an academic board at senior level and an academic administration committee of a few people and they make all the decisions. So a kind of un-democratisation, compared to that time (1970s) when it was more democratic. [I-11]

Management have no idea and no interest in sustainability and in what could be future-looking courses. [NZ-4]

This different perspective on why management was a barrier to change was offered from an international participant who had worked outside the university for 15 years:

When I came back into the university it was like going back to my post PhD days in terms of how the place was run - what has changed in the outside world has not been reflected in here. [I-8]

These findings are explored further in Chapter Seven, section 7.3, when discussing institutional arrangements, including financial and corporate operational practices.

5.3.3 Academic cultural challenges

There are many academic cultural challenges, some expressed as simple statements and others explained in relation to more complex situations. A few examples of participant statements follow:

I think the academic personality is a big barrier. [I-16]

Even within the same department they hardly talk to each other ... [I-13]

They're saying well we want to defend the traditional qualities, the traditional subjects against these encroachments you know. So there's that kind of attitude. [I-12]

Another participant who was attempting to establish a sustainability course (and was very frustrated at the lack of support from other academics) commented:

I sense a certain amount of opposition from colleagues because it is seen as treading on their particular expertise and academics are a very arrogant lot. [NZ-6]

Academic attitudes have a pervasive influence on student active engagement with operational sustainability initiatives and their learning for sustainability. As a participant noted:

Students are disillusioned by the gap between the reality and the rhetoric [of sustainability] in university. [NZ-1]

Key aspects of academic culture are investigated more fully in Chapter Seven, section 7.3.2, with reference to this research and the literature relating to challenges for leadership for change within the university.

5.3.4 *Interdisciplinary challenges*

All participants noted, in some way, the tensions between traditional university disciplines and the development of interdisciplinary programmes, for example:

Interdisciplinary [programmes]) – this is an issue that the current administration seems to be somewhat more focused on and is seeking ways of trying to erode those faculties that are protecting silos. [I-7]

I think one of the major barriers is, in this particular field, that it is truly interdisciplinary and as a result it's impossible for any one school to wholly own it and the integration across interdisciplinary units every day is a nightmare because everything has to be accounted for down to the dollar in each division and it makes it really difficult. [I-1]

It is a discipline based university and it prides itself in that and it has a pretence clause in its mission that it also interdisciplinary. It doesn't know what it [inter-disciplinarity] is and it has no one in any part of authority who understands what it is. [NZ-5]

Generally speaking in terms of reactions to these interdisciplinary programmes, there still remains those who have a certain amount of opposition because they see them again as general programmes. Well we should be doing both. We need specialists but we also need those people with interdisciplinary understanding. [NZ-6]

In Chapter Seven I discuss how interdisciplinary challenges and academic cultures are closely related, and suggest how they may be managed and turned into opportunities for new learning and research for transformative sustainability initiatives.

5.3.5 Funding challenges

There are funding challenges for both teaching and research for sustainability. Academics from Aotearoa New Zealand discuss the availability of research funding for inter-disciplinary research in entities external to the university, (for example the Crown Research Institutes), compared to the lack of such funding for university research and teaching. One explains that:

I can't think of any funding source that supports research purely on sustainability. [NZ-7]

An international participant, who teaches in a university with supporting sustainability policies reflects common funding allocation problems when commenting:

The rhetoric is that we get together, that we try and share our courses. The main problem is that we're all desperate for the dollars that come when students come to our courses. [I-8]

Funding problems can arise when developing interdisciplinary programmes, for example how to allocate finance to departments, relative to how many lecturers and researchers are engaged in the interdisciplinary programme. The funding of a new sustainability focused Masters Programme looked to be problematic, as outlined by the coordinator for the new initiative:

This was an initiative of the deans not of the deputy. The Board oversaw its initial development and were forthright in defending it and representing it to senior people in the university. There were difficulties about how it was going to be costed. Different faculties have different models and they were not going to be reconciled easily. [I-5]

The institutional, management and disciplinary structures of universities and the general 'academic culture', together with the availability of funding for new initiatives, create a complex system of relationships, leading to considerable challenges for any interdisciplinary teaching and learning.

5.3.6 Other challenges

There are many more challenges, each mentioned by fewer than 40% of the respondents, dependent on their individual circumstances. New Zealand participants voiced strong concern about what I am calling perverse incentives, such as rewarding the number of published peer reviewed research papers, (easier to produce within

narrow disciplinary frameworks), congratulating lecturers for full lecture theatres (related to the fact that ‘bums on seats’ brings more money into the faculty) and the difficulty of gaining university support for and then finding research funding allocated for inter-disciplinary research.

International participants mentioned the impacts of being multi-disciplinary when seeking research grants from funding committees, when those committees had vocal members who continue to favour disciplinary research and the intra-university problems of academic perceptions of colleagues in different disciplines. These and other barriers and challenges are discussed in more detail in Chapter Seven.

Table 4 Comparison of challenges to implementing EFS

Factors: from Velazquez et al. (2005)	Factors: from research participants
Lack of awareness, interest and involvement	Lack of awareness, interest and involvement
Organisational structure	Organisational structure
Lack of funding	Lack of funding
Lack of support from university administrators	Lack of support from university administrators
Lack of time	Lack of time
Lack of training	Lack of training
Resistance to change	Resistance to change
Profits mentality	Profits mentality
Lack of interdisciplinary research	Lack of interdisciplinary research
Lack of policies to promote sustainability on campus	Lack of policies to promote sustainability on campus
Lack of standard definitions of concepts	Lack of standard definitions of concepts
Lack of opportune communication and information	Lack of opportune communication and information
Lack of performance indicators	<i>Reward structures, publication emphasis</i>
Lack of more rigorous regulations	<i>Culture of disciplinary protection</i>
Lack of data access	<i>Little national EFS tertiary education focus</i>
Lack of designated workplace	<i>Academic culture</i>
Technical problems	<i>Student culture</i>
The “Machismo”	<i>Cross-disciplinary funding</i>

Velazquez et al. (2005) list 18 factors, from the highest to the lowest degree of incidence as presented in the information sources they used (but in no particular order of importance), that negatively impact on the development of sustainability initiatives in Higher Education. Participants in my research mentioned twelve of those factors, as well as other factors (in italics), as shown in Table 4. The variety of research responses reflect the very fragmented nature of the many presumed ‘communities of interest’ that together make up the institution of the university.

There is no ‘blueprint’ for the implementation of sustainability initiatives and I suggest this ‘lack’ is effectively a unique space, offering opportunities for universities to design and create both individual and connected learning initiatives and that the role and mode of sustainability leadership (as discussed in Chapter Six) is crucial for building the capacity to make the transitions towards transformative learning for sustainability. As this research reveals, it is passionate individuals or very small groups of future-focused and like-minded individuals who have influenced others to accept and trial new teaching and learning sustainability initiatives, rather than any particular combination of strategies to overcome a range of identified challenges.

This next section describes how academics responded to a variety of university challenges by strategically seeking support from faculty deans and/or higher level leaders to enable their new programme initiatives to succeed.

5.4 Strategies for gaining support for education-for-sustainability

International participant responses to questions nine, ten and twelve of the research interviews (Appendix 9) resulted in descriptions of a wide range of processes for gaining support for developing and then implementing sustainability teaching and learning initiatives, leading to wider university education-for-sustainability programmes. Aotearoa New Zealand academics used some similar strategies or processes, to establish support for their individual efforts, as shown in Table 5, page 153.

The three questions are:

- What processes were worked through to enable the development of this and other programmes with a substantive sustainability focus?
- In your view, what processes were the most successful and in what order did they proceed?
- How do you think some of these challenges could be overcome – what processes do you think could work best?

Those processes and strategies most frequently mentioned, or implied in connection with other descriptions and discussions, are grouped into themes and presented here to show how these general findings contribute to the development of my framework for university leadership for sustainability. Using grounded theory methodology reveals connections and underlying processes that are not always explicitly stated, but emerge after grouping, re-grouping and asking both inductive and deductive questions about the data being analysed.

None of these strategies work in isolation, all are connected and linked to a range of processes, whether they have developed from initial distributed, individual academic teaching initiatives or have been strategically planned by positional hierarchical university leadership. Key strategies that have been used by international and Aotearoa New Zealand university leaders for sustainability in order to gain support for education-for-sustainability initiatives are listed in Table 5, page 154.

5.4.1 Responding to International and National government policies

The increasing global focus on environmental and social sustainability issues is reflected by the continuing advocacy by international agencies, for example: the UNESCO-led United Nations Decade for Education-for-sustainability (UNDESD) and the International Union for Conservation of Nature - Communication and Education Commission (IUCN-CEC) for changing teaching practices to enable learning for sustainability. International agreements seeking to moderate the effects of global warming, global programmes for poverty reduction and national government educational and research funding policies all have some degree of influence on the

willingness of leadership within the university to initiate or support sustainable operational management changes and teaching and learning for sustainability.

There are clear recommendations from global organisations, for example the United Nations University (UNU) and the University Leaders for a Sustainable Future (ULSF) that universities should re-orientate their educational curriculum to include teaching and learning for sustainability, as discussed in Chapter Two.

According to participants, making reference to these leading international recommendations can be useful when engaging academics and university hierarchical leaders in dialogue and discourse about the reasons for exploring education-for-sustainability . An overseas interviewee describes how the learning for sustainability initiative, driven by societal concern and promoted by an international organisation began in her university:

This grew out of Earth Summit 92 and it comprised a network of environment and development education organisations who decided that something needed to be done following Agenda 21, to bring together those education commitments. This grouping developed a proposal for a Masters level course and then took it around a few universities and this university was the most encouraging. [I-3]

This participant also explained how the leadership support for the new Masters sustainability education programme resulted in a continuing increase in post-graduate student numbers for that university. Another participant, when referring to the increase in university support for education-for-sustainability comments, in relation to the UNDES D:

There was no VC support, ... back then when no one else had ever heard of it, there's been more support in the last year and a half since the decade. [I-1]

Interviewees noted that increasing international, national government or local government concern about unsustainable practices has resulted in increasing numbers of environmental or sustainability policies. The fact that these policies existed were deemed supportive factors, when presenting to the curriculum committees (or equivalent groupings) the rationale for developing and implementing education-for-sustainability . One international interviewee explained that following the release of the state government's leading sustainability strategy there had been a

steady increase in the postgraduate sustainability programme. Another participant commented that:

We now have state and environmental policy which is not mandatory but it's nonetheless policy that seems to have people accountable for its implementation, and one of those is that all students will graduate from a university with an Environmental Education unit. Environmental Education being interpreted as in the broadest sense of educative sustainability. [I-3]

This directive environmental policy is in stark contrast to the lack of government policy that leads another interviewee to suggest that such policy is needed, before universities will become involved in learning for sustainability:

We are definitely shaped by the external environment in that respect [sustainability]. So if we can convince governments to even more so stress certain sustainability agendas then it will [enable] us to be able to respond and contribute. [NZ-9]

The increasing societal call for new research and learning for sustainability has led tertiary institutions to become involved in innovative new ways of teaching and learning while focusing on solutions. The United Nations Habitat programme, urban sustainability programmes and climate change issues are mentioned as examples of a range of contexts that can provide an impetus for university leaders, within faculty and departments, to develop programmes using these sustainability issues as a focus, with opportunities for extending teaching and deepening learning for a sustainable future. For example in reference to a new university sustainability programme, interviewees explain:

I think urban sustainability's interesting because they're [national government] going to put a whack of money into the cities in this country and so urban sustainability could be the umbrella under which they do a lot of revitalisation in the cities. [I-16]

I think the recent government policy action plan and the UNDES D has helped move things along. [I-12]

The role of local government leadership in seeking to employ sustainability graduates was recognised by participants commenting on expectations and increasing employment opportunities for knowledgeable graduates:

[local government] in the past has employed all of the students, they like students who can combine the broader thinking with quantitative skills, for example. [NZ-7]

The growing employer expectation that students will have critical thinking skills and broader ‘systems thinking’ understanding, particularly in relation to sustainability issues is discussed in Chapter Seven.

5.4.2 Stakeholder and partnership expectations

The development and maintenance of university relationships with stakeholders for securing research funding and partnership opportunities for shared sustainability research is mentioned by participants. Industry Reference groups or their equivalents, often with links to external research bodies, are seen as important for supporting new research initiatives, whether it be changing from currently unsustainable technologies, investigating alternate resource use or encouraging more sustainable patterns of behaviour.

These groups are leaders in translating societal concerns about the need for learning, research and solutions for current sustainability problems into the academy. The following comments are typical of international participant experiences:

From the 1980s we couldn’t keep up with the demand because more and more companies were saying oh yes, we do need people who understand the ecological, economic and social languages and look across the whole sustainability field. [I-13]

We did a lot of work setting these [sustainability] programmes up in terms of market research, in sense of contacting people in environment in the professional community. We consulted, we put out concept statements on the programmes to interested employers, took their feedback on board and so designed it. I mean there’s no question in their minds that there is a demand for it. [I-7]

Some participants described innovative ways in which they sought external funding, especially where that funding was given for research into a sustainability issue, and how they built a relationship with the external fund provider to undertake further action-research and conjoint learning initiatives. For example, in an international (Canadian) university, the Vice-Presidential leaders’ group chose sustainability as the theme for funding collaborative sustainability research themes. This meant that sustainability educators and researchers could then access regional partnership support funding aimed at collaborative research, for example, urban sustainability.

5.4.3 Student and alumni expectations

In response to varying combinations of external stakeholder expectations, and student interest and demand, a range of co-ordinated initiatives has emerged. One new Masters sustainability programme has a specific university director to lead the necessary coordination:

The Masters students the demand was there for them to be able to take subjects across the university, to be unconstrained in taking those subjects, to have an intelligent dialogue with a director that leads into a profile subject [for sustainability] that's not constrained by arbitrary university boundaries. [I-5]

In international universities with sustainability-focused post-graduate programmes, both student expectations and alumni support are acknowledged as important for developing and maintaining interdisciplinary Masters research programmes.

Participants voiced comments about the importance of education-for-sustainability, similar to the following:

Especially amongst graduates, they have a discipline, they're an economist or they're a lawyer, they're something - and they want to be able to deliver sustainability outcomes and it means different things to different people in different contexts. The programme has to be very flexible. [I-5]

Student leadership is also effective for awareness-raising for sustainability, as demonstrated by a graduate student who was the leader in creating a new forum, with a key speaker, based on the work of graduating students. University staff, alumni and external stakeholders were invited for the evening, leading to the following participant comment:

Each of the student groups gave an account, gave a little presentation on their projects and [there were a] number of people that emailed me and including some senior people. saying, "Unbelievable: I can't believe what the grads are doing". So, you know, a huge success. So these extra curricular things supporting sustainability, have gone like a rocket. [I-7]

The role of alumni and external supporters in both employing graduates and raising the profile of sustainability programmes demonstrates the role of external leaders supporting university learning for sustainability initiatives. This sends a message to the university and wider community, confirming the relevance and importance of sustainability programmes.

5.4.4 Collaboration of sustainability leaders within the university

Despite the generic problems of moving academics from discipline based learning and research to interdisciplinary (or trans-disciplinary) programmes of learning for sustainability (discussed in Chapter Seven) there are increasing numbers of collaboration initiatives. Some university-wide sustainability learning initiatives are initiated by cross-sectoral leadership, using knowledgeable individual academic sustainability leaders in collaboration with high levels of the hierarchical university organisation, as explained by one international interviewee;

We are currently in the process of assembling a committee to look at structural ways the university might do that ...so there's going to be an element of the vice-chancellors making a decree that all degrees will have [sustainability education] [I-3]

In some universities, individual leaders who are seeking to establish interdisciplinary programmes, work strategically to engage other academics, as described by a New Zealand academic:

I pulled together all the people I thought were interested from all the different faculties and we discussed how it should be set up and what courses they had which we could use as electives so that they'd get some EFTS [Equivalent Full-Time Students]⁹ funding and who would be prepared to be a co-supervisor so that they could get some more money and help. [NZ-5]

One of the reasons that this strategy worked appears to be related to the participant holding a leadership position in a university faculty, as explained:

At that time I was deputy dean, I had lots of contacts and it meant that we could establish an interdisciplinary programme and it was listed in the calendar as an interdisciplinary programme. So, I've had support from all faculties except medicine, didn't have anything that related. It does now in community health. [NZ-5]

Other sustainability operations are in response to initiatives stemming from collaborative leadership within internal sustainability groups, resulting in VC driven changes, as outlined:

⁹ In Aotearoa New Zealand, Tertiary Education Organisations calculate their EFTS units and forward that data to the Tertiary Education Commission, which then pays the education organisation the funding appropriate for the workload for delivering those qualifications to the students.

The VC had representatives from a number of stakeholder groups within the university about greenhouse gas emissions and there's now (university) commitment [I-18].

In an international university where there was mostly rhetorical support for a sustainability research and teaching initiative, a small group of academics who did not hold formal leadership positions, who describe themselves as 'lowly course directors' but who demonstrate their strong collaborative principles and inspired innovative leadership skills, developed a strategy for gaining the support of faculty deans facing a dilemma of how to address declining student numbers. One of the group members describes what they did, demonstrating the ability of distributed leadership to influence hierarchical leadership initiatives:

We said we can help you implement your mandate, and laid out how it is that we thought we could help them realise their mission ... The mission gave us some impetus but probably more importantly I think we realised that we can go to people and say you have said sustainability is important, everybody's said it's important. We're trying to put this programme together and I don't see why we can't just try this [collaboration].[I-16]

There is no apparent blueprint for how individual 'distributed' sustainability leaders within a university seek collaboration with hierarchical university leadership, nor how hierarchical leaders collaborate to progress wider university sustainability initiatives. Each participant described different scenarios that were the result of the unique situation faced by that academic within their specific university.

In one university, faculty leaders collaborated to promote interdisciplinary sustainability focused education, seeing it as an opportunity that could help break the fortress mentality of those academics intent on defending their academic silos, refusing to take part in innovative learning and research initiatives, despite the landscape changing around them. As the interviewee explains:

[Our] university has been built around faculty empires and they're big empires and there's huge quantities of money involved. And huge amounts to control it but we also run the silo factory - there's huge border protection issues. And so meeting the interdisciplinary call is a challenge. This is an issue that the current administration seems to be somewhat more focused on and is seeking ways of trying to erode those faculties. And when I gave the briefing to the deputy vice chancellor in charge of academic affairs and he's looking for Trojan horses if you like, to start collaboration in the faculty areas and he saw the sustainability one as being a non threatening intellectually credible strategy to try and start chipping away at the fortresses. [I-7]

In another international university, financial challenges arose when a trans-disciplinary Masters sustainability programme was designed, with very different opinions about the worth of different disciplinary academics taking part in the programme. In that example the deans of all involved faculties were persuaded to contribute to the development of the course and then receive income from the course on a pro-rata basis. In addition, the director of the course, in collaboration with the fees setting division of the relevant faculty administration and Deans made sure that the income from the fees paid by the students would cover the higher costs of the course, reflecting the higher status expected by external advisory committees, apparently more in touch with societal expectations than those within the university. Some sustainability learning initiatives are initiated by cross-sectoral leadership collaboration, at high levels of the hierarchical university organisation, as explained by one participant:

We are currently in the process of assembling a committee to look at structural ways the university might do that ...so there's going to be an element of the vice-chancellors making a decree that all degrees will have [sustainability education]. [I-3]

This participant goes on to explain how hierarchical leadership is influencing distributed leadership and illustrates this with reference to writing a core sustainability unit across all degrees. The comment is made, with respect to leadership involvement:

Each of the deans nominate someone in their faculty ... the deans will need to authorise them to represent their school so each school feels that its interests have been represented and taken into account in the writing of the unit. [I-3]

In some universities the development of sustainability focused post-graduate programmes have been advocated for and strongly supported by leadership at the Deans and Vice-Chancellor (VC) levels, as described:

Our VC was a wonderful man ... [who] felt, through the 60s and 70s that environment wasn't being addressed in a really inter-disciplinary way. He really understood inter-disciplinarity and had quite a huge vision and incredible leadership. [I-17]

Another strategy used by university leaders to support capacity building for sustainability teaching and research is by hiring suitable sustainability leaders, as explained here:

We just hired a new Dean and the President in the hiring of that new Dean was wanting to highlight environmental studies ... he is also very much an interdisciplinary scholar. It helps in this pulling together of different disciplines like hiring right from the beginning [of the post graduate programme] which I think helped too. Other academics still complain that they don't find the kind of commitment and interdisciplinary knowledge [in other universities]. [I-17]

Within a faculty, there can be an opportunity to employ lecturers and researchers under specific conditions, specifically to create a learning situation that benefits students learning for sustainability. For example, for a sustainability course in a New Zealand university:

We took a philosophy that where possible staff had to be partly employed externally, so the focus was applied, so that we didn't compete head on with disciplines. Where you have to have people from many institutions has in some ways helped because you need to pull in a team. And it's a team which is outside of the university usually as well. Those people are not panels of the same discipline. I think that's useful. [NZ-5]

The Australian Vice Chancellors' Committee policy on Education for Sustainable Development (Appendix 10) is a current example of how high level leadership aims to influence all Australian universities. This policy states that "Through this policy the AVCC declares a commitment to Education for Sustainable Development, and will strive to ensure that universities are a major driver to society's efforts to achieve sustainability" (AVCC, 2006).

All these examples of sustainability leaders, from individual academics to groupings of hierarchical university leaders are seeking to transform university practices, away from the current modern non-sustainable paradigm of increasing resource use and increasing negative impacts on the global environment. I suggest that changes to a sustainability paradigm will require transformative changes in academic teaching and learning pedagogies, if universities are to manage credible transformations in institutional operational and management practices for a sustainable future.

Table 5 compares key strategies used by international research participants for gaining support to successfully implement education-for-sustainability initiatives in their universities, with those strategies attempted by participants from Aotearoa New Zealand.

Table 5 Comparison of Strategies, reported by participants as useful for gaining support for EFS

Strategies	International Participants	Aotearoa New Zealand Participants
International and government policies	Wide range of leverage from and collaborative research with agencies	No reports of successful substantive leverage from these policies.
Stakeholder partnerships	Employers and Alumni engaged in advisory and collaborative research and teaching	Limited but increasing engagement with stakeholders
Stakeholder & Student demand	Respond to demands for sustainability learning from employers and students	No reported evidence of substantive demand
Collaboration with individual academics	Many examples of shared trans-disciplinary teaching and supervision and research	Very few examples - limited opportunities
Collaboration with leaders/academics	Continued and increasing levels of collaboration	Examples of frustrating efforts. Some recent, limited progress reported
University policies	Extensive use of these policies	No reports of successful use, (policies only relatively recently developed in some universities)

5.5 Embedding support for education-for-sustainability

All participants mentioned, at some stage during discussion, that a key factor for the success of any education-for-sustainability initiative is the level of hierarchical leadership support, and institutional commitment to moving towards a learning paradigm for sustainability. Participants also expressed concern about how to access the support needed for further progressing innovative changes in teaching pedagogies and course structures to enable teaching for sustainability. Another concern is how to collaborate in procuring funding for sustainability research and engaging in more sustainable operational and management practices.

Where there is explicit institutional commitment, then a range of different strategies and opportunities are available for encouraging and expecting transitions toward a general sustainability paradigm, as is demonstrated in the following sequence:

What we are trying at this stage with sustainability is bringing to departments that we do this, there is an institutional commitment to it. What we do now is talk about how faculties and departments begin to internalise this. [I-7]

This leading, after further discussion to:

doing things like embedding it in learning, in the day to day operations of departments and things. We've chosen two faculties to try ... well there are bits happening in all faculties because of things like the environmental officers set up and full strategies for sustainability. [I-7]

Providing time and space for sharing sustainability learning through forums, helping to create a profile while enabling students to showcase their achievements, was acknowledged as important by participants from both groups:

I mean with the commitment across the university in conjunction with the Masters programmes - we set up what's called the sustainability forum. We had one, about energy savings. And this was not one that was going to drag in the people from outside you'd think necessarily but we had the Vice Chancellor and the head of the environment division operations ... and apparently 200 people showed up to this, at 7 o'clock in the evening. [I-7]

We have a graduate day when students present talks and posters and we invite the broadest community in and the prize money has been as high as \$1,000 for the worthy paper from outside. Totally organised by the students and it helps create a face... [I-5]

These previous comments are representative of those made by participants involved in establishing, strengthening and enlarging a distributed network of leaders, where individual leaders who are academics, students, research assistants or management staff are supported and encouraged in their new initiatives. As implied by three international research participants, and supported in the literature on case studies of sustainability learning, communities of interest become important for supporting and building capacity for more sustainability teaching and learning amongst academic, management and operational staff.

Other networks acknowledged as supportive are those external to the university, for example the increasing numbers of international journal publications and conferences with a focus of education-for-sustainability. These are providing opportunities to contribute to collegial debate and knowledge sharing of emerging disciplinary movements towards engaging with the sustainability discourse. There is also the fact that isolated individuals can seek support in the wider academic community, as described here:

you have isolated individuals who feel supported by networks which are outside their university. So they go to conferences with other isolated individuals in their universities and feel some kind of solidarity and exchange in the [sustainability leadership] experience. [I-13]

An example of where initial collaboration for a sustainability initiative can lead to new student-centered learning programmes is from a Canadian university. Initially Vice Provosts and faculty heads were supportive of the operational sustainability office idea because millions of dollars of savings could be made, for example in electricity costs, over the years. This office then provided faculties with opportunities to collaborate on student sustainability research projects, coordinated through the office, enabling co-learning between students, academics and operational management staff. From this base, academic interest and knowledge and pedagogical capacity was built to develop formal sustainability learning programmes for students.

5.6 The key role of hierarchical university leadership support

A common theme expressed by contributors to the academic literature on the role of higher education-for-sustainability (as discussed in my Literature Review) is recognition that formal education, as practised in the university, continues to contribute to the problem of unsustainable practices. Current academic management and teaching and research practices that developed over many decades have resulted in a fractured, discipline-based and generally competitive, individualistic academic culture.

Therefore, despite small groups of researchers, lecturers and management personnel introducing a variety of more sustainable practices, large sectors of the university remain fundamentally resistant to change, notably pedagogical change. This is in direct contrast to increasing societal demand for more education and research by universities to enable improved and sustainable solutions to environmental and social issues.

The importance of university leadership support was identified as being essential for enabling new sustainability courses to become integrated into university programming. These following comments from participants from five different

universities, in three different continents, all stress the importance of hierarchical senior leadership support for sustainability education:

the university won't go, nothing moves without either the President or the VP's being behind it. [I-17]

We found a lot of rhetorical support but again no kind of mechanism and then the one other piece, the one single event that made the biggest difference I think was our president of our university who is nationally known if not internationally, She was proposing a mandate for the university or a mission [of sustainability] for the university. [I-16]

Institutional Support was critical ... our most critical support was that of the Deans, and VC. [I-4]

We've now got support with the VC, the VC is a champion [for sustainability education]. [I-12]

we had a previous Deputy Senior Vice Chancellor I was able to convince him of the critical need [of sustainability] for the future of the university, the school I guess. So he supported us to some extent and allowed us to grow. [I-11]

One interviewee asserted that:

A high profile independent champion was hugely important, to us,
and then surmised -

It may not be important for every institution. [I-5]

However, I found no evidence of substantive sustainability practices, including new pedagogical practices, that had been integrated without high profile university support. In contrast, there are difficulties in establishing and further developing sustainability programmes when there is no leadership support, for example:

You need a leader. We've struggled without a really good champion [in the hierarchy]. [I-14]

The New Zealand university leadership attitude to sustainability teaching and learning is criticised by all New Zealand interviewees, with comments similar to these:

Management have no idea and no interest in sustainability and in what could be future-looking courses. No resources are allocated for future needs in teaching, for example, climate change. There is no appreciation of issues, investing in future, no strategic development for the future. [NZ-4]

There's got to be enough people at a high level to see it as something worth doing before it can happen and I know that those conditions are starting to shift. [NZ-10]

Individuals comment on the lack of useful mechanisms for change within the university:

We need role models of collaboration that are then options to be implemented ... and university management itself is not there. [NZ-3]

All participants mention the relevance of institutional support, succinctly stated by one person as:

Institutional support, especially the Deans level, is very important. [NZ-7]

Analysis of the interviews reveals that all participants believe supportive hierarchical leadership is essential for the effective implementation of sustainability-focused programmes of learning. This senior leadership is needed for assisting change, either by promoting and forging new sustainability initiatives, changing policies or removing university practices contributing to resistance to change. The importance of 'senior' positional level commitment, as a factor to be considered when seeking successful integration of education-for-sustainability, is discussed further in Chapter Seven, section 7.4, and throughout Chapter Six.

Whatever the process for developing and implementing sustainability initiatives, all international interviewees referred to the need for strong and supportive hierarchical leadership to move beyond institutional 'challenges to change', to connection and collaboration that enabled implementation of new programmes.

All New Zealand participants lamented the lack of evidence of hierarchical leadership understanding and engagement with a sustainability paradigm, and in particular the lack of adequate institutional support for developing and establishing new, inter-disciplinary education-for-sustainability programmes. No-one from this group of academics spoke of the possible relationship between styles of leadership and the lack of institutional support, compared to international participants who commented on the ability of university leaders to engage and convince other faculty leaders to become involved in sustainability transitions.

The initial research questions (Chapter Two) can be reframed in the context of leadership as:

- what external and internal factors influence university leadership support for implementing education-for-sustainability initiatives?
- how do university leadership processes influence academic teaching and learning for sustainability?
- which leadership models/frameworks are likely to be effective for leading transformational changes needed for sustainability initiatives?
- which leadership models provide a connected framework within which sustainability focused university leaders could operationalise their initiatives?

When the research findings are examined, in relation to underlying themes and the emergent leadership theory, then it becomes apparent that the above questions can be explored in more depth, in relation to current and preferred modes and models of leadership (Chapter Six). The influences and processes affecting university sustainability initiatives are further discussed in Chapters Seven and Eight.

Analysis of the similarities and differences expressed by the thirty research participants, in relation to the success (or otherwise) of establishing substantive university learning and teaching for sustainability initiatives reveals two key themes:

that supportive hierarchical university leadership is key to transformational university wide sustainability initiatives, and

that connection and collaboration between distributed and hierarchical leadership for sustainability is important for progressing changes to a sustainability paradigm.

These key themes are supported by additional informal discussions with a range of academics and recognised sustainability leaders, as well as implicit and to a lesser extent explicit reference to these features in the growing numbers of case studies of sustainability initiatives in the literature.

My main interest is how hierarchical and distributed transformational university leaders for sustainability can function collaboratively, within a network of connections that influence the motivation of ‘others’, to make changes they may

otherwise not have made, leading to transitions towards a more sustainable future. According to Corbin and Strauss (1987) it is this interest, reflexivity and constant questioning and reference to findings and possibilities that leads to generating theory from data, in the tradition of grounded theory.

In Chapter Six I take my findings and discuss, with special attention to the two key themes, the development of my theoretical model; an active dendritic framework for university leadership for sustainability.

5.7 Summary

**Never doubt that a small group of thoughtful, concerned citizens
can change the world. Indeed it is the only thing that ever has.**

Margaret Mead (1901-1978)¹⁰

In this chapter I have provided an overview of the results that contribute significantly to developing an understanding of the probable reasons for current low levels of engagement with sustainability learning initiatives, in universities in Aotearoa New Zealand. I have presented a number of themes underlying a wide range of processes that emerged from the data, linked explicitly or implicitly to leadership.

General themes were connected in a variety of ways, and these themes were more important than any individual process identified within the different processes undertaken by ‘lone-ranging’ distributed sustainability leaders to initiate and progress university sustainability initiatives.

These themes provided the framework for the organisation of my findings. My findings suggest that the strategies and processes for implementing education-for-sustainability in universities depend greatly on the specific context of the particular university, in relation to current learning for sustainability initiatives. Analysis and reflection of the leadership processes used revealed an underlying theme directly

¹⁰ Attributed to Margaret Mead, believed to be a spontaneous and informal remark reported in a newspaper, but actual source unknown.

relating to the connectedness and active collaboration between distributed and hierarchical leadership for sustainability in universities.

The twenty international participants (from sixteen universities in five countries) provided information about the sustainability learning initiatives in which they were involved and described how those university programmes were developed. The successful implementation of such a wide range of programmes indicates that there are many opportunities, across a range of disciplines, for implementing substantive education-for-sustainability programmes in universities.

Ten New Zealand participants (from four universities) shared information about developing their individual sustainability focused papers and courses and one described the implementation of a programme with a strong sustainability focus.

All participants commented on a range of generic university barriers and contextual challenges they had faced when attempting to develop and implement new sustainability initiatives programmes, or courses and papers. Representative interviewee comments describing these cultural, institutional, management, pedagogical and funding challenges are presented in this chapter and discussed further in Chapter Seven. Despite the existence of university barriers, many successful strategies have resulted in building enough capacity and support to overcome many of the challenges, as noted in the third theme of this chapter.

Interviewees demonstrated their unique role as individual leaders for sustainability, within their faculties, when providing descriptions of the strategies they used for building support for learning for sustainability within the university. These processes are grouped into the following themes:

- responding to international, government and stakeholder groups and alumni expectations and,

- active collaboration possibilities within the university, including distributed and hierarchical leadership connections.

In the tradition of grounded theory enabling further interpretation of results, I present and discuss more results in Chapter Seven. These include connection and

collaboration strategies, within a dendritic framework, that are likely to assist education-for-sustainability initiatives.

My overall findings are based on in-depth, deductive analysis of my results, using grounded theory methodology coupled with extensive reflection, and informed by my twenty years of working in the field of environmental education-for-sustainability. These findings are supported by a comprehensive literature search, plus discussions with other informed academics and suggest that:

Hierarchical leadership support is key for the successful implementation of faculty and university sustainability programmes, and reducing the effect of challenges to progressing that new learning.

Collaboration between distributed, individual academic sustainability initiatives is needed for building capacity and gaining support from university leaders for sustainability learning initiatives across the university.

All participants commented on the importance of effective hierarchical leadership support, to enable the development of new sustainability learning initiatives within the university. The need for institutional commitment to a paradigm of sustainability was noted as a major impetus for moving away from operational and teaching practices that contributed to further unsustainable actions, to a new twenty-first century sustainability paradigm.

Participants from Aotearoa New Zealand described the lack of effective university hierarchical support, the lack of substantive policy and iterated institutional support and linked this to the lack of a clear and visionary national strategy for future social and environmental sustainability. International interviewees also noted that without effective hierarchical leadership or institutional support, individual distributed leadership efforts fail to achieve the capacity required to create opportunities for transforming institutional practices.

Analyses of research participant statements, supported by discussions with other interested academics demonstrates that without the support of key hierarchical leadership, fragmented sustainability learning initiatives remain both dependent on a small group of committed individuals (leading to varying levels of ‘burn out’) and external to the non-sustainability paradigm of the modern university. Furthermore, these distributed fragments provide learning for sustainability to only a small minority of the total population of university students and very few staff.

The experiences of the international participants demonstrate that two connected models of leadership are important for building sustainability initiatives. One is an institutional ‘hierarchical’ (or positional) model and the other individual or small group ‘distributed’ leadership. Both these models of leadership are important for facilitating a change to a sustainability paradigm, and more particularly, when operating as connected models within the university institution they enable wider engagement in sustainability initiatives. Once the learning for sustainability journey is under way, collaboration between both distributed and hierarchical leadership continues to be needed for embedding ongoing support and further developing university education-for-sustainability.

Examination of the progress made in universities, both in developing and continuing current sustainability initiatives, leads me to deduce that where both modes of leadership (distributed and hierarchical) are working collaboratively, academics became more involved in learning for sustainability and developing and enhancing different teaching pedagogies. As well, academics become engaged in research into a wide range of sustainability issues and become stronger supporters of operational sustainability practices.

Reflecting on the connections, interactions and transmissions from one mode of leadership to another led to my theorising that an interconnected model of transformative leadership (Chapter Six) could provide a useful framework for strategising and developing initiatives for sustainability education in universities.

In the following chapter I explore the role of transformational leadership for sustainability and describe how the themes of leadership that emerged during analysis of my results lead to inductive theorising (within an ecological paradigm) resulting in generating a theoretical model. This model (an *active dendritic framework for university leadership for sustainability*) is discussed in relation to current leadership models and proposed as useful for assisting current and future leaders for sustainability to strategise and implement actions for sustainability teaching and learning.

In Chapter Seven the role of university contributions to sustainability and the challenges to those contributions are explored further, with reference to my research findings and the literature related to education-for-sustainability.

CHAPTER SIX

University Leadership for Sustainability

- An Active Dendritic Framework

Leadership and learning are indispensable to each other.

John F. Kennedy (1963)¹¹

6.1 Introduction

Scholars contributing to the education-for-sustainability discourse, including Blewitt (2004), Filho (2000, 2002a, 2002b), Sterling (2001) and Tilbury (2004, 2005) argue that leadership across all sectors of society is needed in these current times of ecological and social crises and further contend that university leadership should play a critical role in the change processes needed to effectively meet learning challenges for a more sustainable future. Contributors to the wider sustainability debate, including Cortese (1992, 2003a, 2003b), Dresner (2002), Gare (1995), Hawken et al. (1999), Hawken (2007), Porritt (2005) and others contend that a paradigm change is urgently required, for future focusing and re-designing society's organisational systems to meet current and future social and environmental challenges. My research supports these views and suggests that leadership initiatives are critical for enabling transitions to a new sustainability paradigm, one that builds on the increasing awareness of our human interconnectedness and dependence on nature, as discussed in Chapter Two.

In this chapter I explore the leadership themes that emerged from the analysis of my research data, as presented in Chapter Five. Using grounded theory methodology led to the emergence of two general themes related to the importance of leadership for both enabling and growing sustainability learning initiatives in universities.

¹¹ Kennedy, J.F. 1963a. Speech prepared for delivery in Dallas the day of his assassination, 22 November 1963

These emergent leadership themes indicate that:

Hierarchical leadership support is key for the successful implementation of faculty and university education-for-sustainability programmes, and

Collaboration is required between individual academic sustainability leaders, distributed across the university, for building capacity and gaining support from university leaders.

Following the emergence of these themes my initial research questions were reframed within the context of leadership (Chapter Five, section 5.6). I focused on understanding how distributed and hierarchical university leadership could connect and forge collaborative relationships more easily, in order to increase their capacity to develop and establish wider university sustainability initiatives. This led to investigating whether there exists a framework that leaders for sustainability can use to connect and collaborate more easily, to build greater capacity more promptly to incorporate and integrate sound educational and operational sustainability practices, within a new sustainability paradigm.

According to my research participants and contributors to the current education-for-sustainability literature (Blewitt, 2004; Filho, 2000, 2002a, 2002b; Palmer, 1998; Sterling, 2001; Thompson, 1997 and Tilbury, 2004, 2005) universities continue 'business as usual' with minimal efforts to move towards sustainability in the current paradigm. Current low levels of collaboration and limited active networking of sustainability leaders (as described by research participants) may help explain why fragmented sustainability initiatives fail to effect wider change in universities.

I suggest an analogy that may be useful: that these fragments are equivalent to the scattered pieces of a complex jigsaw, with no visionary frame or collaborative mission to facilitate some sections joining, then completing a more coherent picture of university sustainability. Active processes are needed to assemble the jigsaw pieces in order to create a new sustainability learning scene.

Therefore, I am proposing a framework that may be used in order to identify, locate and collaborate with individuals and groups involved in initiatives for sustainability

within the university. Also, this frame may provide a way of mapping connections to locate and focus on individuals and groups more likely to engage as co-operative actors for actioning pedagogical learning for sustainability. This ‘dendritic model’ uses the metaphorical platform of the living nervous system, encourages activation of connections and collaboration of effort, leading to more timely initiatives.

In this chapter I focus on the development of the theoretical framework, with reference to the key themes emerging from the research findings, discussing these with reference to further literature and within the context of university leadership for sustainability (as reviewed in Chapter Three, section 3.5). In addition, I explore some possibilities for using this theoretical model to provide a framework for action, to help progress wider sustainability initiatives within the university, leading to a new university paradigm of sustainability in the twenty-first century.

6.2 Leadership for Sustainability

According to Astin and Astin (2000), any individual academic who wishes to be part of changing the teaching and learning environment can begin to do so, in effect showing leadership. There are hundreds of small re-orientations and transitions for sustainability that can easily be made. However, I have no evidence from my study, nor found evidence in the literature that isolated, fragmented changes lead coherently to the institutional paradigm changes that could enable better learning for sustainability by the thousands of students and teachers within universities.

Participant experience (Chapter Five) indicates that where fragmented individual initiatives are operating, without connected leadership and with no cohesive principles or guiding mission, universities fail to provide authentic sustainability education to their students. The corollary to this, that hierarchical (or positional) leadership that supports individual, distributed teachers for sustainability underpins the success of substantive university learning for sustainability programmes.

Interviewees from universities in Aotearoa New Zealand express concern about the disjunction between their teaching about and for sustainability and the non-sustainability contexts that students experience both in other learning areas and their

university surroundings, operationally and philosophically. As one participant explained:

There are no real links with operational management issues at this university – apart from ad hoc links. Some environmental management staff and student groups organise occasional seminars, tree planting etc. Often teaching sustainability within a department it is seen by others as ‘just another course’. This is a real frustration for people who teach in these courses and believe in sustainability but their management doesn’t regard it as important. [NZ-3]

I suggest one of the reasons there is a disjunction between new sustainability learning and operational and academic management is because new academic insights and practices are transferred so slowly, by osmosis, through seminars, conference presentations and chance discussions, over time. Transference through peer-reviewed journals can be measured in years, gradually and at the mercy of other ‘concentrations’ of interest by either the editorial committee of the journal, or the peer reviewers for a journal.

Given the paradigm change that is needed, as quickly as possible, away from non-sustainability as evidenced by accelerating consumption and climate change, I argue that individual education-for-sustainability initiatives on their own are not sufficient to lead to timely change in universities. History, as they say, is paved with individuals’ good intentions, but individuals need to connect with others and collaborate within a shared vision, to enable capacity building for reaching the ‘tipping point’ for motivating and implementing wide-spread change in any organisational system.

Responses from all the international research participants in this study confirmed the importance of ‘influencing’ leadership for enabling connections and conduits for more rapid dissemination and interchange of ideas, for teaching and learning for sustainability. This finding is reflected in the increasing numbers of case studies of good sustainability educational practice, collected in Bartlett and Chase (2004), Blewitt and Cullingford (2004), Filho (200a,2002b,) Filho and Carpenter (2006), Forrant and Silka (2006) and M’Gonigle and Starke (2006). Many contributors either comment or infer that leadership and styles of leadership play a role in the successful development of sustainability initiatives in their university.

Ramsden, a leading contributor to the leadership literature declares; “we have seriously underestimated the power of leadership in higher education” (1998:3) and suggests that if organizations are struggling to progress in a world of change then a focus on effective leadership styles is perhaps the most practical and cost-effective strategy they can consider. Features of transformational leadership (Bass, 1985, 1998; Burns, 1978, 2003) relevant to envisioning, connecting to others, sensitivity to the needs of others, inspiring collaboration and being prepared to initiate needed changes are well supported in the leadership literature. It would appear that all are important for the style of transformative university leadership needed in these turbulent times.

All participants I interviewed, both formally and informally, had a comment (and some had detailed stories) about the importance of supportive leadership, and the problems encountered when strong leadership support was lacking. A range of representative comments explicitly or implicitly reflecting this leadership theme are presented in Chapter Five, Section 5.6.

Ramsden (1998: 36) points out that “at times like this, other organizations have found they need visionary leadership and excellent management if they are to endure and grow” and focuses on the skills and attributes that an academic leader needs. According to Ramsden, academic leaders need to show features of transformational leadership to create a new academic learning organization, including motivation, shared vision, thinking about old problems in a new way, collaborative learning, and seeking change in a positive way.

Throughout the leadership literature, claims are made that it is transformative leaders who have the ability to iterate their preferred vision to their group or organization, and are able to encourage and empower their colleagues and followers to envision a preferred future, one that can be attained through change processes that are collaboratively designed and managed. Alimo-Metcalfe and Alban-Metcalfe (2005:53) suggest that charismatic, transformational, transactional and visionary leadership models are part of the ‘new paradigm leadership’, one which “is seen primarily as a social influence process”.

Transformative leadership, as described by Bass (1985, 1998) and Burns (1978) can provide the guiding principles for exciting academic teaching, particularly through collaboration and planned coordination of varied initiatives, for achieving the goal of learning for sustainability. Burns (1978) identifies two types of transformational leaders: the revolutionist, who operates on changes to the whole organization, and the reformer who operates on the parts, seeking harmony with existing trends and prevailing movements. Burns' "reformer" is exemplified by those isolated sustainability leaders within the university who are changing their own practices, in response to the increasing global and local sustainability challenges, and motivating and influencing others in their disciplines as they do so.

It is apparent that these attributes remain fundamentally the same, whether the transformational leadership is hierarchical, dispersed (Gordon, 2002), distributed (Gunter and Ribbins, 2002) or shared (Parry 2001). Transformational leadership is described as a 'leadership type in which leaders possess charisma and provide intellectual stimulation, individualised consideration and inspirational motivation to followers' (Beugré et al., 2006). Beugré cites many researchers who support this description and there is ample evidence in the literature that inter-personal, political and social skills are considered greatly important in a transformational leader. The importance of inter-personal skills for advancing sustainability initiatives was mentioned by many research participants, for example:

If we don't have continuing champions for this work, people who are good with relationships, its going to be difficult to maintain the momentum [I-15].

6.3 Connecting the Leaders – for Sustainability

Participants from universities in Aotearoa New Zealand express concern that they do not know who else in their university shares their focus on student learning for a sustainability paradigm (Chapter Five, section 5.4). This highlights the problems of dispersed, individual leaders operating without a framework for connecting other sustainability actors, typically because there is no central coordination or hierarchical leadership support for sustainability in their university. Connecting with other isolated or 'dispersed' leaders, and seeking connections to the hierarchical university

leadership networks, markedly increases the opportunities for collaboration, learning, sharing, and implementing positive change for sustainability.

As discussed in Chapter Three, I share Gordon's (2002) disquiet about new models of dispersed leadership, preferring instead the reality of the 'inherently distributed nature' of educational organisational leadership, as discussed by Gronn (2003). I suggest that within the university, changes towards a sustainability paradigm will depend considerably on the strength of the connections of distributed leaders, needed to deflect and overcome many of the challenges discussed in Chapter Seven.

However, as previously discussed in my research findings (Chapter Five) and discussed further in later chapters, if there is no supporting energy from the hierarchical leadership then those fragmented initiatives remain separate, functioning in sustainability silos instead of building collaborative transitions towards deeper sustainability learning outcomes, for students and the university.

In the leadership literature, it is transformational leaders who have the ability to iterate their preferred vision to their group or organization, and are able to encourage and empower their colleagues and followers to envision a preferred future, one that can be attained through change processes that are collaboratively designed and managed (Bass, 1985, 1988; Burns 1978, 2003; Judge and Bono, 2000; Koh et al., 1995). Stone et al. (2004) note that a transformational leader focuses on the organisation and leads in such a way that the actors/followers also build commitment to the goals of the organization, in comparison to a servant leader who focuses on the development of the followers, so that organisational objectives are then met. According to Stone, both transformational leadership and servant leadership, although different, offer the conceptual framework for dynamic leadership. However, it is unlikely that servant leadership in a university organization could operate effectively for timely change, given the challenges discussed in Chapter Seven.

Our future, and indeed the present, differs so greatly from the relatively settled and incrementally changing environment experienced when many current university academics entered the academy that I suggest it is critical for university leadership to

fully comprehend that changes are needed in teaching pedagogy, for effective future-focused student learning. If all academics understood this, and were invited to share this commitment, then a connected purpose may encourage collaboration for a collective vision - learning for sustainability - that empowers students and staff to make positive changes for the future.

Parry (2001) maintains that Antipodean leadership in the twenty-first century has changed and that effective leadership is a 'shared activity', with leaders and followers helping each other: "therefore the relationship between leader and follower is a reciprocal relationship" (ibid.:234). This observation supports my proposal that leaders at all levels and across all sectors of the university should be engaged in supporting the re-design of university programmes to meet predicted sustainability challenges. No-one can afford to leave leadership in this arena to 'others', and every academic and management person can be collaborating as co-leaders in a number of start-up initiatives, be they learning groups, operational change groups, support groups for student-led change, communities of practice developing and implementing new learning programmes or integrating sustainability learning into existing programmes.

There is also the possibility of quite different scenarios, where individual perceptions of how universities operate as organizations for change differ, particularly if some academics fail to recognise that change can create opportunities for improved student learning and concentrate only on perceived system limitations. If they are relatively comfortable with their current role, lack energy and lack understanding of the moral responsibility for engaging in personal development, to facilitate quality learning for their students, it is unlikely they will engage in learning for the twenty-first century.

When new frameworks and initiatives are proposed, some academics deeply embedded in the critique culture will immediately cite different 'reasons' for ignoring, avoiding or actively working against initiatives for change. Critical thinking, appreciative enquiry, collaborative learning and reflective responses in areas of complexity, and across disciplines, are not necessarily easy to learn. Nor are they skills inherent in academic culture, but more often reflect the learning styles of individuals, as influenced by their learning experiences and willingness to keep learning.

When discussing the outcomes of centralised power compared to shared power within universities, Ramsden (1998) touches on the possible effectiveness of distributed power, suggesting how this could work in the university, if colleagues support the vision and goals and are involved in planning. However, the models and principles of leadership that are suggested by Ramsden focus more on shared power processes, rather than leadership *per se*.

If transformative, hierarchical leadership was connected with transformative ‘distributed’ leadership networks across the relatively flat higher levels of faculty, school and managerial university organisation, then the connections within the resultant network will distribute information in both directions, increasing the likelihood of reciprocal leadership for a sustainable university. This claim arises from my analysis of the international participant responses referring to the increasing progress in university learning for sustainability when distributed and hierarchical leaders were collaborating for a shared vision for change.

Within the university, because authority tends to be vested in disciplinary, possibly akin to ‘distributed’ domains, disciplinary leaders have exciting opportunities for both initiating collaborative learning opportunities and connecting currently fragmented sustainability leadership initiatives. These leaders are in a position to advance a vision of sustainability – noting this is a paradigm shared with society – to encourage and provide support for more substantive changes in teaching pedagogies.

6.4 A model for enabling Leadership for Sustainability

6.4.1 Overview of emergent theoretical model

Following analysis of the research findings I propose a connected leadership model that provides a framework for strategising how to implement sustainability learning initiatives across the university. This proposed model also helps explain how current initiatives may either fail or succeed, due to the level of activity within the networks of university leadership, the contributions of key actors in the network and the ability to give and receive feedback from internal and external influences.

This model has the following seven key features:

- **interconnectedness, both lateral and vertical, of all sectors affecting and effecting university teaching, research and scholarship,**
- **an ability for active purposeful communication of shared ideas, in a distributed network system**
- **the ability for feedback and feed-forward responses to be distributed,**
- **a system of internal co-ordination,**
- **responsiveness that can be immediate, and/or both considered and timely,**
- **the ability to respond to changes in the external environment, and**
- **a centralised leadership hub, to initiate and coordinate needed changes.**

The features of this model reflect the research findings. All these constructs pertain to a framework for connected leadership and reflect the finding - that effective transformational leaders are critical for influencing and enabling a sustainability paradigm change within the university.

These leaders are connected and responsive to external and internal needs, able to motivate and inspire the collaborative commitment needed across all sectors of the university, and can provide guidance for managing the initiatives for university-wide transitions towards a paradigm *for* a sustainable future.

6.4.2 Seeking a metaphor

Metaphors are widely used when seeking to clarify complex ideas, and many are used to help explain organisational theory, for example biological, evolutionary and ecological metaphors are widely used in the social sciences (Wells, 2006).

In his book *Images of Organization*, Morgan (2006) argues that the use of metaphors can generate numerous ways of understanding how an organisation functions, and reminds us that metaphors have both strengths and limitations. There is no ‘correct theory’ for framing all aspects of behaviours within an organisation. However, the “metaphor can be mobilised at a practical level to create more effective ways of understanding and tackling organisational problems” (ibid.:253).

Using my research findings, coupled with reflective analysis and ‘guided’ by the contextual themes of ecology and biology, within a paradigm of sustainability, I looked for an analogy or metaphor that could encapsulate my ideas. My research findings highlighted the importance of leadership influence and support for extending teaching and learning pedagogical initiatives for sustainability, and changing operational initiatives within the university. Consequently I started reflecting on how processes for reciprocal exchange of new ideas could connect and operate, leading to creating a new sustainability paradigm.

I looked for a living system that was variably responsive at all levels, and could be motivated from a central impulse hub (similar to the university leadership hierarchy) while responding to distributed transformative leadership groups within the university, and external influences. The distributed leadership groups also needed working connections that could forward impulses significant enough to influence responses from the central organisational hub. One of the many wonderful attributes of the human nervous system is that most dominant behaviours, whether emotional, psychological or physical can be transformed through appropriate intervention and re-organisation, to new patterns of more ‘desirable’ behaviour, in this thesis – more sustainable behaviour.

There are many other situations within the university organization that can be compared to the human nervous system, especially the activation role of leadership for sustainability. However, caution must prevail when using metaphors, for while powerful and useful for explaining active networking, the human nervous system is *not* equivalent to the university.

6.4.3 *The human nervous system as a metaphor*

The human nervous system is a useful metaphor for the proposed leadership framework, for a range of reasons, but primarily because of three features:

- transfer of information takes place at any time, in many directions, at dendritic connections across synaptic spaces, in all parts of the system,
- responses to internal and external factors vary, depending on the strength and frequency of the relevant stimuli, and

- responses depend on the context in which the stimulus is received and the motivation of the person to respond.

Using the biological language of the human nervous system in a metaphorical manner helps focus on the possibilities of responsiveness within active university networks (the firing of impulses along nerve cells) and the opportunities for collaborative learning spaces for developing and implementing sustainability education initiatives (equivalent to the synaptic spaces across which dendritic system impulses are relayed). A description of the key scientific biological functions of the nervous system, in combination with simple diagrams helps to explain the metaphorical congruence of the proposed model with the generic communication lines within a university organisation.

The human nervous system (Figure 3) is a fully integrated system, with layers of complexity and, for heuristic reasons, is ‘organised’ into different sectors, as is a university. The central nerve system (CNS) and peripheral nervous system (PNS) are intimately inter-connected and one normally cannot function without the other. The brain is the central ‘command’ hub, which (together with the spinal cord) comprises the CNS and constantly receives and delivers messages, as well as engaging in original thinking. This part of the system is comparable to the ‘first-order’ hierarchical level of university chancellors, vice-chancellors, presidents, deans of faculties and chief executives.

The extensive network of branching nerve cells (also called neurons) that extend throughout all the components of the body – including the head, trunk, arms and legs, toes and fingers and all areas of the skin and all internal organs – is referred to, for descriptive purposes, as the peripheral nervous system. This PNS is comparable to the many networks that operate, or could operate, within the wider university and this is where distributed, or second order leadership and their followers reside. I am not implying that original thinking cannot occur in this level – this is a metaphor, not a scientific comparison.

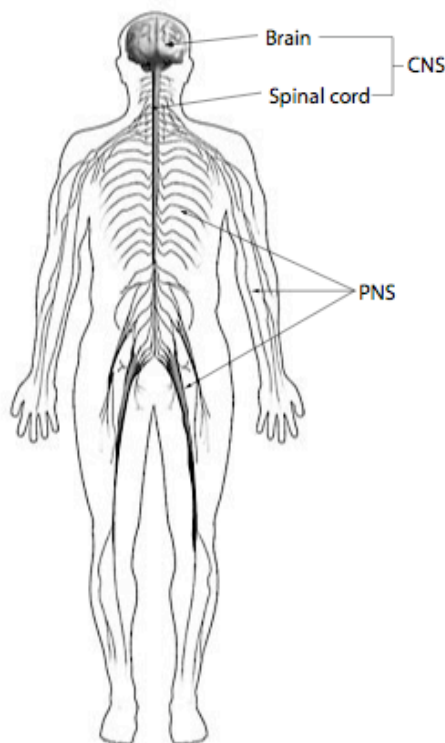
They are continually exchanging impulses, the rate of exchange depending on both the number and strength of different types of stimuli. Reactions may be rapid, continual or

even cease in response to the incoming stimuli. Within the university, an individual academic may exchange information with a positional leader, for example a Vice-Chancellor, and there may be an immediate response or that information may be ignored.

The nervous system, including both central and peripheral systems, is composed of millions of nerve cells, or neurons (either sensory, relay or motor), each with a number of protruding branches, called dendrites. These dendrites form a complex, connected network that enables impulses (information) to be sent in many different directions within the system, by chemical impulses that travel from the synaptic knob, across the synapse to the receptor site of the next dendrite. External stimuli are received through nerve cells in the skin and other sense organs, and result in continual changes to the PNS and CNS.

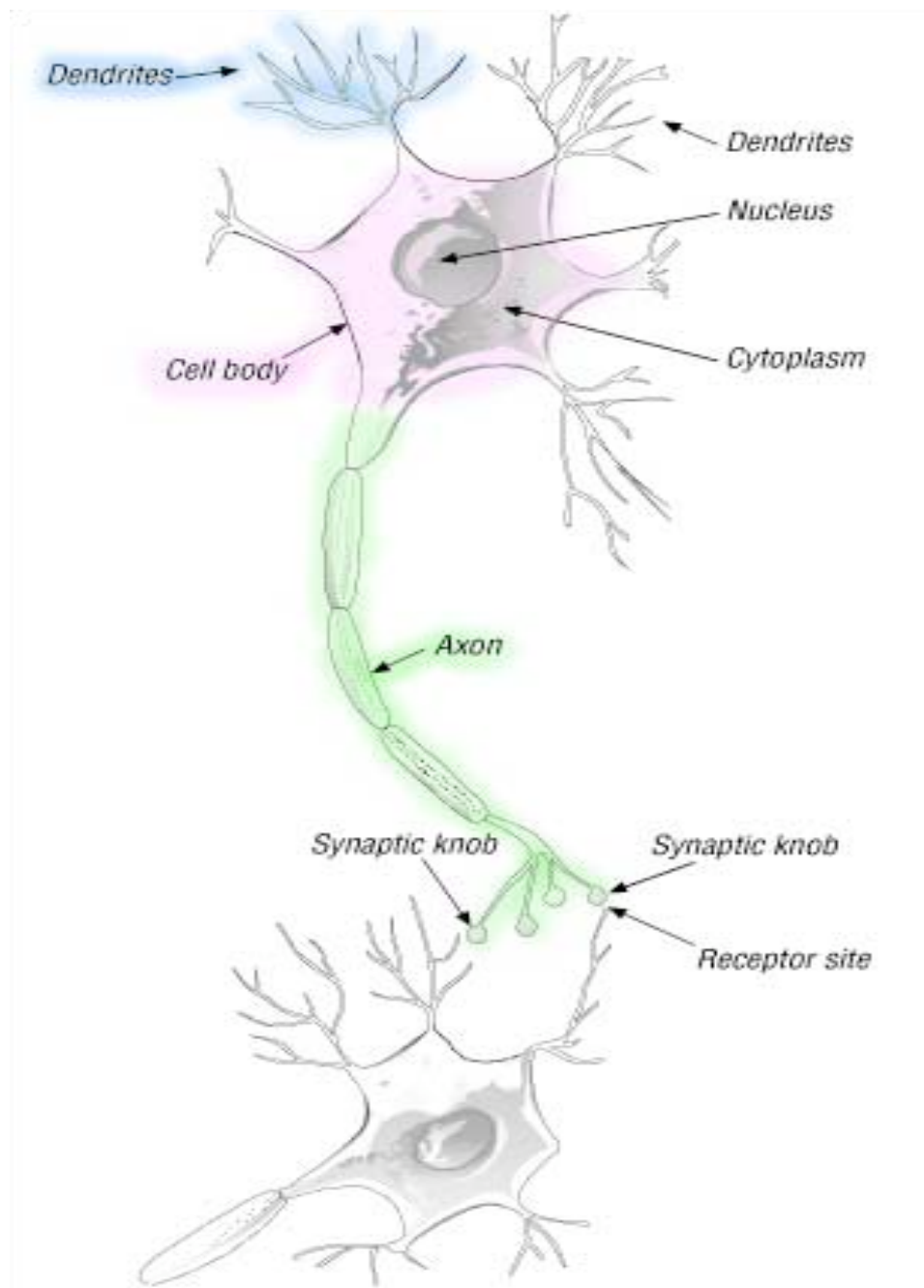
The nervous system metaphor implies extensive interconnections, responsiveness to internal and external stimuli support and 'control' from a central system, able to both initiate stimuli and react to feed-back responses.

Figure 3 Simplified Outline of human nervous system showing CNS and PNS



Neurons, or nerve cells (Figure 4, p.178) are metaphorically equivalent to the thousands of students, academics, researchers, management personnel and stakeholders who at any point in time are able to react to and interact with other people in the university, as well as those residing in external environments, outside the university campus.

Figure 4 Detail of nerve cells with dendritic connections



When comparing the nervous system with the university organizational system (Table 6) it is apparent how multi-layered and inter-connected all sectors of the university are, or should be. For this reason, the same university ‘actors’ may appear in more than one part of the matrix, just as some components of the nervous system have multiple connections to different parts of the body.

Table 6 Simplified matrix comparing the generic organisation of the university to the main components of the human nervous system

Human nervous system	University organisation
Central nervous system (CNS) Brain, hemispheres, lobes Spinal cord Closely connected to the PNS	Hierarchical organisation Governance Executive Committee Administrative Management - CEO Faculty Deans Operational management - CEO
Peripheral nervous system (PNS)	Distributed organisation Faculties Schools/departments Academic teachers General staff Students Operational Management
Receptors of external stimuli: sense organs, skin, eyes, ears, - responding to external environment, send messages via neurons to internal components.	All university staff Students
Nerves (neurons) connect to: All organs, heart, lungs, kidney etc. All internal systems: blood, CNS – brain, spinal cord	All staff communications Student communications Hierarchical communications

All nerve impulses (staff communications) are transferred along the neurons, then the dendrites, and across the synapse (equivalent to the reading/listening/viewing space) to other responsive nerve cells (members of the university).

I argue that my key findings reflect the generic aspects of the nervous system, lending weight to the metaphorical use of the term ‘dendritic’ in my theoretical framework. My key findings, as discussed in Chapter Five are essentially;

- hierarchical transformative *connected* leadership support is critical for *effecting* university-wide transitions to a sustainability paradigm, and

- *connected, collaborative, distributed* sustainability leadership is needed to enable more *effective implementations* of curricula, academic development and operational initiatives for sustainability across the university.

It is the planned, thoughtful and collaborative strategising between these two connected groupings of sustainability leaders that leads to appropriate and timely transitions in the teaching, operations and research needed for future sustainability.

The human nervous system is a useful metaphor for describing how my proposed connected, transformative, dendritic leadership model could be easily and successfully used by university leaders for sustainability when strategising how to progress collaborative learning initiatives. Furthermore I am acknowledging, within this metaphor, the role of both external and internal contextual effects, and the challenges (Chapter Seven) for university leadership to influence and motivate others to engage in learning transitions that lead to a sustainability paradigm.

If no changes emerge, despite collaborative visions, strategies and connected opportunities for sustainability learning, for all members of the university, then I suggest the metaphorical equivalent may be the behavioural challenge that humans face when attempting to alter entrenched habits, particularly addictions.

6.5 Proposed Model: Dendritic Leadership for Sustainability

This proposed model, an ‘active dendritic framework for university leadership for sustainability’ emerged from my key findings: that hierarchical leadership is needed for support of and collaboration with distributed university leadership for sustainability, to enable effective transitions to education for learning for sustainability.

While using the metaphor of the human nervous system to explain how active collaboration is needed for inspiring (the stimulus) and supporting actions (ongoing impulses for healthy functioning) the concept emerged of a model that could usefully frame the networking and collaborative initiatives that will be needed for university learning and actions towards a sustainability paradigm. This model is connected and

organic, responsive to emerging needs and external challenges while managing current tensions that exist in a very diverse organization.

According to Duignan (2003) educational organizations require frameworks within which leaders and potential leaders can be supported by the organization to nurture their development and provide opportunities for leadership to ‘manage’ in environments of ambiguity, challenge and change. In efforts to help guide the processes of deliberate organisational re-design, practitioners and academics have proposed different frameworks, some presented as blueprints for action, with possibilities for adaptation and others as frameworks within which the organisational actors are engaged in designing the system changes.

This latter notion is echoed in the results from my international research data (Chapter Five). Sustainability leadership connections, collaboration and support are important components of a wide range of strategies used for successfully progressing wider university initiatives. These themes demonstrate the organic and responsive nature of strategic leadership action for change. No ‘blueprint’ process for developing sustainability programmes emerged from my results, despite initially (in 2003) surmising that a generic development process for implementing education-for-sustainability programmes may be found.

In October 2007, when researching Australasian educational leadership I found a reference to ‘dendritic’ systems in relation to education, in a conference paper presented by Brown (2003) at the ‘Thinking for Tomorrow Conference’ in Sydney. Brown describes how “the notion of meta strategy was utilised to broadly map and scaffold the initial stage of an ongoing, intentional learning journey” leading to redesigning a public sector education agency in Queensland, Australia (ibid.:1). In his conclusions, Brown maintains that “the experience enhanced the connectivity” and improved the relationships between many diverse stakeholders, leading to improved local outcomes in education. Using the meta strategic framework led to “identification and mapping both internal and external core, dendritic systems of action clearly isolate for schools and service providers the initial means by which support will be provided, decisions can be influenced, and feedback provided on

existing strategies, practices and services” (ibid.:14). However, Brown gives no explanation for using the ‘dendritic’ terminology, and his accompanying diagram shows only linear two-way connections between different educational teams and Principal clusters.

Brown’s framework focuses on specific lines of communication, compared to my theory of a more fluid, connected and collaborative learning environment that will continually build capacity for engaging more sustainability leaders. Nevertheless, there is an ‘echo’ in Brown’s thinking with my theory of a ‘dendritic framework’, arrived at totally independently to other scholarly or practical reference.

I suggest that by viewing the university as a connected, dendritic framework within which there are transformative leaders for sustainability, and promoting collaboration between these leaders, there will be greatly increased opportunities for more effective influencing and guiding (rather than managing) a rapidly expanding range of sustainability initiatives, within the university. As reported by research participants and the literature on case studies of sustainability in higher education, these initiatives include the following:

- Sustainability policy development,

- Sustainable management processes,

- Sustainable operational processes,

- Research with a focus on teaching and learning for sustainability,

- Using teaching and learning pedagogies leading to empowering individual and community action for sustainability, and

- Inter-disciplinary learning and research opportunities, in conjunction with disciplinary expertise, for strong sustainability understanding and action.

In large organizations there will be ‘isolated’ future-thinkers or like-minded individuals, many of whom would like to use their knowledge and ideas to collaborate and contribute towards designing new work systems or learning programmes for sustainability outcomes. Opportunities for sharing, for example

learning groups, workshops and conferences can provide opportunities for academics to collaborate and develop synergistic or new learning for sustainability initiatives.

When there are active, engaging networking opportunities, including calls for contributions to meet sustainability goals within a well iterated organisational vision then those ‘sustainability sleepers’ have opportunities to become ‘sustainability actors’ and ‘sustainability leaders’.

The way that leadership is supported, perceived and actioned will be critical for moving beyond the generic and specific challenges to change within the university, towards needed transitions for learning for a sustainable future.

This dendritic framework is a coherent ‘fit’ with my research findings and provides theoretical answers for the research questions that led to this study, as discussed in Chapter Five, section 5.6.

6.6 Actioning the Model

Within universities in Aotearoa New Zealand there are some individuals either planning or developing and, in fewer instances, actually implementing specific sustainability initiatives. However, as previously discussed, the data from research participants and other academics from universities in Aotearoa New Zealand shows that initiatives operating in isolation or even in small groupings do not lead to substantive changes towards effective university transitions to sustainability. Blewitt, (2004:1) suggests that sustainability goals in education are “occurring in geological rather than human time” leading me to wonder whether recent changes that currently appear to be occurring through osmosis –by gradual absorption through continual exposure – are that much faster!

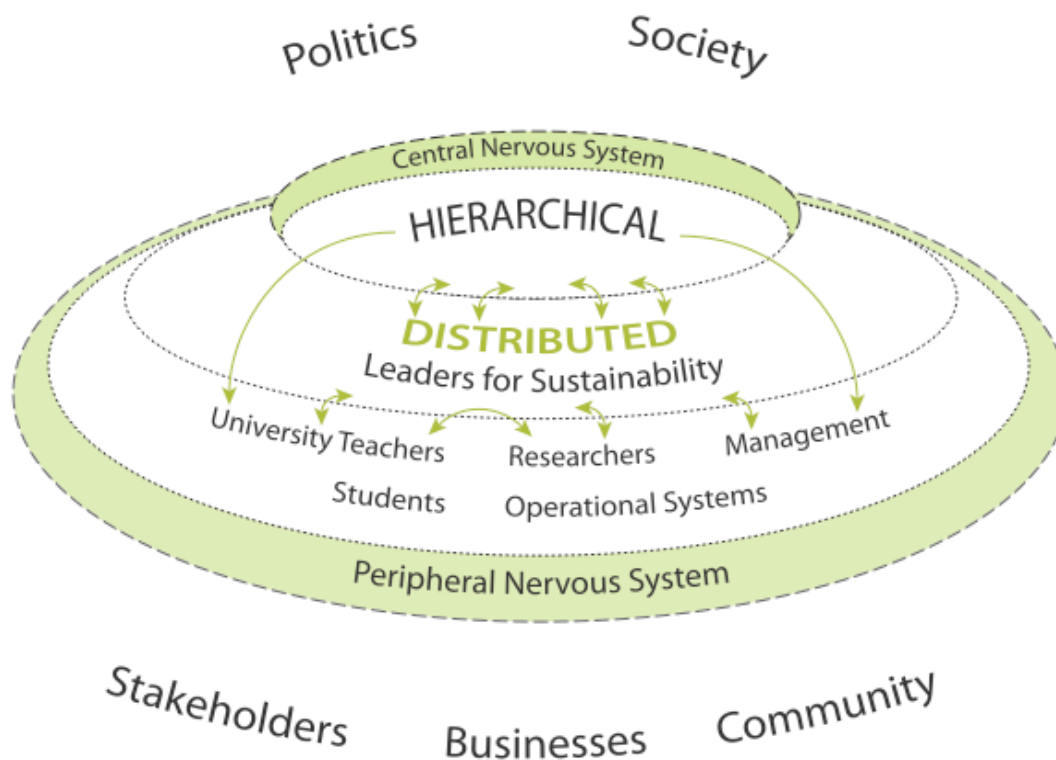
I argue that implementation of teaching and learning for sustainability is not occurring quickly enough for universities to fulfil societal expectations of developing effective leaders for guiding change for a more sustainable future (ULSF, 2000). Given the impacts of climate change, the rising rates of species extinction and the

increasing numbers of environmental refugees, I maintain that comprehensive sustainability learning initiatives need to be implemented *as soon as possible*. For this reason, a focus on the role of leadership for sustainability becomes critical for leading speedier changes in a learning organization as complex as a university.

When reflecting on how to illustrate an active, connected dendritic model for university leadership for sustainability, with an image less complicated than a detailed anatomical style map of the hundreds of lines of communication within a large institution, I re-visited the Conditional Matrix that summarised my research findings (Chapter Four, section 4.6.7). Following further reflection I explored the notion that opportunities exist for the university to be both a critical ‘space’ and a guiding ‘ship’ for a sustainable future. An image emerged of a ‘spaceship’, Figure 5, responsive both to its external environment and the internal sectors that make up the institution of the university.

This university ‘space ship’ is both surrounded by and interacts with wider society and planetary bio-physical systems.

Figure 5 Spaceship for University Sustainability



Ecological, biological and social systems are all highly complex, as are institutional arrangements, as is a spaceship. Humans use metaphors and simplified images to help explain their understanding of complex systems, acknowledging that these explanations remain human constructs of understanding. I am choosing to use the image of a spaceship, with its active, ‘dendritic’ connections and collaborative functions, to help explain (in a simple way) how universities can take intellectual and educational responsibilities for helping guide society towards a preferred, sustainable future.

The many potential leaders in this Spaceship for University Sustainability (Figure 5, p.184) need to be responsive to internal and external influences, while taking responsibility for future-focused learning for sustainability.

Actioning sustainability learning initiatives will depend on many connected factors, including:

- The transformational abilities of those in leadership roles.
- The effectiveness of those leaders to inspire, motivate and support others.
- How leadership roles are perceived, valued and continue to be developed within the university.
- The willingness of academics and general staff to engage collaboratively in visioning, strategising and committing to begin a journey for change.
- The willingness of teaching staff to focus on the future needs of learners, with concurrent action-research for cooperative learning outcomes.
- The systems put in place to support these changes, share effective practice and celebrate coherent sustainability transitions.
- The numbers and activities of those academics, management and operational staff already developing sustainability initiatives, and
- The effectiveness of current communication channels within and between disciplinary areas and institutional structures in the university.

There will be more factors, depending on the influence of external drivers and internal ambiguities within an individual university. Initially, the small consortium of hierarchical and distributed sustainability leaders within a university will need to connect and actively develop a process for involving key actors to help make the decisions critical for building a wider consensus. Wider reaching communication pathways and learning and research processes will need to be identified, if opportunities are to be available for all members of the university community to become involved in professional development and collaborative learning and teaching processes that benefit student learning goals.

In addition, these initial transformational leaders will need to build capacity through supporting emerging connected and shared leadership processes, with a goal of enabling many more individuals to develop and take responsibility for sustainability leadership. The dendritic model expresses the essential idea of connected action and collaboration for a more sustainable university: ecologically, socially and economically.

Using the model as a ‘thinking framework’ helps focus on both the lines of communication (equivalent to the nervous system neurons) between the ‘distributed’ and hierarchical sustainability leaders, as well as the collaborative interactions between those individual leaders. Focusing on the opportunities for encouraging relationship building and active feedback and feed-forward in existing connection spaces (similar to the synapses between the dendrites) may help lead to collaboration for learning and research for sustainability initiatives. This activity may be focused on a ‘disciplinary’ area (an analogy is the lungs of the body) while remaining influenced by and influencing its connections and interface with other sectors that together are working to improve the health of our ecological and social systems (the body).

This framework, with its inherent organic and reacting components within a complex system, provides a positive, interactive model to help guide individuals and organizations strategising for immediate and future changes for sustainability learning. Society is calling for education to move forward, from an educational focus reflecting a past industrial paradigm towards a new sustainability paradigm (Sterling, 2001, 2003; Tilbury, 2004b; UNESCO, 2005, 2006).

There are many ways that a university can start this process. Specific ‘sustainability coordinators’, are employed in some universities, for example the University of Victoria, Canada; Harvard University at Cambridge, Massachusetts; and more recently, the University of Auckland and most recently Canterbury University in Christchurch, Aotearoa New Zealand. These dedicated sustainability leaders are expected to initiate and coordinate operational sustainability, and collaborate with ‘distributed’ academic sustainability teachers to develop links with learning and research opportunities.

Other initiatives include mainstreaming ‘sustainability champions’ (O’Riordan, 1994; Clugston and Calder, 1999; M’Gonigle and Starke, 2006), in order to initiate and activate connections between individuals, across disciplinary faculties and between external stakeholders and university researchers, or establish professional learning clusters. In the United Kingdom over 200 universities and colleges with ‘sustainability facilitators’ belong to The Environmental Association for Universities and Colleges (EAUC), where coordination of operational sustainability practices provides opportunities for linking learning and research to these operations.

Rapidly increasing numbers of case studies are being published (Bartlett and Chase, 2004; Blewitt and Cullingford, 2004; Filho, 1999, 2000, 2002a, 2002b) detailing the success of many different sustainability learning initiatives in those universities taking a leadership role for sustainability. I note that the success of individual case study progress reflects either:

- initial initiatives progressed by distributed sustainability leadership, with the gradual or rapid involvement of supportive hierarchical leadership – leading to relationships for capacity building, or
- a diverse university community receptive enough (to a wider societal concern) to support change processes initiated by hierarchical leadership, leading to distributed opportunities for collaborative learning and implementation of sustainability initiatives.

In order to progress the development and implementation of new sustainability initiatives, university leaders can use this model as a framework of thinking for

identifying and establishing connections with those actively involved and willing to collaborate in implementing timely transitions towards sustainability. An immense wealth of existing knowledge resides in the academy and, through collaborative learning, this knowledge can be connected to develop quality teaching and learning pedagogies for sustainability. Enabling this collaboration sets in motion the transformations needed for building deeper capacity to establish a wider university culture that is positively engaged in learning transitions for a sustainable future.

When new initiatives are planned, the relationships that are actively developed by sustainability leaders with university management and operational staff can lead to further support for sustainability initiatives, especially when opportunities are created to network with like-minded individuals across different, but connected, sectors of the university.

6.7 Summary

In this chapter I have described how my key research findings lead, through using grounded theory methodology, to generating my theoretical model, an active dendritic framework for enabling university leadership for sustainability. I have discussed the transformational leadership, distributed leadership and general leadership for sustainability literature that supports my research findings and have acknowledged how this has helped inform the development of my theory. Also, I have explained how the metaphor of the human nervous system (within the limits of metaphorical descriptions) is useful for explaining how activity, connectedness, collaboration and feedback are inherent in this model.

I have suggested that this holistic model for leadership for sustainability provides a framework for sustainability actors and general leadership within the university to use when strategising how to build collaborative capacity for developing and implementing sustainability learning initiatives. This research has shown that identifying sustainability actors working within other sectors of the university (disciplines, management and operational) is critical when seeking collaboration and support for new initiatives. In addition, active networking is essential for encouraging emerging sustainability leaders to engage with those academics and

university staff in other distributed leadership roles, and together seek collaborative support from hierarchical leadership.

I have argued that my theoretical model provides a connected, responsive and resilient framing tool for individuals to use when seeking to progress initiatives leading to transitions to university sustainability, a new (and needed) paradigm for the twenty-first century. I have noted that this dendritic framework has resulted from comprehensive analysis of my research findings and also that it provides theoretical answers for the questions that led to this study. I have suggested that an image of a university spaceship for sustainability, the space where the connected leaders for sustainability collaborate and guide the ship, in response to the external environment, can be used for encouraging university participation in learning for sustainability.

In Chapter Seven I present more of the research findings, and discuss those findings in relation to the literature that is relevant to the important role that universities can play when making contributions to sustainability. I explore the contributions that universities can make to education-for-sustainability and discuss the challenges to making those contributions, while noting that these challenges can be surmounted – when there are effective connections and collaborations between hierarchical and distributed university sustainability leaders.

CHAPTER SEVEN

Discussion of Findings

University Contributions and Challenges to Education-for-Sustainability

Human history becomes more and more of a race between education and catastrophe

H.G.Wells (1920, Ch.40)¹²

7.1 Introduction

Since the 1980s there has been a slowly increasing number of sustainability education initiatives established in universities overseas, for example in Australia, Canada, Brazil, the European Union, Japan, Mexico, South Africa, Sweden, Taiwan and the United States of America. During the first decade of the twenty-first century, a steadily increasing number of sustainability curriculum initiatives have been implemented; including sustainability focussed degree programmes, many linked to sustainability operational developments in the university. Some international universities have sustainability-focussed schools, for example, the School of Sustainability at Arizona State University, and institutes (University of Gloucestershire). Also, there are consortia of universities planning and working together to strategise how to deliver sustainability education, for example, the South Carolina Sustainable Universities Initiative.

At a global scale, the Institute of Advanced Studies of the United Nations University (UNU) is proposing a worldwide system of Regional Centres of Expertise (RCEs) to deliver education for sustainable development to regional communities, each of which would comprise a local network of existing formal, non-formal and informal

¹² Wells, H.G. 1920. *The Outline of History*. Garden City, NY: Garden City Publishing Co., Inc.

educational organisations and establishments. International universities are taking a lead role in this project, for example Newcastle University with its Education for Sustainable Development project.

These developments suggest that in some international universities there has been effective collaboration between hierarchical and distributed leaders for sustainability, leading to the implementation of substantive learning for sustainability initiatives. Indeed, the increasing volume of literature this decade, exploring aspects of education-for-sustainability is evidence of a growing intellectual understanding that educational programmes need re-orientation if students are to develop the skills and resilience that will be needed to live in a rapidly changing world. Leadership is key to enabling appropriate, meaningful and effective development of education-for-sustainability pedagogies to proceed as quickly as possible.

Varied initiatives that focus on the practice of teaching for sustainability in Higher Education are described in collections of case studies, for example in *Teaching Sustainability at Universities – Towards curriculum greening*, edited by Walter Leal Filho (2002a). In these publications (Filho, 2000; 2002a, 2002b; Filho and Carpenter, 2006) case studies are drawn from a wide range of countries, including Latvia, The Netherlands, Spain, and countries previously mentioned and until *Sustainability in the Australasian Context*, (Filho and Carpenter, 2006) New Zealand was notable by its absence. In this latter volume, Hewson and O'Brien, et al. (2006) describe two environmental projects; a stream project from Canterbury University and an operational management initiative from Christchurch Polytechnic Institute of Technology. Links to teaching programmes are mentioned but not elaborated.

In *Sustainability on Campus – Stories and Strategies for Change*, Bartlett and Chase (2004:1) collect a wide range of narratives to demonstrate the “unfolding of institutional transformation as our nation [the United States] begins to rethink how to live sustainably and in closer harmony with the natural world”. Some narratives describe strategies used for curriculum development, others describe developing opportunities to link research and teaching or engagement with their wider community. Most refer to corresponding university operational practices for sustainability.

Increasingly, the latter half of this decade has seen more publications describing successful case studies of new university initiatives, for example, *Inside and Out: Universities and Education for Sustainable Development*, edited by Forrant and Silka (2006). This book offers a collection of papers by authors implementing, in differing ways, learning for sustainability initiatives in their American universities. The contributors describe learning groups, convergence of fields of study and increasing levels of collaboration of academics across disciplinary lines but leadership remains implicit in the descriptions.

In *Planet U – Sustaining the World, Reinventing the University*, M’Gonigle and Starke (2006) highlight the experience of one campus, at the University of Victoria in Canada, as members of the university community became involved in debating the role of the university in addressing global sustainability issues, suggesting this should be through active learning for creative solutions to current and future problems. The vital role of networks and collaborative vision underpins much of the discussion and examination of initiatives across Europe and North America and the role of change agents. Leadership support for initiatives remains implicit until local leadership for initiatives is mentioned, albeit briefly.

However, in *Degrees that Matter – Climate Change and the University*, Rappaport and Creighton (2007) do discuss the role of decision makers on campus. They argue that “understanding the types of actors on campus and the decisions they are likely to be engaged in” will assist climate action advocates to seek buy-in for teaching and researching issues of climate change (ibid.:74).

It is well understood by educators, and others, that teaching and learning transitions do not happen in a vacuum, rather they develop as a result of individual responses to influences, either internal or external to the university (Chapter Five, section 5.4; Chapter Six, section 6.3). Those international academics who participated in my research are the equivalent of the individual ‘distributed’ university leaders for sustainability, as defined in Chapter 6. They are examples of leaders who successfully influence and progress learning initiatives for sustainability, by side-stepping or overcoming the institutional and cultural challenges to change within a university.

Corcoran and Wals (2004) argue that pathways towards sustainability in universities are unlikely to develop without friction, controversy, and conflict, in a post-modern world. The list of challenges to collaboration and learning for changing times is extensive and also specific to groups and particular disciplines, within their institution, as noted by Velazquez et al. (2005).

Analysis of the responses to the question asking what challenges, if any, were encountered by research participants, reveals that challenges and barriers are the same or very similar, in all countries and that they are the same as recorded in the literature. One notable difference was the references by New Zealand academics to the lack of a government sustainability vision and policy framework that could be referred to when seeking support for new initiatives (Table 3, Chapter Five, 5.3). In contrast, international participants acknowledge that the influence and expectations of their government sustainability policies provide leverage and opportunities for university leaders for sustainability to progress their initiatives

Despite increasing numbers of government level policies, progress in many international universities is slow (Blewitt and Cullingford, 2004; Clugston and Calder, 1999; Sterling and Thomas, 2006), even in universities that have established some initial sustainability learning initiatives. According to my research participants, most university personnel prefer to carry on with a ‘business as usual’ approach, responding to external criticisms by claiming that there are challenges and barriers that prevent them from making institutional, pedagogical and cultural changes that will enable learning for re-orienting towards a more sustainable future.

So, what are these barriers, and are the barriers in Aotearoa New Zealand so different to those in other countries that they provide an underlying reason for our universities failing to meet generic and specific challenges to integrating sustainability learning and action into their programmes?

These challenges and barriers to change (Table 6, page 179) are grouped into themes, acknowledging the complexity of the interactions between the groupings. Some challenges have a political dimension, driven by politics and policies both internal

and external to the university. Other problems are a direct result of the institutional arrangements, or the predominance of disciplinary silos, or the culture of those working within the university, including their attitude to change and willingness to extend their individual professional learning.

I understand that individual schools, departments and faculties within the university will have challenges specific to their internal culture so focus on more generic examples of issues that ‘leaders for sustainability’ have to contend with when implementing sustainability learning initiatives. A detailed exploration of all aspects of the challenges to sustainability initiatives in universities, even one specific university, could be a thesis in itself.

My theoretical model potentially provides a useful frame, or maybe some new spectacles, through which to read the following chapter and consider my findings, discussed in relation to the relevant literature. By keeping this active, dendritic framework in mind, readers may gain further insights into how they too may engage with learning for sustainability in the university sector.

In this chapter I discuss, in relation to my research findings, why there is a need for re-orientation of both how and what we teach, within and across university disciplines, and the role of student contributions and governance, management and policies within the university in enabling those changes. There *are* challenges to changing current university practices, and these challenges are discussed, alongside the literature addressing changes in education and the educational role of universities in learning for sustainability, building further on the literature reviewed in Chapter Three.

7.2 The educational role of universities, for sustainability

According to Dresner (2002), Fien and Tilbury (2001), Orr (1992), Sterling (2001) and many other academic contributors, education is critical, indeed it is the most vital tool for enabling the creation of a rational society that understands *why* there is a need for changes in social behaviours and furthermore *how* individuals and organisations can plan and undertake changes. Enabling people to engage in solving

sustainability issues becomes less of a problem if people understand that the need to maintain a world that will be habitable for future generations is more important or desirable than individual greed of wants over needs (Dresner, 2002). What then is the role of the university in educating current and future generations of learners?

The history of the university's educational role, from religious antecedents to the present university of the twenty-first century is well documented by authors, many of whom argue that it is time for the university to redesign the way it both educates and operates. Readings (1996) discusses the implications of change from the university previously educating for 'culture', to the present, where university, and government discourse is currently in terms of 'excellence'. He suggests that this reflects a change in the function of the university, leading to the fragmented production of knowledge that matters less and less, rather than educating for a shared culture where knowledge is "a conversation among a community rather than [as] a simple accumulation of facts" (ibid.:5). His argument is that there is now opportunity for the university to create a new sense of community, a new model of thinking together and collaborating to fulfil obligations to educate itself and others in a new way.

Readings rightly contends that the university can be "a place where the impossibility of [such] models can be thought – practically thought, rather than thought under ideal conditions" (ibid.:20), and that the university can be the site for changing pedagogical, practical and theoretical thinking to better prepare current and future generations for adaptation to a rapidly changing world. In a century where society is influenced and challenged continuously by increasing globalisation, dislocating social changes and increasing environmental degradation, all higher education institutions need to question what teaching and learning approaches should be provided for their students and how to move from transmission models to more participatory engagement by students.

Participants in this research project all referred to the tension between mere knowledge transmission and teaching for transformation in the university, with one interviewee succinctly stating:

Knowing all the "is's" does not usually lead to "oughts" and changing pedagogical practices. [I-18]

The importance of learner-centred teaching is increasingly explored by educational researchers, including Biggs (1999), Brodie et al. (2002), Nunan et al. (2000), Trigwell and Shale (2004) and Weimer (2003) across a range of disciplines and contexts. All support the value of teaching methods that focus on student-learning processes. Educators and researchers involved in teaching and learning for sustainability recognise that information ‘about’ (an example of first-order learning) does not necessarily lead to transitions to more sustainable values or practices, leading to an increasing call for focusing on the need for deeper learning, beyond knowledge and awareness. Sterling (2001) notes that students need second-order learning involving critical reflection, as well as deeper third-order learning that enables transformative conceptualisation of how we can redesign societal and institutional processes, to meet the challenges in this third millennium.

One problem is the current teacher-focused pedagogy of many university teachers, still focused on imparting content, rather than facilitating the development of thinking skills as explained:

They want to get students through the programme so they get the graduate knowledge of that programme, not necessarily the added [thinking skills] that might be more useful to them. [I-8]

All those academics who participated in this research referred in some way to the need for academics to be involved in collaborative learning, with their students, for moving the university towards a new sustainability paradigm. When discussing the student learning outcomes from current sustainability programmes, one research participant reflects the attitude of all participants when commenting:

We ought to have a set of common objectives and themes [for sustainability] across the university at undergraduate level that are stitched into the interdisciplinary thinking of each of the faculties [but] there’s no administrative drive to achieve that goal. [I-5]

In *Realizing the University in an Age of Supercomplexity* Ronald Barnett (2000a) contends that the university, as an institution, has to consider its role and responsibility, in contemporary times. Past and current human practices have increasingly impacted negatively on ecological systems, social equity and on the rate of global climate change (Stern, 2006) and therefore I suggest that this is the decade

in which universities should be examining how their teaching and learning practices contribute to the current non-sustainable paradigm.

With the rapidly increasing technological means for obtaining ‘information’ there appears to be, in some sectors of society, confusion between information and knowledge. When commenting on this confusion, Wenger et al. (2002) use health system examples, pointing out that someone with a brain tumour would not wish to be operated on by a surgeon who has read and could re-iterate all the information about the brain but who had not accumulated, through engagement and practice, the appropriate experience. Information and experience are part of knowledge construction and McDermott (1999) explains how the knowledge of experts is an accumulation of experience – a kind of ‘residue’ of actions, thinking and conversations – that remains a dynamic part of their ongoing experience.

Historically, western knowledge tended to be ‘held’ and cached within universities and institutions, divulged as it suited those with access to such knowledge for self-promotion in terms of improving prestige or positions of power or for a genuine desire to share ‘enlightenment’ for perceived public good. In relation to ‘knowledge’, the issue for future sustainability is not the now global access to information, but the role of discoverers, holders and creators of knowledge in choosing how information and knowledge are used, whether for public good or, at the other extreme, withheld for improving prestige, power or economic advantages, as has happened with some corporate funded research. In relation to the university, and presuming that creators of knowledge may be seen as ‘leaders’ in their fields of interest, then university leadership that connects to, engages and influences these scholars in *using* that knowledge for student learning may accelerate transitions to appropriate sustainability teaching pedagogies.

Currently, in response to widely articulated societal concern about sustainability issues there are opportunities for trusted university ‘sustainability leaders’ to engage with and influence university teachers to collaborate and learn together to make this happen. Research participants explained (Chapter Five) that a sustainability vision, or strategy or agenda was important for providing impetus and credibility to

designing sustainability learning initiatives. In universities with a designated sustainability coordinator, director or programme leader, the sustainability meetings, forums and new course design initiatives are seen as important and part of the mainstream teaching and learning focus.

The merits of having named sustainability advocates, leaders and programmes are clear. When sustainability champions connect and collaborate with distributed and supportive hierarchical leaders to design programmes with a sustainability focus (or integrated components) then student learning for the twenty-first century progresses from ‘business as usual’ to a more resilient set of learning skills to meet predicted environmental and social challenges. The understandings that arise from the use of the language of sustainability become an integral part of the collage of knowledge that contributes to the intellectual breadth of the academy, supporting the focus on building new knowledge, in particular for a more sustainable future.

7.2.1 The contribution of appropriate teaching and learning pedagogies

Given the ‘supercomplexity’ of the world, Barnett (2000a) argues that the university has a critical responsibility, in contemporary times, to prepare students for the interlinked and varied layers of complexity, where multiplying, shifting and rival frameworks of knowledge produce a sense of unease that students need to learn to cope with. Barnett suggests that in spite of the university being “a site of competing discourses” (ibid.:80) it still has a responsibility to maintain a values background, to enable students to develop their values in the face of many different frameworks being thrust in front of them.

For decades, traditional teaching in universities was based on the premise that filling the students with knowledge, as held by the intellectuals transmitting the content, and coupled with occasional opportunities to debate and critique that knowledge would be enough education for life. There are many reasons that such teaching pedagogies are no longer adequate for living in the twenty-first century, as is clearly explained by many leading researchers and authors, including Filho (2002), Palmer (1998) Sterling (2002) and Tilbury (2005). These reasons include changing student profiles and different student expectations, changing teaching practices and increasingly available access to and use of new technologies for both communication and student accessing of content.

Current research into teaching and learning pedagogies is providing increasing evidence that transmissive educational processes fail to adequately engage students in learning how to collaborate and explore creative approaches to problems. Nor do they empower individuals to make informed and socially responsible behaviour changes. However, there is an increasing body of evidence that participatory, inquiry and learning centred approaches do. Questions need to be asked, encouraging students to critique their views, to reflect on them and to challenge consumptive, modernistic views that continue to lead society towards a non-sustainable future. The post-modern concern that the diversity and needs of a variety of communities should be valued and understood underscores the premise that learning should encompass the development of skills, values and responsibilities in order to develop a critical understanding of our culture.

Participants taking part in my research referred to the continuing university focus on courses and programmes that are perceived to meet the narrow, disciplinary based economic needs of governments, rather than meeting the needs for inter-disciplinary and broader thinking skills for a sustainable future. For example:

We have heard we are producing people who are too narrowly focused for the world. [NZ-1]

The traditional lecture-dominated teaching process results in under-graduate students having surface learning of already known and available facts, partly because lectures lack opportunities for engaging in deeper learning processes that encourage new ways of linking information for better understanding the complexity of our world. Time for critical reflection, appropriate learning spaces and collaborative learner-centred learning is needed for transformation of knowledge in an ecological, interconnected way. An interviewee suggested teaching and learning committees (where they exist) should be asking:

How does a curriculum fit together as a good educational experience for a well conceived future need, future in the sense of what the employers want, and what society needs? [I-9]

Seller (1997) considers that models of education should be based on communication and dialogue, to enable sustainability learning and Frielick (2004) proposes an ecological model to understand the complexity of processes and concepts in

teaching, basing his hypotheses on work and research in universities. He suggests that teachers need a deeper understanding of how teaching enables student learning, not through transfer of information, but through transformative learning processes which in turn require academics to make epistemological changes to the way they engage with and teach their students.

Transformative learning (Sterling, 2001) is considered essential for building confidence and capacity for a major change in cultural paradigm, from unsustainable societal practices to more sustainable actions. Sterling discusses four main functions of education systems: those of socialisation, vocational, liberal and transformative functions, concluding that both the liberal function and transformative functions are needed to develop individual potential, to encourage change for a fairer sustainable society.

Analysis of the interviewee responses to the research question asking about learning outcomes in sustainability learning programmes revealed that participants were aware of what should be in the learning outcomes, even if the language formally used did not explicitly state these features, but implied them in the learning outcome descriptors. These learning outcomes descriptors included most of the learner-centred teaching pedagogies that encourage participative and constructive learning opportunities, including collaborative, inquiry-learning, experiential and action competence approaches that lie at the heart of transformative learning.

Research participants discussed the value of students and staff having greater exposure to sustainability learning, with one interviewee describing how:

There is some pilot testing of sustainability learning as a learning outcome for undergraduate students. [I-7]

My findings are that participants involved in sustainability programmes are very supportive of learning pedagogies involving collaborative projects, field work and experiences obtained through internships. As explained by an international participant:

Field experience is well valued, or working for an NGO, or even government agencies. [I-17]

There are some university teachers that use learner-centred approaches, especially in programmes that have experiential components. Unfortunately the majority of university students still experience transmissive teaching techniques, rather than experiencing opportunities to build the learning and communication skills that are needed for building individual capacity for change.

A research participant describes differences between student and staff expectations of what was useful learning:

The students loved getting people who worked in the real world but I have some staff, [mainly] young ones who prefer to give the students another ten papers to read and I've got staff who should probably do less teaching and complain: "If I don't teach this lecture these students will be deprived". [NZ-2]

Until all teachers make a commitment to integrate some of these transformative learning opportunities into appropriate areas of their teaching programmes, students will lack adequate preparation for solving many of their future challenges. Moreover, staff are failing to deliver the 'best' for their students, and themselves, as life-long learners, if they do not engage in pedagogies that enable transformative learning for the twenty-first century.

Research institutes and centres into education-for-sustainability have been established in a number of countries, for example the Australian Research Institute in Education for Sustainability (ARIES) and in the United Kingdom - the Centre for Research in Education and the Environment (CREE). These research centres are producing increasing evidence of the successes of transformative teaching and learning pedagogies that empower learners to build their individual and community capacity for solving sustainability challenges. Teachers do not have to be 'experts' in sustainability, but they do need to use appropriate teaching pedagogies and discuss issues within a sustainability context in order to reach the goals of education-for-sustainability.

Trigwell and Shale (2004) explore the scholarship of teaching, agreeing with the Carnegie Academy for the Scholarship of Teaching and Learning view 'that scholarship of teaching is fundamentally an aspect of the activity of teaching'

(ibid.:525). They describe a ‘scholarship of teaching’ model that “uses pedagogic resonance, a concept that links teacher knowledge and student learning” (ibid.:524) and focus on teaching as an act, an activity carried out in response to previous practice and the results of research inquiry. The focus needs to be not only on the teacher content knowledge but more importantly should be asking “how knowledge is used in action with students and which elements of that knowledge lead to learning” (ibid.:528).

With reference to the many recent contributions to the research on teaching, scholarly teaching and scholarship of teaching, Trigwell and Shale claim: “In our view, it is axiomatic that the most effective use of the concept of teaching is that which results in the most powerful student learning” (ibid.:527). This focus on student learning as a key ingredient for education, especially when involving collaborative learning between students and their teacher is advocated by both researchers and teachers involved in learning for sustainability, including Bolstad et al. (2004) and Eames et al. (2005), as discussed in the Literature Review, Chapter Three, section 3.

One research participant who had faced considerable difficulties in gaining acceptance for involving students more directly in the learning and teaching process explained:

Academic personalities ... often very fixed and unwilling to consider alternative ways of doing things, including shifting their thinking – [because] most were taught and trained in the western knowledge paradigm. [I-18]

Given academic conservatism, adherence to knowledge as power, a reluctance to change teaching methods (especially given time constraints, institutional structures and lack of collegial support) teachers face many challenges when re-orientating pedagogies to enable learning for sustainability within the university setting. In addition, there are problems of both time for and the availability of professional development opportunities for learning how to re-orient teaching pedagogies, including a willingness to invest personally in learning more about sustainability in an inter-disciplinary context.

Despite such challenges, globally there are hundreds of recorded examples of university academics who have made changes in their teaching to encourage holistic, transformative learning. The University Leaders for a Sustainable Future (ULSF) website lists a steadily growing number of university programmes and courses that are being taught in and across a range of disciplines ‘for’ learning how to be part of the solutions to rapidly accelerating twenty-first century challenges.

In Aotearoa New Zealand, there are individual academics who have responded to changing student expectations, research findings and personal concern to re-orient some aspects of their teaching to provide improved long-term student learning outcomes. However, it is apparent from discussions with university teaching and learning departments that such innovators are still a minority.

From my experience working with primary and secondary school teachers, as a facilitator for teacher learning of appropriate student centred pedagogies for educating for sustainability, I note that the context in which this learning occurs is all important. Students need to be engaged in authentic learning about real issues in order for powerful learning to happen. Education-for-sustainability provides an opportunity for aligning teaching practice with a new vision for collaborative and learner-centred education. What is needed now is transformative leadership that encourages academics to see the advantages of valuing learning-centred teaching over the transmission of historic content knowledge, or as Trigwell and Shale (2004:534) suggest “creating situations in which students learn, rather than a scholarly energy which creates situations in which teachers instruct”.

Trigwell and Shale (2004) point out that well-planned educational experiences “help all students to develop as independent thinkers” (ibid.: 534) and share their concern that teaching in universities continues to focus primarily on the transmission of knowledge by the expert, rather than engaging with learning how to use new appropriate teaching pedagogies that empower student learning for the future.

Learning for the future is as important for academics as it is for their students, and there are increasing educational expectations that authentic learning opportunities

will be provided, as part of a transition towards learning for a new, challenging future (Stir, 2006; Tilbury, 2006). I argue that teachers need to collaborate, to develop learner-focused teaching practices and that they should be exploring that learning within a framework of sustainability, as it relates to their field of study and inter-relates to other disciplines. There is a role for university leadership in fostering, resourcing and providing time allocations for learning how to implement new teaching pedagogies for sustainability. In addition, the promotional reward structure needs to be addressed.

Within the university, decisions are made according to the ethics and values of individuals and organisations both within and outside the academy, as noted by participants and discussed in Chapter Six. Academics note that the promotional systems of most universities encourage academic publications over sharing new understandings and knowledge with their wider community, leading to an interviewee commenting, in relation to lack of time for community participation:

We are trying to publish so that we can keep our jobs. [I-3]

This emphasis on what is frequently referred to by academic participants as ‘publish or perish’ may effectively delay individual ability to take time for learning how to reorient teaching and learning pedagogies.

The concepts of universities as ‘learning communities’ (Shapiro and Levine, 1999), ‘communities of practice’ (Wenger, 1998) and ‘learning organisations’ (Senge, 1990) imply that all levels of the university can learn together for sustainability, a collaboration of learning that should involve all sectors in developing a shared vision for why they are learning. Presuming this shared vision is realised through enabling student and staff attributes and competencies for living in a challenging future, this would have implications for the core courses and programmes offered at universities, as well as implications for developing best practice sustainability teaching pedagogy, supported by sustainable operational management systems in the facilities and administrative sectors.

Students and scholars (Nunan et al., 2000; Clark, 1987) question the value of impersonal transmissive teaching pedagogies, compared to transformative dialogue,

collaborative and experiential learning opportunities that enable deeper learning. Research participants comment on the fact that academics may acknowledge the need for change, but don't want to change their practices, as discussed in Chapter Five. For example when referring to sustainability focused courses this interviewee points out that:

Some people see that they have educational value but in a kind of detached way. They don't want to get involved, to change how they teach. [NZ-7]

An overseas interviewee discusses the need for change by linking university education to the increasing understanding of sustainability in society, in the following way:

The university needs to build capacity for sustainability thinking – in faculty, leadership and through the availability of courses, etc. We need a new generation of public servants and professionals who think differently, if we are to survive. [I-18]

The lack of opportunities for good learning exchanges is another problem, as most university seminars focus on details and in narrow arenas, reflecting the narrow focus of disciplinary based research. There is a lack of seminars on trans-disciplinary topics with good time for conversations built into the time given for those, according to three New Zealand participants, from three different universities.

One key challenge is how to build more professional development capacity in order to encourage academic engagement with collaborative learning and teaching for sustainability, within and across disciplines. However, the challenge to re-orient their teaching to include the fundamental learning models required for rapidly changing externalities can simply be ignored and furthermore, there are limited opportunities for re-training in teaching pedagogies more suited to learning *for* a sustainability paradigm.

The lack of pre-service school teacher training for education-for-sustainability is described as critical by Law (2003), as discussed in Chapter Three. Given there are very limited opportunities, in Aotearoa New Zealand, for learning about the pedagogies most suitable for learning for sustainability, I am asking: where is the university leadership that will collaborate and strategise to provide appropriate professional development learning opportunities for education-for-sustainability in all teacher training courses?

Furthermore, where is the current leadership support for increasing professional development opportunities for all university teachers? Both hierarchical and distributed individual leaders for sustainability have important roles to play in advocating for and becoming part of the learning communities that support new pedagogical teaching and learning practices for sustainability outcomes.

7.2.2 *Eco-literacy*

Universities offer an ever increasing range and number of educational programmes, as is evidenced by examination of university calendars. Most universities offer ecological, biological, development and similar ‘systems’ programmes, providing opportunities for students to understand the complexity and inter-relatedness of natural, social and artificial information systems.

However, only a small minority of the student population enrol in these programmes and most graduates emerge from university to engage in professional and technical positions in society, with little or no experience of systems-thinking, partly because of their limited life experiences. They have little appreciation of how humans are ultimately dependent on healthy well-functioning ecosystems, nor that ecological and social systems are intricately linked. There are others who have an affinity for a sense of wonder of the living world, described by E.O. Wilson (1984) as ‘biophilia’, referring to humankind’s love of living things, our innate connection with nature. It is more likely that these students are aware of ecological linkages, but that is not always the case.

In effect, few students engage with an ecological paradigm (Capra, 1996, Orr, 1992; Sterling, 2001). This ecological paradigm, a component of the post-modern world view (as discussed in Chapter Three, section 3.2.1) involves a shift away from the modern paradigm of ‘man conquers the world’ to understanding how deeply interconnected and complex are our planet’s biotic and non-living systems. Orr (1992) is credited with coining the term ‘ecological literacy’ and ecological literacy is defined by Capra (1996:289) as “understanding the principles of organisation of ecological communities (ecosystems) and using those principles for creating sustainable human communities”. Capra contends that teaching ecological knowledge will be the most important role of education in the first decade of the

twenty-first century, a reasonable contention that implicitly acknowledges that the ‘bottom line’ is environmental and ecological sustainability.

Orr (1992:134) comments that “Ecology has been isolated within biology departments as though it had little or nothing to do with the social sciences, the humanities, or the professions” and argues that one of the results is a “pervasive anthropocentrism” leading to an assumption that nature and its resources are infinite. Such an assumption is supported daily by constant exhortations through different media to buy more goods or do more things, compared to fewer coordinated messages and conspicuous calls to reflect on the impacts of ‘more’ on a planet with mainly finite resources. This is in contrast to increasing societal concern expressed in a rising number of academic publications, books and popular media, for example the special investigation “Earth Audit”, in *New Scientist* magazine (Cohen, 2007) claiming looming shortages of mineral resources.

Research participants suggested that students were increasingly aware of environmental and social issues and noted the challenges of external influences. This participant comment reflects the majority view of the interviewees, that:

They see through the gap, the growing gap between the rhetoric and the reality in our society. A lot is written but there’s not much evidence [to the students] that society is really trying to practice it [sustainability]. [I-10]

Furthermore, in relation to learning about sustainability issues, an interviewee explained:

Studying sustainability issues should be positive and I’ve tried to work my environmental education so that it has positive as well as negative messages. The last thing I want to do is to cause pessimism in the worldview of developing minds. [NZ-7]

According to Orr (1992:94) “The study of environmental problems [alone] is an exercise in despair unless it is regarded as only a preface to the study, design and implementation of solutions”. What is needed are the learning skills that enable critique of current practice, reflection of personal values and action competence to plan and make changes that are more likely to lead to long-term changes in behaviour. In his book *Sustainable Education: Re-visioning Learning and Change*, Sterling (2001:55) explores the possibilities of using the understanding of ecological

sustainability coupled with whole systems thinking as a base for “envisioning an ecological education paradigm” that would encourage the transformative learning needed for creating a sustainable future.

Universities are in a unique position to evaluate their teaching and learning programmes and redesign them to ensure basic eco-literacy (integral to sustainability-literacy) and appropriate learning skills are part of the learning experience for every student. Within the university there are teachers of ecology, biology, psychology and geography who are teaching and researching in ‘topics’ that include some aspects of ecological understanding, or about core features of sustainable ecosystems. According to a research participant, with reference to graduate programmes for sustainability:

They have a discipline, so they’re an economist or they’re a lawyer, they’re something and they want to be able to deliver sustainability outcomes and it means different things to different people in different contexts. The programme has to be very flexible [yet include basic understanding]. [I-5]

What is not apparent from the research or literature is the explicit presence of effective leadership for establishing collaborative communities of learning, to learn from each other and collaborate for transitions to wider inclusions of eco-literacy as a component of core sustainability learning in all programmes at university level.

The role of university leaders in articulating this need and supporting the strategies leading to learning for transformation is critical, if future generations are to thank current teachers, not blame them for their level of preparedness to live in a rapidly changing twenty-first century.

7.2.3 *The role of disciplinary knowledge*

Most students currently attending universities face a future of at least six more decades and might be expected to have a profound interest in how their learning will help them achieve their future goals and aspirations. Will the information they access or are ‘given’ be adequate, appropriate or actually instrumental to their future achievements? Or, as discussed by a number of commentators (Sterling, 2001; Cortese, 2003b; Tilbury, 2005), is it for the ‘benefit’ of the students, to be ‘good’

contributors to society, following the will of others, repeating the mistakes of the last century well into the twenty first century?

The contemporary university demonstrates, through increasing variety and numbers of courses, programmes and degrees, an increasing tendency to break knowledge into even smaller discrete pieces, as a quick look through university calendars since the 1990s shows. Trowler and Knight (1999) argue that knowledge is now commodified, capable of being delivered as a product in module-sized chunks so that a learner can easily achieve a measurable learning outcome, easily assessed and I suggest readily forgotten unless it is an integral part of contextual experience.

In addition, the specialisation of disciplinary language and modes of specialist teaching have supported an academic culture of protective individualism, with surface collegiality being the norm, rather than sincere collaboration for innovation in teaching and learning (Balaton scholar, personal communication, September 18, 2006). This restricts the ability of many academics to address both their personal and their students' sustainability knowledge.

The effect of such specialisation leads Clark (1987:273) to suggest that "if knowledge is power then new knowledge is new power, expanded knowledge is expanded power, and fragmented knowledge is fragmented power". If this is the case, then pursuit of fragmented power may effectively hinder academia's progress towards a post-modern sustainability paradigm. In this century, university learning only within disciplines is essentially contributing to more 'unsustainable education' and all learners deserve more.

Orr (1992:138) is concerned that "knowledge has become increasingly disconnected from the person" and students' formal learning experience lies within what Whitehead (1929) called "the fatal disconnection of subjects" (cited in Orr, 1992). Orr advocates that the learning environment be restructured, to help students overcome the "split between intellect and experience". As commented on earlier, learning 'about' something may do little for re-imagining for an alternative future. However, using transformative teaching approaches within disciplines, within the

context of sustainability, are more likely to enable transformative responses, depending on the nature of the learning experience (Sterling, 2001, 2004).

Discussions with research participants reveal a range of issues associated with disciplinary arrangements, including comments related to the lack of understanding of the many opportunities for inter-disciplinary or trans-disciplinary research, the lack of collaborative research within some silos and the lack of support by managers and leaders within the discipline for projects that require more time to plan for and implement. This bounded situation limits the opportunities for innovative research aimed at solving problems by designing new products or establishing new modes of practice that do not result in increasingly unsustainable practices and further loss of physical and biological resources.

Research participants' comments include a range of insights into the protection, by academics, of the focus of their disciplinary teaching, for example:

People are quite willing to change some of the (higher order) concepts, but they're not going to change the current stuff, down here, so how do we actually get different sets of actions resulting from different ways of seeing the world to here – a deeper level. That's the ultimate challenge really, and sustainability education is actually talking about different sets of beliefs at a fairly deep, deep level. [I-13]

There is strong defence by university teachers using specialised methods and knowledge bases within specific disciplines that 'academic freedom' and 'scientific rigour', amongst other things, are more important than consideration of the needs of the wider community. While such beliefs may be strongly defended, that does not make them any less 'value-free' than a differing argument that what is taught in universities should be relevant as well as challenging and 'up to date'. Nor does anyone claim that content knowledge is not needed, the concern is whether the relationship between learning skills and content is properly balanced, even weighted, given the challenges society faces.

Participants in this thesis research commented on the long time frames and laborious processes of 'approving' new courses and cross-faculty curricula degrees, mentioning the barriers of academic patch-protection and competition for course

‘content’. For example, in relation to integrating sustainability concepts, an international participant describes the competition in this way:

There is a history of fighting over the words being used, environment related words. Can you imagine - both Engineering and Economics fought over the words ‘environmental management’. Both believe they should deliver core [sustainability] education courses, and other disciplines are peripheral. [I-5]

The dilemma appears to be that disciplinary segregation, that in itself makes it easier to manage specialist knowledge needs to be acknowledged for what it really is, appropriate for knowledge and technical specialisation, rather than for education for the whole person, unless integrated with more holistic, contextual learning experiences. There are many disciplines including history, philosophy, social development, gender studies, religious studies and similar disciplines that have much to offer to discussions about learning within the university, drawing from their knowledge and understanding of what happened when other societies and cultures engaged in changing paradigms of ‘development’.

Kreber (2002:9) reminds us that teaching excellence “requires sound knowledge of one’s discipline, as well as a good understanding of how to help students grow within, and perhaps even beyond the discipline. Also, excellent teachers are seen as those who know how to motivate their students, how to convey concepts and how to help students overcome difficulties in their learning”. Excellence is “predicated on incremental movements of tried and true methods”, according to Smith (2006:2). However, it is innovation as a result of new ways of linking our thinking that will be needed to cope with the rapidly increasing perceived and actual crises now facing humankind.

I suggest that all disciplines could contribute insights into how universities can enable and support students to learn beyond the ‘what’ to why we need to know and moreover, how we can use that knowledge for creating a more sustainable future. Varied individual initiatives, ranging from Accounting Education for Sustainability (Cowton, 2004), Social Policy and Sustainable Development (Huby, 2004) and including Sustainable Community Landscapes (Cahill and Chalker-Scott, 2002), and many more, are described in the literature collections edited by Bartlett and Chase (2004), Blewitt and Cullingford (2004), Filho (2000, 2002a, 2002b) and Filho and Carpenter (2006).

Most case studies in the literature are individual isolated initiatives. As discussed in Chapter Four, I found no evidence from my research that isolated initiatives by themselves build enough capacity to enable authentic paradigm change for sustainability across the university. At some point, collaborative planning is needed, as described by participants:

People [from other departments] bring in all sorts of ideas, there are all sorts of influences, so it is about the people and their wish to make it work, the teaching for sustainability. [NZ-3]

International participants describe examples of effective and successful collaboration, despite the initial procedural difficulties and challenges of establishing different group dynamics when working together across varied disciplines.

what everyone does share is their liking to tackle a problem from many different angles ... but it can also make it messy. [I-17]

Challenges were overcome as good relationships and networks were established and leadership support helped drive cross-faculty decisions. The importance of leadership is noted by all participants involved in inter-disciplinary courses, for example:

It is very hard to institutionalise trans-disciplinary courses unless you have the protection and support of senior management. [I-20]

In the literature there are descriptors of wider ranging initiatives that have developed during the last decade. Collaboration and leadership for sustainability is well described in *The Ponderosa Project: Infusing Sustainability in the Curriculum* (Chase and Rowland, 2004), an example of a wide range of faculty at Northern Arizona University integrating issues of environmental sustainability into 120 courses across the curriculum, from areas as varied as music, nursing, political science and art history.

These examples support my research findings and resonate with my suggestion that connected transformative university leadership (as discussed in Chapter Six) is essential for leading and supporting transitions to education-for-sustainability, from our current learning paradigm, an essentially fragmented ‘unsustainable education’ to the sustainable education required for social cohesion in the twenty-first century.

7.2.4 Core Learning Requirements

Sustainability-literacy, eco-literacy, citizenship and social justice, ethics and personal responsibility are all keys to enabling university students to better understand the complexity of life and our responsibilities to the world we all share. Focusing on desired graduate attributes is one way of providing opportunities for integrating needed competencies into student learning outcomes, and this is being explored in some universities. In response to a high level briefing at one university:

The Deputy Vice Chancellor is undertaking some pilot testing of sustainability learning as a learning outcome for undergraduate students. [I-7]

A few decades ago core papers were pre-requisite for many degrees, for example, mathematics (numeracy) and language (literacy) were required as components of some science degrees during the 1960s. More recently, some universities require a core general paper to be completed in all undergraduate degrees, such papers including, for example, learning and writing skills, society, citizenship and values. Given the critical nature of sustainability issues, the proposition that students take a general core paper that addresses some of the base knowledge of the connectedness between the social, ecological and economic world appears a realistic contribution to improving sustainability-literacy. Involving university teachers in professional development, for example creating learning communities for raising knowledge and understanding of the issues facing humanity would provide support and opportunities for sharing of ideas of how to integrate sustainability contexts into their courses, where appropriate. The academic ‘culture’ as a barrier to such a fundamentally sensible idea is discussed further in the next section.

Universities could be considered examples of ‘communities of practice,’ a mosaic of communities where everyone is engaged in either teaching students or supporting (through research and administration) student learning. There are many examples of communities of practice, learning communities and community learning programmes that provide both the learning opportunities and knowledge sought by those people participating in them. In some universities the development of communities of practice, defined in Wenger et al. (2002:4) as “groups of people who share a concern, a set of problems, or a passion about a topic and who deepen their knowledge and

expertise by interacting on an ongoing basis”, are helping to link parts of the organisation together, initially around core knowledge requirements.

Such communities develop their own culture and can, through careful interactions, help transform the larger organisational culture around them (ibid.:194). An example of this is the University of South Carolina initiative where the Medical School and English faculty now have sustainability issues as core learning in their curricula (Jerman et al., 2004).

Educational researchers acknowledge that learning ‘about’ things does not automatically lead to understanding and changes in personal or organisational practice. It is recognised that sufficient, not total ‘knowing about’ is a base from which dialogue, critical thinking, experiential involvement and rational reasoning can build, enabling learners to develop advanced thinking skills that will better equip them to respond to the challenges and opportunities to create their preferred future.

The contemporary role of universities needs further critique, in the light of the needs of student learners facing known and unknown changes. Universities have multiple opportunities for both showing leadership and becoming part of a community of future-thinkers for helping societies, nations and the global community become equipped to adapt to the future. This role should be paramount.

Transformation of the way teaching is carried out and courses are constructed is not simple but it is possible, as demonstrated by an increasing number of case studies from those universities accepting current and future challenges (Bartlett and Chase, 2004; Blewitt and Cullingford, 2004; Filho, 2000, 2002a, 2002b; Filho and Carpenter, 2006; Palmer, 1998, M’Gonigle and Starke, 2006; Rappaport and Creighton, 2007). These case studies demonstrate there are growing numbers of sustainability learning programmes and that connected and collaborative teaching programmes are possible. This is reflected in my research findings, as reported by individual, international participants, themselves examples of distributed sustainability leaders.

Another concern is the difficulty of retaining good teacher-researchers in certain departments that already have limited capacity, because these forward looking and future focused staff can find research work elsewhere in government and business organisations with a sustainability focus.

7.3 Social Culture within the University

7.3.1 University Culture – The Institution

The culture of a particular university is the product of the universal history of the establishment of universities, the development of a particular university in place and time, the nature of the student population it engages with, research and teaching funding opportunities and, amongst other influences, the need for adherence to external statutes and expectations. This culture is reflected to wider society through policies, outreach commitments and descriptors of courses and operational practices, as described on the university website. In addition, observable practices, especially as they impact on society, inform understanding and beliefs about university culture. Interviewees in this research argue that the present business culture of universities presents a barrier for the vital cross-sectoral dialogue that is needed to shift from general awareness of a need, into the realm of actually effecting the changes for student learning for sustainability. If a business model prevails, where students can be compared to ‘products’ when reaching graduation, and a lecturer’s worth is rated according to the number of (usually) specialist papers published in refereed journals, then there is little organisational incentive to look beyond focusing on individual research rather than expending scarce time and energy in learning how to use teaching pedagogies for enabling action for sustainability.

Time and effort is needed for re-designing courses with real-world contexts and using new pedagogical approaches to provide students with the critical thinking and experiential skills they need for leadership in this new century. Learning ‘about’ sustainability can more easily be included in teaching sessions, but learning ‘for’ requires different pedagogical processes and understanding that learning can be co-constructed by learners and teachers.

Results from my research reveal that in Aotearoa New Zealand there is little encouragement for university teachers to collaborate in re-orientating courses to better serve their students for learning for life. Instead, there are external influences and internal challenges to making time to do so. Yet, an increasing body of research indicates that students learn more from their interactions with their ‘surroundings’, especially from the attitudes and behaviours of their peers, parents and teachers as well as inherent responses to their physical environment, than from knowledge content.

University students and staff receive messages daily about the way university facilities operate and note whether future focused thinking is valued, and if there is any collaboration in developing new teaching and learning programmes.

One research participant observed how students and staff are affected:

It is university attitudes re ‘what counts’ - if the focus is on ICT and economics, then that is the underlying message for all [I-6].

When cross-disciplinary dialogue and research is not obvious, and degree programmes lack long-term systemic learning opportunities, then the ‘value’ message is not one of engagement, empowerment and continual learning for a sustainable future. What appears to be totally lacking in many universities, including most of those in Aotearoa New Zealand is a coherent vision about what a focus on economics, ICT, mathematics, science, psychology or developmental geography, to give just a few examples, can contribute to or is ‘for’ in terms of a quality future for current young generations and their children.

The fact that Aotearoa New Zealand universities have only relatively recently established basic initiatives in ‘greening the facilities management’ is evidence that universities are only just starting to effectively engage in the global debate about sustainability. There are increasing research and teaching opportunities for universities, if they use the many advantages of operating as an integrated community across the different divisions of the university, with connectedness and collaboration that models ecological and social sustainability.

Instead, sectors of the university community continue to focus on disparate, different parts of the collage of knowledge, without effective engagement for learning about and researching the connections and interactions needed to build understanding of at least the generic complexity of the sustainability paradigm. A participant observation that brings together three dimensions of the cultural challenges to sustainability initiatives in universities is neatly stated as:

I think academia is most characterised by reductionist thinking, the reductionist structures and the reward systems encourage it.[I-13]

Supported by:

I would say that disciplinary silos (still) exist - to some extent. [I-16]

This comment is reflected and reinforced by many research participants and well supported in the literature, as discussed earlier.

John Ralston Saul (1997:70) in a discussion about the need for universities to “teach the humanist tradition as a central part of their narrowest specializations” suggests that there is a “betrayal by much of higher education of their wider mission”. Saul maintains that the specialised language and focus of universities has effectively become separated from human reality and that the current problem is “to teach students to think and to give them the tools of thought so they can react to the myriad changes, including technological, that will inevitably face them over the next decades” (ibid.:69). The traditional academic language of disciplines and the labels they use also serve to limit thinking and help create barriers to finding those common borders or border crossings through which ideas can be exchanged and collaboration initiated.

Orr (1994:5) suggests that the crisis we all face is one of mind, perception and heart: “the kind of education we need begins with the recognition that the crisis of global ecology is first and foremost a crisis of values, ideas, perspectives and knowledge, which makes it a crisis **of** education, not one **in** education” (emphasis in original).

7.3.2 Academic Culture

In the literature, academics are described as autonomous individuals, protective of their scholarly ‘patches’ of knowledge while involved in surface collegiality and

keen to over-promote their rights of academic freedom, according to Barnett (2000c), Lee et al. (2007) and Readings (1996). According to Lee et al. (2007:6) the dominance of these attributes often both “erodes collegiality in departments and mitigates against the cooperation required for curriculum [as opposed to individual course] reform”.

Transitions towards change are a threat to academics (or any staff) comfortable with their present position in the university, especially calls for altering current teaching pedagogies to focus on the skills and outcomes needed for learning for coping with the complexity of increasing sustainability challenges. The following quote neatly reflects many research participants’ views:

The kind of personality that leads you to succeed in the institution makes it really hard to do anything different. [I-16]

Barnett (2000c:13) discusses the concept of an academic community and whether discourse about level of discord and fracturing within this community is “indicative of a disjunction between the academic world and the wider society”. My research results indicate that universities still lack the significant levels of collaboration and discourse about inter-disciplinary issues that are needed to begin pursuing a sustainability agenda. This contrasts to the developing culture of increasing participation, tolerance and adaptation practices undertaken daily by citizens outside the university.

The image of the ‘traditional academic’ involved in pursuing ever more detailed ‘knowledge’ of what is often already well understood, at the expense of understanding wider issues of life leads authors Barnett (2000c) and Readings (1996) to consider how very disconnected academia can be from the ‘collective consciousness’ of society. Readings comments extensively on the role of academics in the university and points out that those teaching within the institution are expected to be part of the notion of a culture of ‘excellence’, a term he considers has no real meaning, apart from comparing performances in producing knowledge, across the university.

An overseas research participant discusses the widespread university use of the term ‘excellence’ in this way:

I think excellence is kind of an interesting way of getting round the fact that they don’t know what their role is ... a kind of rhetorical strategy. [I–11]

It is important to understand that education-for-sustainability is not an isolated concept but is, along with complementary terminologies, endeavouring to provide a framework or compass for thinking about how we can engage in a process of education that is enabling critical learning for a more sustainable future. Furthermore, it is a concept that is in the process of ‘evolving’ as educational, social and scientific researchers analyse, compare and synthesise the knowledge and understandings emerging from increasing interest in creating a sustainable future.

In the Select Committee on Environmental Audit Fifth Report from the United Kingdom Parliament (2005, paragraph 23) the authors of the report state that:

we have to conclude that what holds back the progress of education in environmental matters is not really a problem with the terminology, (whether it be Sustainable Development, Education for Sustainable Development, Environmental Education or something else), but rather its application, and the fundamental lack of commitment to the basic principle on the part of those with responsibility for promoting and educating us about it.

7.3.3 Student culture

Globally, there are hundreds of university student sustainability groups and many of these groups have strongly influenced the development of new policies for environmental sustainability and the establishment of more sustainable operational management systems within their institution. Some have also influenced and supported individual staff in making transitions towards integrating more education-for-sustainability into courses.

The reasons for student involvement are varied. Students may have moved to university from educational institutions and communities where operational sustainability practices are the norm and most students are aware of, and some already actively engaged with, organisations reflecting societal concerns about the rising rate of sustainability problems.

However, there are many difficulties facing these future-thinking student groups and their communities. Because of the very transitory nature of the student population, their need for involvement in part-time employment and long absences during study recesses and summer holidays, momentum usually has to be re-gained and relationships with administration re-established. Records of previous meetings are often mislaid and prior initiatives unknown or not well understood, often resulting in unnecessary re-invention and expenditure of energy and time (Gecko member, Victoria University of Wellington, personal communication, April 17, 2007).

Despite their concerns, many students find few opportunities for learning more about the complexity of sustainability issues, because neither specific or integrated sustainability courses are available, or they lack the inquiry and collaborative learning skills to effectively engage in deep sustainability learning.

Another issue that is starting to change, for the better, because of the external societal sustainability discourse, is the ‘career’ choice problem that existed prior to this decade. In the past:

Students were not prepared to choose environmental sustainability courses because they do not see concrete careers. [I-7]

Increasingly, international universities are explaining the reasons for including sustainability learning in degrees and publicising the many opportunities for doing so both within separate disciplines or by enrolling in ‘specialist’ sustainability courses.

For example, Monash University in Australia has a very well designed booklet – *Why Study the Environment & Sustainability*¹³ – that was written, under contract, by two post-graduates (Chris Cocklin, personal communication, September 27, 2006). This booklet uses language relevant to the major ‘target audience’ of young students, without losing its appeal for more mature students, especially those undertaking further study in response to actual or perceived needs to understand more about the sustainability context.

¹³ see Monash Environment Institute, Monash University.

The most successful examples of student-driven sustainability achievements are in the area of operational practice and internationally there are increasing examples of inspiring student influence. Many American universities have strong student sustainability initiatives, for example Oregon State University has a Student Sustainability Initiative, supported by student fee contributions and students at Harvard, Berkeley and Stanford universities are legendary with the university operational changes they have driven, proving inspirational to student university groups worldwide.

In Australia, the Australian Student Environment Network (ASEN) involves thousands of students, through their affiliated tertiary, school and community groups, focusing on a wide range of sustainability issues. The annual Students of Sustainability Conference (originally 'Students, Science and Sustainability' in 1991) is held in different states, attracting hundreds of participants each year and leading to advocacy for and student-led implementation of diverse sustainability initiatives within universities.

Some Aotearoa New Zealand universities currently have dedicated and enthusiastic student groups endeavouring to pressure the administrative levels of their university to formulate policies and create systems for sustainable operations. These groups have had variable levels of influence ranging from very little impact to occasional forays into establishing simple recycling schemes. However during the last few years, supported by extensive societal debate and increasing levels of concern about the impacts of unsustainable practices, a few university student groups can claim success with their initial involvement in developing university sustainability policies and encouraging more sustainable student and staff actions. For example the efforts of student groups 'Gecko' at Victoria University of Wellington (VUW) ¹⁴ and 'LEO' at Lincoln University¹⁵ helped influence university leaders to consider the sustainability agenda, leading to sustainable operational management policies.

¹⁴ Gecko – VUW's environmental group <http://union.vuw.ac.nz/union/students-clubs/gecko>

¹⁵ LEO – Lincoln Environmental Organisation: <http://www.lusa.org.nz/leo/LUcommitment.htm>

Previously, due to lack of leadership and commitment, university students were not well supported with efforts to engage in the dialogue and re-orientation of thinking that is needed for altering unsustainable practices. Until recently, educational institutions in Aotearoa New Zealand had a record of mainly non-sustainable operational practices. Consequently students moved seamlessly from little eco-literacy learning and poor operational practices in secondary schools, to tertiary learning in buildings that remain poorly insulated, where waste is not effectively recycled, energy efficiency needs improving and levels of water wastage reduced.

Until very recently photo-copied material was one-sided and too many emails continue to be printed out, rather than filed electronically. The list of unsustainable practices is much longer, and is applicable to many universities around the globe. This sustainability issue applies to all levels of educational institutions but the key point is that universities are expected, by both those within them and wider society, to be leaders in the forefront of using knowledge to pursue a range of improvements for society in general.

University students can play an important role in encouraging the university to become involved in re-inventing its policies, teaching programmes and reward systems to enable better collaborative and trans-disciplinary learning, within a sustainability conceptual framework for guiding future learning. Recently, University of Canterbury Student's Association¹⁶ used the knowledge gained from student summer scholarship work, investigating how the campus could become more sustainable, for a Greening Orientation initiative. This included an 'eco-my-flat' competition and workshops covering sustainability themes of transport, energy and consumption.

Tertiary student demand for change is likely to increase as students enter tertiary institutions from the rapidly growing numbers of Enviroschools and Sustainable Learning programmes in the primary and secondary formal education sectors (see Chapter Two, section 2.4.2). The increase in schools involved in these programmes is leading to improved sustainability practices in more schools, and students will enter university and other tertiary institutions empowered to improve current

¹⁶ UCSA sustainability projects – www.sustain.canterbury.ac.nz

practices and expecting to have opportunities to learn in a socially collaborative and cooperative manner and act in environmentally sustainable ways.

The question arises of how teachers can be expected to facilitate understanding of why and how existing individual, social and organisational practises can successfully be improved if there are no well articulated sustainability policies and management systems that model and enable such improvements in their educational institutions.

It is likely that these students will both expect and request more opportunities for learning that enable them to become actors in making needed transitions to create a more sustainable future. There will be the potential for collaborative student co-learning with academics, and increasing student leadership initiatives for co-constructing sustainability learning programmes. Students will seek entrepreneurial opportunities that, if they have good understanding of ecological systems may lead to real progress in delivering sustainability outcomes, rather than producing more long term problems, through short term fashionable products or behaviours.

7.4 Institutional arrangements

7.4.1 *The university as a corporation*

Universities, as a result of their historical development and the increasing size of their institutional structures, have complex and hierarchial decision-making systems where centralised hierarchical management, academic and operational committees meet to respond to, critique and initiate policy changes. Current university policies reflect both past and more recent social and government expectations and their guiding policies or vision statements express that complexity. There is a plethora of statutes, codes and management demands to be met by staff, in an increasingly complex and changing institutional environment.

The current institutional arrangements of modern universities are primarily the result of their huge expansion during the twentieth century, overlaying a historically very different organisational structure that had changed little in the previous century. This development has delivered increasingly complex disciplinary, academic and managerial hierarchies, in response to both internal and more insistent external drivers.

The university corporate entity appears to have an identity that is perceived to be quite separate from individual teaching and general staff practices. In part, the sheer size of the university results in the separation of functions so that different departments, management groups and research and teaching sectors appear to have no common understanding of what the goals and future strategic directions of the university are. This fragmentation leads to attitudes and behaviours, including competition for resources, that mimic those leading to current unsustainable practices. These behaviours continue to now pose challenges to our sustainable future.

Interviewee statements reflect these apparent ‘barriers’, and the consequent exclusion effects this has. For example, an interviewee explains:

It’s all very much vested in the minority now, the management. You have an academic board at senior level and an academic administration committee of a few people and they make all the decisions. So it’s a kind of almost undemocratisation but at that time it was more democratic I think shall we say. It was more like a general forum and so it was easier to put forward proposals [for sustainability courses] and discuss them and get them accepted.
[NZ - 7]

However, in universities overseas, individual strategies, specific to the university, have led to innovative ways to collaborate with other faculties. For example, as explained by this research participant:

We have a number of joint programmes which we didn’t used to have ...and our interdisciplinary vice president’s office, they picked research themes to focus on and one of them last year became sustainability so that also really helps, so it’s more, real, collaborative research across faculties. [I - 17]

Individual academics, particularly those in science-related and human geography departments may be involved in teaching and research into sustainability issues, however this practice is not reflected across the New Zealand university ‘corporation’, nor the tertiary sector as a whole, according to research participants and recent literature (Chapman and Flaws et al., 2006; Stone and Baldoni, 2006).

A research participant reflects the attitude of most Aotearoa New Zealand interviewees, when maintaining that:

Managerialism is turning universities into an economic cog, for so-called economic transformation, universities used to be neutral, but appear to have been commandeered to perform an economic function. [NZ - 4]

Another barrier to implementing learning and education-for-sustainability is the business model of more students, to attract more funding. Rising numbers of students in large lecture classes, crammed laboratories and inadequate teaching and learning spaces do not provide ideal opportunities for the collaborative and experiential learning for transformations to sustainability.

Barrow (1990:258) maintains that “the growing domination of universities by corporations and the state”, results in both organisational change and internal polarisation, in conjunction with an increased tolerance on campus that leads to a liberal academic community posing no threat to the capitalist state. In New Zealand there are few recent examples (apart from the current call to address climate change impacts) of the academic community challenging the state to make significant changes in direction, nor signs of leadership in modelling such changes. Chris Cocklin (2002), in his keynote address to the Australian 2nd National Conference of Sustainable Universities (3rd October, 2002) challenged those present with his argument that “universities are followers rather than leaders, in terms of any corporate *or* sectoral (as opposed to individualised) approach to sustainability”.

As discussed in Chapter Six, transformative leadership that can articulate a vision for wide-spread institutional change is needed, and ‘collectives’ of distributed leaders will need support of hierarchical leaders to enable this ‘collective vision’ to be heard. If university staff are not part of the collective vision, then there is likely to be inertia or even possibly ‘revolts’ by academic staff, as well publicised in 2006 when Dr John Hood, Vice Chancellor of the University of Oxford attempted to change institutional management (Lightfoot, 2006)¹⁷.

Historically, universities operated relatively independently, before the introduction of significant government funding for increasing tertiary learning opportunities for rising numbers and a greater diversity of learners, both post-secondary students and adults from the work force. The influence of increasing government expenditure on tertiary education, rising societal expectations, legal requirements and external funding

¹⁷ Lightfoot, Liz. "Oxford dons reject plans for outside rule", *Telegraph*. Retrieved on 2007-12-14.

regimes have helped create a corporate mentality where monies received (or lack of them) drive many of the current decisions about teaching and learning programmes.

Consequently, because of this funding contribution, governments expect fiscal accountability for how public monies are spent and expect universities to offer learning and research programmes that meet the needs of wider society. Some governments (for example the United Kingdom, Australia and the Netherlands) explicitly request and fund tertiary sustainability learning and research initiatives.

7.4.2 University governance, policies and management: enablers for EFS

In the United Kingdom, increasing concern about a lack of sustainability literacy, coupled with the slow implementation of sustainability programmes in all sectors of education led to a government white paper, followed by the formation of The Higher Education Partnership for Sustainability 2000 – 2003 (HEPS, 2004). This pioneering partnership initiative of eighteen universities and colleges was managed and guided by Forum for the Future, a United Kingdom sustainable development charitable organisation which works in partnership with business, higher education, central, regional and local government to advance sustainability initiatives.

In Australia, both national and state policies provide a framework for the higher education sector, for example the New South Wales (NSW) Environmental Education plan “Learning for Sustainability” outlines voluntary actions for tertiary education providers. One example is Action 44, (NSW Government, 2002:38) stating “NSW Universities are to be encouraged to expand the number of places available in environmental education courses and make environmental electives readily accessible in other programs”. In 2006, the Australian Vice-Chancellors Committee (Appendix 10) encouraged its members to:

- build capacity in the community by educating the next generation of professionals and leaders to become fully aware of sustainability;
- for students, consider embedding elements of sustainability at appropriate levels in academic programmes;
- for staff, consider implementing Professional Development programs on sustainability themes.

These examples of policies and governance for university involvement in education-for-sustainability cannot be underestimated. International participants in my research made comments that included:

Now that we have the VC as a champion, things will happen. [I-12]

It is the Deputy VC and the Chancellor who are driving these [education initiatives]. [I-7]

Our most critical support has been that of the deans getting together who see this [EFS] as in all their best interest. [I- 4]

The interdisciplinary courses would not have occurred without him [I-19]

In New Zealand, a Tertiary Education Commission (TEC) was established in 2003, as the lead agency for managing government relationships with the tertiary sector and for policy development. The TEC is charged with recommending certain directions that universities should take, requiring them to update their vision, mission statements and framework policies, and demonstrating a level of leadership by providing guidelines against which university policies can be examined.

TEC also monitors and comments on the documented and, to a lesser extent, the perceived progress of universities, measuring such progress mainly by examining Performance Based Research Fund (PBRF) 'evidence portfolios' that outline the level of staff engagement in current quality research. In addition, the number of research degree completions and the research income generated through the private and business sector contribute to the TEC determination of a Quality Evaluation for each of the eight New Zealand universities, ranking them and calculating how much funding will be delivered to those universities, on the basis of their Quality Evaluation.

The external expectations and financial relationships of governments with universities have a direct effect on university operations, as guided by university governance and devolved to a range of senior committees responsible for the academic, research, operational and management practices within the university. As in all institutions, the expressed and inherent goals of the governing group and their governance style impact significantly on the way staff and students perceive their opportunities, and the manner in which they 'work' or 'perform'.

For example, in New Zealand it is only recently that substantive recognition was given to innovative and progressive teaching. National teaching awards were eventually introduced in 2002, following the lead of some universities and departments within universities, who did seek student feedback and recognise teacher ‘excellence’ with small financial awards or ‘medals’ for teaching innovation.

A change of ‘governance’ attitude and increased support for professional development for all teachers, recognising that there are changing teaching pedagogies that can empower student learning, could assist improvements in both teacher and student learning for sustainability. In the past decade many of the new developments in collaborative learning and the co-creation of working models for more sustainable practices and teaching have been documented in a range of papers and books, as discussed in my Literature Review. A number of academic contributors to *The Sustainability Curriculum*, edited by Blewitt and Cullingford (2004), comment on the length of time, sometimes decades, that it took to achieve changes in attitudes that enabled the formulation of new policies and the development of learning and teaching pedagogies more suitable for future sustainability.

The report *I will if you will – towards sustainable consumption* from the United Kingdom Sustainable Development Commission (SDC) (2006) explains how individual change occurs more readily when institutions demonstrate they are involved in changing their own practices, and model sustainable learning and teaching practices. The report concludes that people are ready and willing to change, but need strong leadership and support from central Government and business. The role of universities as leaders places them squarely in the position of modelling sustainable learning initiatives.

7.4.3 Aotearoa New Zealand University Policies

In Aotearoa New Zealand, local government, community interest groups, businesses and organisations are increasingly engaging in dialogue about *how* they can collaborate to make the changes and re-design the systems they now use, in order to become a more sustainable society. These sectors are developing new policy, strategic plans and operational management actions to begin a collaborative sustainability journey.

Therefore, I question whether it is government policies that are a major barrier to universities coherently strategising for transitions to a sustainability paradigm. Instead my research suggests there is a general unwillingness (for a number of reasons) in universities in Aotearoa New Zealand to engage in immediate and constructive dialogue about the strategies most likely to enable and build capacity for learning for sustainability.

The public understanding of what a university considers to be of value is reflected through statements of institutional vision, mission and goals, as described on university websites. However, as of December 2007, a desk-top audit (carried out by this researcher) of current university policies in Aotearoa New Zealand reveals only three universities with policies that have progressed beyond an environmental policy focused on environmental sustainability management and operational practices.

One research participant claimed that at their university there is:

No appreciation of current sustainability issues, investing in the future, no strategic 'development' for a sustainable future. [NZ - 8]

Unfortunately, most New Zealand universities only relatively recently have developed policies for sustainable management and operational practices, as a delve into their strategic plans and policies demonstrates. In December 2007 a website search for current NZ university policies related to teaching and learning for sustainability revealed most universities have environmental sustainability (or environmental) policies or a reference to them within a University Charter. For example, University of Canterbury's final goal in a list of university wide Charter goals is: to pursue equity and environmental sustainability in all of the University's activities.

The universities of Auckland, Lincoln and Waikato now have sections in their environmental policy documents (Appendix 5), compared to their policies in 2003 (when research scoping began) that relate directly to teaching or curriculum guidance for wider sustainability goals. Auckland, Waikato and Massey Universities had explicit references, within their environmental policies, to expectations of university-wide teaching and learning for environmental sustainability (Appendix 5). The most education-for-sustainability focused comment is Auckland University's environmental

policy section 4, Teaching and research. The full statement is presented in Appendix 5, and includes:

4.1 Curriculum; The University will consider the concepts of environmental responsibility and sustainability in education processes and programmes.

The great value of university operational and management practices changing to become more sustainable is that they provide both evidence of a level of commitment to improving future possibilities for current learners and opportunities for research-linked learning on campus. Many ‘greening’ operational initiatives have been documented and researched and have proved popular with both participating undergraduate and post-graduate students alike.

The 2007-2012 Tertiary Education Strategy (TES, 2007) identifies environmental sustainability as a national goal that should be supported by universities but fails to place the goals of education into an overarching context of what excellence and achievement in learning is *for*, namely sustainability in the twenty-first century. Nor does the strategy advocate for more tertiary research and education to meet national sustainability goals but instead promotes tertiary education for meeting economic growth goals, a problematic focus if it leads to increasing resource consumption.

TEC (2007) states on their website that “The long-term outcome we want is a well-performing network of provision that produces quality outcomes for learners, stakeholders and supports government’s goals for: economic transformation, families young and old, and national identity”. I have deep concerns about the lack of any mention of sustainability and question the lack of substance of ‘quality outcomes’ that support government goals, especially given recent political statements (from November 2006 onwards) that current Government’s goals are for ‘a sustainable New Zealand’.

Universities need a policy framework that endorses, encourages and rewards, in some way, sustainable behaviours by academics, management and operational staff. Without a university vision for sustainability or a more sustainable future, accompanied by corresponding and appropriate policies, the inclusion of sustainability concepts in university teaching programmes will remain problematic,

as discussed more fully in the following chapter. It is apparent that ‘walking the talk’ is essential if people are being encouraged to engage in different practices.

In *See Change: Learning and educating for sustainability*, the Parliamentary Commissioner for the Environment (2004:86) explores the lack of tertiary involvement in education-for-sustainability, commenting that:

Sustainability is still out on the fringes of most tertiary organisations and their departments ...connections are seldom made across disciplines of knowledge to integrate thinking on sustainability.

Those universities that have yet to integrate sustainability into their strategies and policies, as a framework for the future, may choose to respond to criticism by ‘blaming’ the lack of leadership on minimal guidance by the TES. However, in doing so they would bring into question their own role as ‘leaders’ and may find it difficult to prove they *are* showing leadership in a society beset with sustainability issues.

They are also losing a twenty first century leadership opportunity by failing to present a coherent message to the tertiary sector and national government that substantive education-for-sustainability is *critical* for achieving sustainable development that leads to a sustainable future.

The New Zealand Vice Chancellors’ Committee (NVCC) appears to have no record (as at December 2007) of discussions on the role of university leadership for learning within a sustainability context. In stark contrast, the Australian Vice-Chancellors’ Committee (2006) released a Policy on Education for Sustainable Development (Appendix 10), including this statement:

The AVCC declares a commitment to Education for Sustainable Development, and acknowledges the leading role played by universities in furthering the goals of the UN DESD.

By 2020, the university sector in Australia will be playing a key role in promoting sustainability in the community through research and building capacity to achieve change for sustainability.

To date (April 2008), in Aotearoa New Zealand, there is no published coherent organization or leadership by either government (through the Tertiary Education Commission) or the university sector for exploring learning for sustainability in the

tertiary sector . Overall, there is an apparent lack of university leadership for sustainability in most universities in Aotearoa New Zealand, as evidenced from their strategies and supported by research participant responses (Chapter Five).

Furthermore, most Aotearoa New Zealand university policies, even those with environmental polices for environmental management and operational practices contribute little to teaching and learning for a more sustainable future. However, where specific sustainability coordinators have been appointed, for example at Auckland and Canterbury universities, there is gradually increasing support for activities that bring together staff from different schools, departments and faculties, to collaborate on education-for-sustainability initiatives (personal communications with academics at those universities).

I suggest that this small transition, a shift in attitudes and a willingness amongst scholars and researchers to collaborate is a first of the many steps to sustainability that will need to occur in all universities. Furthermore, I argue that it demonstrates the vital importance of having effective sustainability coordinators for linking those other ‘distributed’ sustainability leaders isolated in and by the complexity of the institution. One interviewee suggested that what is needed is:

Role models of collaboration that are then options to be implemented – and university management itself is not there, nor is governance. [NZ – 3]

It is encouraging to note that since 2003 increasing changes in policies have occurred in some universities, in response to both internal and external influences on university leadership for addressing issues of sustainability learning. Despite this, the fact that relatively limited progress has been made, in a few universities, suggests that external policies need not be barriers to sustainability leaders; rather it may be that internal factors present greater challenges to sustainability initiatives.

7.4.4 Financial influences

There is rising societal expectation that universities will provide tertiary level learning, training and leadership in areas that will assist society to reach needed common goals (ULSF, 2000; UNESCO, 2005). However, the students coming straight from secondary school to enter university are the ‘products’ of parents who

are working in a society that continues to support the ideology that we need more economists, accountants, lawyers, business managers, media and ICT experts.

The basics and some of the complexities of these professions are learned during three-year under-graduate degree programmes that tend to have (compared to longer engineering, architecture and medicine degrees) lower participation costs for students and their parents. Additionally some degrees have notable, if relatively few, examples of very highly paid individuals within those professions, for example in Law and Business Schools. However, completing degrees in the shortest amount of time is unlikely to result in new ways of thinking or opportunities for genuine collaborative approaches and needed new practices for sustainability amongst graduates.

Marshall (1996:3) asserts that “knowledge begins to be treated as a commercial product, in the ‘business’ of education”, a claim supported by comments from participants, for example:

[The university is a] More recent ‘business-driven model’ where students can be compared to ‘products’ when reaching graduation. [I-11]

There is competition between faculties and even courses within faculties for ‘bums on seats’. [NZ-3]

University policies aim to encourage as many ‘completions’ as possible, in both under-graduate and graduate programmes, to maximise government funding that is based on the number of full time equivalent students and the numbers of students are vitally important to bring in the money and corresponding government funding that then enables more research. Therefore, shorter time frames are more likely to encourage students to remain to completion, increase the number of ‘completions’ and thus more money is paid to the university, from tax-payer funded sources, for each full-time equivalent learner. In effect, shorter degrees bring in more money; however, it is debatable whether they can enable effective learning for sustainability practice, within that time frame.

Most research funding for universities comes from government funding sources and private sector partnerships or international agencies who agree to fund research for wider public benefit. Interviewees and contributors to the literature note there are numerous

challenges in the process of distributing grants for research within and across university departments. Where disciplinary panels are responsible for the allocation of research funds it appears there is disciplinary competition and favouring of discipline bound research projects with short time frames more likely to deliver results more quickly and are easier to publish, rather than longer time frame trans/inter-disciplinary research.

One international interviewee explained at length (paraphrased here):

...that despite national priorities for interdisciplinary research, the appointed disciplinary based researchers charged with prioritising and allocating competitive funds would consider only those projects that had been separated into their social science and ecology components (for example) rather than presented as an integrated problem. [I-11]

Similar claims are made by other participants, including New Zealand academics, suggesting there is an apparent lack of understanding of the complexity of sustainability challenges and the critical need for cross boundary research, plus a lack of awareness of the extra time frames that are often needed to collaborate, plan, research and then publish the findings.

In addition, publishing of cross disciplinary findings used to be a challenge in itself. However, more academic journals have acknowledged the importance of such research and this decade have published special issues that bring together sustainability issues in their scholarly field, as cited in Chapter Three.

International interviewees described how these funding problems could be overcome by forming inter-disciplinary teams, for example:

We form collectives across the university to bring together researchers for particular research activities, ones that need a range of disciplines ... and more external funding comes in (directly to the team) as teams of researchers are successful. Requests for this type of research are increasing, especially in the public health area. [I-4]

This comment on 'collectives' reflects the strength of connections and collaboration between the distributed sustainability leaders in influencing funding managers.

This interviewee describes the huge gap in expectations between funders and the university:

We have some real tensions now between universities and external funding agencies. A classic example is they want end use outputs, they want collaboration, they want engagement with stakeholder. If you are a really clued up sensible academic you won't have a bar of that. You will just try and get your funding for science research do it on your own, churn out the journal articles and the books because you will get big ticks for that from the university. [NZ-2]

These responses reflect a wide range of challenges and opportunities for surmounting the research funding barriers that are experienced across the university. With improved hierarchical support for more collaborative learning and research processes for cross disciplinary teams for sustainability, then the university will take its place as a leader (a possible guiding 'spaceship') for learning for a more sustainable future.

Kate Sherren (2006c:1) investigates the institutional barriers to the development of innovative programs (above the level of an individual paper) in seven Canadian universities, finding that "university structure and administration have a large impact on educational design, and that tight budgets are a major challenge to curricular or organisational innovations for sustainability." One of the three concluding themes that emerged from Sherren's analysis is the difficulty of transforming the university in a time of financial constraints, an aspect that was not claimed as a major problem by the academics I interviewed, although three interviewees noted sharing budgets across disciplines as a challenge.

I suggest it is more probably an intrinsic intellectual problem, grappling with understanding that the needs of the students, and therefore the need for learning for sustainability, are greater than the needs of the institution. From such understanding, challenges will be overcome more readily, as has occurred in selected international universities.

Aotearoa New Zealand universities, as do those in other countries, compete for students, research monies and staff. According to Drummond (2003), economic values are driving education towards "learning as a commercial enterprise" which while it may help produce people who contribute to the consumptive and non-sustainable patterns of our present 'developed' society, fail to support and provide the 'attachment' that people need to their underlying culture, their biophysical environment and their social community.

Unfortunately challenges of disengagement from the natural physical and socio-cultural world prevail in many large institutions and corporations. This challenge is effectively modelled by many universities in the way they are physically structured with tower blocks of lecture rooms, offices and teaching and research rooms. There are predominantly traditional lecturing and research spaces, as well as more recent additions and refurbishments providing improved learning spaces for students.

In order to provide appropriate teaching and learning spaces and support for authentic learning for sustainability, learning spaces that encourage inquiry and collaborative learning are required, with supporting technologies and appropriate teaching pedagogies. Investments in new university buildings and refurbishments of existing learning spaces not only need to use sustainable building resources but also need to model sustainable building practices and include more sustainable operational systems.

Cocklin (2002:8) notes that “Investments in sustainability often involve higher costs and longer payback periods” so when budget managers are presented with proposals for sustainability initiatives that need higher levels of funding, and there is no mandate or vision for sustainability, the funding for sustainability initiatives slips down the list of priorities. Sometimes, following frustrating and time consuming negotiation, funding is eventually agreed to, often with extra costs incurred because of delayed time frames.

7.4.5 Reward Systems

Another financial influence, linked to government funding policies is the current focus on the numbers of academic publications produced by a university, using these figures to determine, in part, how much public funding the university receives. Internationally there are varied ways that funding is prioritised, including more focused and stringent measures around academic publications, for they can be ‘counted’ and are presumed to contribute to ‘excellence’ of a university, despite current concerns about the meaning of excellence (Readings, 1996), and *for* what?

The Performance Based Research Fund (PBRF) in Aotearoa New Zealand uses a university ranking system, to accord research funding to universities, on the basis of that PBRF ranking of ‘excellence’. According to interviewees and other participants, academics with a high teaching load have little time to do their research, and it is

even more difficult to do collaborative research (in terms of time) and then find the time to prepare their research findings for publication.

The stress and the inequity of the system are described by these interviewees, both with large teaching loads:

The people who work in this field [sustainability] work 80 hours a week doing our university workload. [I-3]

We've set up the reward system so that somebody who doesn't produce large amounts of published material doesn't get rewarded. [I-11]

The flow on effects of this career system lead to questions about the reality of what is more critical in the first decade of the twenty-first century? Is it rewarding research that is primarily focused on topics that are easy to research, write up and publish? Or should it be rewarding effective teaching practice, supported by research, that enables substantive learning for sustainability for all students?

7.5 Political influences on university policies for sustainability

Researchers and lay commentators regularly recommend that governments, communities and businesses accept their public-good responsibilities and 'take action' for sustainability in appropriate ways. Internationally, government driven policies are encouraging learning for sustainability in universities. Countries with national policies that include references to tertiary learning for sustainability include Australia, Brazil, Japan, Taiwan and many countries in the European Union. In Sweden, in response to concern about the slow implementation of sustainability initiatives, a law requires *all* educational institutions to integrate sustainability teaching and learning into their teaching programmes (Swedish Government Communication; SOU 2004:104).'

Individual university leaders for sustainability are making huge efforts to voice their concerns through the focus of climate change and equitable social development. However, until there is wider university involvement with the arguably current and critical issue of how to take action for creating a more sustainable future, government policies prevail. Policies for mitigating negative impacts, such as reducing car emissions, improving public transport, charging for waste disposal and fining

polluters of water all play a role in raising social awareness of sustainability issues. Despite this, universities are slow to respond in a substantive way with concomitant re-orientation of teaching pedagogies to increase student involvement in learning and acting for ‘strong sustainability’.

As part of examining the role of politics as an enabler or a barrier to change in tertiary education, it is encouraging to note the United Kingdom’s Sustainable Development Commission’s (SDC) statement for learning, in *Forum for the Future* (2004:3):

It is imperative that young people’s experiences of education from nursery school to university equip them with the knowledge, skills and values needed to live and work sustainably. And once they have become adults the learning shouldn’t stop. Whether it’s in the workplace or in communities, sustainable development is a lifelong learning journey.

The Sustainable Development Commission (SDC) began a two year collaboration with the United Kingdom’s Department for Education and Skills (DfES) in 2005, aiming to embed sustainable development policy and practices into all areas of learning, including higher education. The Higher Education Funding Council for England (HEFCE) is another example of political influence helping to overcome barriers, for example in their report on Sustainable Development in Higher Education (2005:28) one of the agreed actions is:

To ask the Higher Education Academy, in the course of its ongoing work on sustainable development, to be alert to anything in the QAA precepts or codes that might work against including sustainable development in the curriculum, and if so to raise it with UUK, SCOP and the QAA.

HEFCE aimed to review their approach to sustainability in higher education in late 2007. However, that review is still to be published.¹⁸

All the research participants from universities in Aotearoa New Zealand referred to the problem of university politics and the continued focus on management, economic and publication outputs. One reason often cited for not trying to change institutional policies, educational programmes or management practices is a lack of political support within the university.

¹⁸HEFCE documents available at: http://www.hefce.ac.uk/pubs/hefce/2005/05_28/

When asked what they mean by ‘lack of political support’, interviewees frequently mention the lack of leadership support, few or appropriate guiding policies and departmental or disciplinary ‘politics’ as well as limited opportunity for engagement with others interested in sustainability initiatives.

As one research participant commented:

Departments and universities have become hotbeds of political discord, partly that is because so many different abilities are vying for recognition and space.
[NZ-10]

Another interviewee lamented:

Curriculum meetings used to be held, these provided discussion and knowledge of what else is being taught ... now there are big changes and new staff and no connections, no knowledge of others’ work so it is now more difficult to collaborate. [NZ –4]

Unfortunately, issues such as these, and along with the challenges, as reported by research participants and discussed in the academic literature, severely limit the opportunities for the university to engage effectively in more appropriate collaborative, trans- or inter- disciplinary systems-learning to enable better understanding of both the complexity of the real world and human dependence on healthy ecosystems.

University leadership for sustainability is needed, particularly transformative leaders who connect and work collaboratively, in ways that reflect my dendritic framework for enabling university leadership for sustainability to develop learning for sustainability initiatives.

7.6 Current university curricula for sustainability – in Aotearoa New Zealand

It is highly unlikely that any university lecturer in Aotearoa New Zealand is unaware of most of the current and predicted environmental and social sustainability challenges facing society. All academics will have access to enough information about such issues to incorporate some aspects of general sustainability contexts into their areas of expertise or disciplinary curriculum requirements. The question is whether they are meeting the challenge to integrate these issues, adjusting their pedagogical practices by building

deeper understanding through participatory learner centred approaches that engage students in building new knowledge, especially in a coherent and systemic way.

As briefly outlined in Chapter Two (section 2.4.3) Chapman and Flaws et al. (2006) conducted a library search for the year 2004 and found only 46 courses that appeared to be related to sustainability being offered through universities in Aotearoa New Zealand. However, there were no degree programmes with ‘sustainability’ as the learning context and framework. A further investigation, conducted during 2006 by Stone and Baldoni (2006), suggests there are now 68 courses, though only a few have titles explicitly related to sustainability.

Degree programmes aligned with specific professional bodies, for example the New Zealand Institute of Architects, the Institute of Professional Engineers New Zealand (IPENZ) and the New Zealand Planning Institute provide specific papers and research project opportunities that explore sustainability issues likely to be faced by practitioners in those professional fields. Research projects are undertaken in partnership with local authorities, research institutes and organisations dealing with environmental and social sustainability problems. There are some ‘lone-rangers’, and occasionally a small group of teachers within other disciplines, for example Accounting, Biological Sciences, Chemistry and Environmental Sciences and Geography actively infusing some aspects of sustainability issues and concepts into their teaching programmes.

A few short summer school programmes, often targeting specific concerns such as climate change are offered at a number of New Zealand universities. These short courses are attended by interested people from the wider community, including students considering whether to take papers that offer more insights into global issues. Dedicated short courses on sustainability issues do provide rich information and general knowledge, however there is generally not enough time or appropriate opportunities taken to incorporate experiential learning. The latter is important for developing the values and thinking skills, such as critical reflection and strategic planning, needed for adapting to the challenges of the twenty-first century.

Unfortunately these teaching efforts are piecemeal, do not appear to be related to each other and reach only a minority of university students. Nor do the courses and papers fit within an organised framework of ensuring learning and action for sustainability for all members of the university, students and staff.

In contrast, external to the university there are short sustainability courses offered through support from local authorities, for example the *Sustainable Households Programme*, recently re-named *Sustainability Living*¹⁹ in a number of regions, where learners do become personally involved in more sustainable living practices. Given the often expressed concern regarding students' general 'literacy', and the understanding from research that students learn best when learning in contexts relevant to their future, the question remains as to why New Zealand universities are failing to consider 'sustainability literacy' as a key part of students' generic learning.

There is an urgent need for universities to engage much more intensively with research into teaching and learning in the tertiary sector, especially in action-research that builds understanding of how students perceive their learning needs for a predicted challenging future. Following my participation at an intensive University Leaders for a Sustainable Future – Asia Pacific Economic Community (ULSF–APEC) workshop in Japan, I noted the need for such action-research in New Zealand and recommended (Williams, 2004) that a way forward could be the establishment of collaborative Centres of Excellence, with a focus on Teaching and Learning for Sustainability. I note that there is discussion about such initiatives (Haigh, 2003) and look forward to the developments, in different regions of the country.

7.7 Summary

In this chapter I have explored, with reference to research and literature relevant to education and leadership for sustainability, the many different ways in which universities can contribute to learning for transitions towards understanding and living a sustainability paradigm. I have noted the challenges to these transitions and suggested that the evidence from participants in my research and the academic

¹⁹ Available at: <http://www.sustainableliving.org.nz/>

literature is that these barriers can be overcome to provide a level of sustainability literacy for all learners.

I have discussed the value of using appropriate teaching pedagogies for sustainability learning and the possibilities for university staff professional development. In addition, I referred to the literature calling for changes in pedagogical practice and noted many new opportunities for creating learning programmes with interdisciplinary components, with reference to the disciplinary expertise needed as part of that holistic learning for a sustainable future.

Given the level of change that will eventually be needed, the role of leadership for sustainability, as expressed through university governance, management and policy development is crucial for initiating and supporting the transitions required to create a sustainability-focused university. I discussed the value of student contributions to sustainability initiatives and argued for employing knowledgeable university sustainability coordinators to help distributed leaders for sustainability to connect and collaborate for learning and taking action for change in university teaching and research.

Throughout this chapter, the role of leadership was either implicitly or explicitly implicated in the positive contributions that universities have made, or could make, when choosing to join other twenty-first century leaders for a sustainable society. The reality is that a minority of universities are demonstrating leadership in substantive education-for-sustainability. Consequently, there are significant opportunities for universities to demonstrate leadership in this arena, if they engage in supporting those individual leaders for sustainability distributed across university departments.

The evidence of increasing levels of governance leadership for sustainability, despite the dearth of explicit support for education-for-sustainability in current university policies and charters that were developed prior to 2006 was noted. I suggested there is a timely opportunity for the Tertiary Education Commission to influence universities to comply with and improve New Zealand government goals for sustainability.

In Chapter Eight I comment on and summarise the conclusions from my research findings and posit that using the theoretical model of a dendritic framework for leadership for sustainability has the potential to help leaders for sustainability move Aotearoa New Zealand universities towards more coherent and substantive learning for sustainability. I argue that there are imperatives for changing university and funding policies, and providing professional development for academic teachers, to enable universities to lead society in learning the skills needed for living in the twenty-first century.

CHAPTER EIGHT

Conclusions

‘A Possible Dream’

‘There is no use trying’, said Alice; ‘one can’t believe impossible things’. ‘I dare say you haven’t had much practice’, said the Queen. ‘When I was your age, I always did it for half an hour a day. Why, sometimes I’ve believed as many as six impossible things before breakfast.’

Lewis Carroll²⁰

8.1 Introduction

This thesis is a call to universities to move beyond a perceived ‘impossible dream’ that they could become leaders in educating for sustainability, to living the ‘possible dream’ of leadership for sustainability. As I have discussed in preceding chapters, universities can be places of learning for a sustainable twenty-first century, enabling and empowering students, teachers and their wider communities to engage in the critical thinking and changes in behaviour needed to mitigate and adapt to escalating global and national sustainability challenges.

Education-for-sustainability offers university students and staff a platform for exploring the extent of our personal and social impacts on our environment, one that is shared with all of humankind and those millions of species that provide and support the eco-system services on which we all depend. Most importantly, effective sustainability learning pedagogies provide learners (students, management, academics and operational staff) with a range of skills, including critical thinking skills, engagement in collaborative learning processes and empowerment for taking collective and individual action for changes that lead to transitions towards a sustainability paradigm.

²⁰ Carroll, L. 1994. *Alice’s Adventures in Wonderland*. New Ed edition. London: Penguin Classics.

In this thesis I have explored the generic global, national and organisational reasons for engaging in education for a more sustainable future, describing the contributions that universities can make to the quest for a sustainability paradigm. I then presented the context for my research and explained my reasons for choosing grounded theory methodology, for examining and analysing my data and findings from that data. Using grounded theory revealed two key themes that underpinned the findings, leading to an emergent theory, relating to the role of university leadership for sustainability.

Chapter Six described the development of this theoretical model, an active dendritic framework for university leadership for sustainability. This model sits within an ecological paradigm of connectedness, complexity and feed-back responses that reflect the activities of the ecological systems that maintain all life on planet earth. In a world of increasing social fragmentation and environmental disturbance, this model reflects the post-modern shift towards acknowledging the connectedness of diverse understandings, vital components of a holistic sustainability paradigm.

The model provides the frame through which I addressed the research problems that led to this doctoral research. A variety of ways that universities can and do contribute to learning for sustainability are described in Chapter Seven, with reference to the role of leadership support for sustainability education. Also in Chapter Seven I explored the generic challenges faced by those sustainability leaders initiating, developing and increasing sustainability programmes in universities, with particular reference to leadership support for overcoming structural and cultural barriers.

8.2 Conclusions from Research Findings

The thirty participants formally interviewed for this study generated a wealth of data, from which key findings were generated. These findings are:

Hierarchical leadership support is key for the successful implementation of faculty and university sustainability programmes, and reducing the effect of challenges to progressing new learning.

Collaboration between distributed, individual academic sustainability initiatives is needed for building capacity and gaining support from university leaders for sustainability learning initiatives across the university.

These key findings contribute to providing answers to the original research problems; which were:

What are the key barriers and challenges encountered when developing new university courses with significant learning opportunities for understanding [strong] sustainability issues?

What processes had been successfully used, and how were they progressed to overcome these barriers and challenges and establish [strong] sustainability learning programmes?

What are the generic key processes and associations, or relationships, within the university community that need to be understood when planning and developing new sustainability learning initiatives?

How can university academics be encouraged and empowered to better understand and use associations, processes and procedures more likely to assist their efforts to establish sustainability learning initiatives, for themselves and their students?

Following the emergence, through using grounded theory, of a theoretical framework for enabling university leadership for sustainability, I reframed the research problems as questions, in a context of leadership:

What is the role of university leadership support for influencing and implementing education-for-sustainability initiatives?

How do university leadership processes influence academic teaching and learning for sustainability?

Which leadership models are likely to be effective for leading transformational changes needed for sustainability initiatives?

Which leadership models provide a connected framework within which sustainability focused university leaders could widen their initiatives?

When comparing the progress in implementing substantive sustainability learning programmes between the two subsets of universities, findings showed that, compared to those international universities in my research sample, the slow progress in universities in Aotearoa New Zealand could be explained by lack of coherent and strong hierarchical leadership support, as reported by participants. This was reflected, at the time of my data gathering (2004 – 2006), by university vision statements and strategies that lacked substantive references to sustainability. Exceptions at that time were Lincoln University and Massey University.

Participants noted that this lack of university leadership echoed the government of the day's limited focus on the increasingly complex environmental and social impacts of unsustainable practices. There was no coherent leadership for addressing and meeting increasingly alarming sustainability issues (for example; health, social inequity, environmental degradation), no policies coherently and strategically developed for addressing problems of un-sustainability (apart from the four work streams within the Ministry of Environment's SDPOA, 2003), a very muted level of social debate and no national strategy for a sustainable future.

Fortunately, this situation is changing, in response to the increasing global focus on climate change, one of the arguably critical symptoms of unsustainable practices. Aotearoa New Zealand now has government aspirational statements and increased numbers of directed policies for action for sustainability in government ministries.

Strikingly, societal concern, as evidenced by increasing levels of local government, community groups and individuals focusing on sustainability initiatives, has not been reflected in universities. University students' learning (according to research participants and the literature) mainly reflects the unsustainable modern paradigm that continues to lead to currently escalating sustainability issues for future generations.

University leadership for sustainability is of paramount importance, for initiating changes and transitions to student and staff learning within a post-modern sustainability paradigm.

8.3 A dendritic framework for university leadership for sustainability

I suggest that my model – an active dendritic framework for university leadership for sustainability – may be useful for encouraging university sustainability leaders to actively seek connections and forge collaborations for learning to meet current and predicted environmental and social challenges. In Chapter Six I describe this theoretical framework using the metaphorical analogy of the human nervous system, where both the central nervous system (nerves in the brain and spinal cord) and the peripheral nervous system (nerves in the rest of the body) are intricately connected. It is the interaction between these two major groupings of neurons that enables the body to respond to internal and external stimuli, whether subtle or extreme, to maintain body health.

In a similar manner, it is the interactions and collaborations between university ‘hierarchical’ (positional) leadership, and those ‘distributed’ sustainability leaders developing and implementing sustainability learning courses, that could enable wider and more effective university engagement with the current sustainability paradigm.

In Chapter Seven I discussed the contributions that a university can make as a leader in sustainability education and research, and suggested how universities in Aotearoa New Zealand could learn from international sustainability learning initiatives, despite the acknowledged, generic challenges facing change movements within our universities. The evidence for these success stories is shown by increasing numbers of publications debating and detailing individual and university-wide sustainability initiatives. Careful reading of the case-studies reveals that the role of leadership, whether implicit or mentioned briefly, is crucial to the success of the curricula initiatives in particular.

With reference to the question:

What is the role of university leadership support in influencing and implementing education-for-sustainability initiatives?

My research shows that where leadership support is lacking, these initiatives fail to flourish. Where university hierarchical (positional) leadership supports ‘distributed’ sustainability leaders who are developing and teaching within a sustainability context there is increasing capacity building for sustainability. Scholars describe building communities of learning, shaping the learning culture and encouraging more connected learning, thus opening up possibilities for individual and community influence and action for sustainable teaching and learning initiatives.

Despite the presence of individual ‘lone-rangers’ who operate as ‘distributed’ and sometimes isolated sustainability leaders, located within disciplinary silos and occasionally across disciplinary boundaries, there are few examples of university programmes with a sustainability focus, in Aotearoa New Zealand. There is evidence of increasing numbers of papers and courses that appear to include some elements of sustainability learning (Stone and Baldoni, 2006), suggesting that there is growing capacity in terms of numbers of distributed leaders for sustainability, not yet matched by explicit support from university hierarchical leaders.

In Chapter Seven I explored a range of generic barriers and challenges to systemic change in universities, noting increasing numbers of published case studies describing how these hurdles have been surmounted to develop and implement sustainability-focused programmes of learning, in international universities. My research findings show there is no ‘blue-print’ or ‘best’ process of developing and implementing sustainability initiatives, as supported by the literature (Chapter Three). Rather there are many and varied opportunities within universities for improving engagement and building capacity for needed transitions to sustainability teaching and learning programmes.

With reference to the question:

How do university leadership processes influence academic teaching and learning for sustainability?

My research indicates that challenges are reduced when there is hierarchical leadership support for the teaching and learning initiatives implemented by

distributed leaders for sustainability. Individual distributed leaders are usually operating within a university culture not yet ‘tuned in’ to the arguably twenty-first century imperative for deeper understanding of the complexity of sustainability problems. These distributed sustainability leaders comment on the lack of connections to other sustainability teachers in universities in Aotearoa New Zealand.

The theoretical dendritic framework for leadership for sustainability is supported by participant descriptions of the processes undertaken to overcome challenges and move around barriers to university learning for sustainability initiatives, demonstrating the relevance and ‘fit’ of the framework. When viewed through this frame, it becomes apparent how distributed leaders successfully sought and obtained support from hierarchical leadership for widening and strengthening sustainability initiatives. I posit that the success of these initiatives depends greatly on the actioning of connections and collaborations between distributed and hierarchical university leaders for sustainability.

With reference to the question:

Which leadership models are likely to be effective for leading transformational changes needed for sustainability initiatives?

The research participants described leadership characteristics that reflected a transformational style of leadership (Bass, 1985, 1988; Burns 1978, 2003). This characteristic in a leader is more likely to encourage the relevant connections and collaborations for successful initiatives, as described by research interviewees. Attributes of transformational leadership include envisioning, connecting to others, sensitivity to the needs of others, inspiring collaboration and being prepared to initiate needed changes. These key attributes are needed for successful changes in educational institutions, as reported in the leadership literature.

Aspects of leadership relevant to change in educational institutions are explored in the Literature Review and Chapter Six.

With reference to the question:

Which leadership models provide a connected framework within which sustainability focused university leaders could widen their initiatives?

There are occasional and usually brief references to the role of university leadership in the scholarly literature debating educating for sustainability in universities. Despite this, I have failed to find a model that resonates with and reflects my research findings of the key importance of hierarchical support and connected distributed university leadership for implementation of learning for strong sustainability.

Therefore, I propose my theoretical model:

- *an active dendritic framework for university leadership for sustainability* -
for consideration as a useful tool to build connections and collaboration between distributed and supportive hierarchical leadership, thus building the capacity for learning for sustainability initiatives within universities.

8.4 Implications for Universities in Aotearoa New Zealand

Some university vision statements and related policies reflect organisational levels of awareness of both the problem of non-sustainable practices and the desire to be part of making a difference, yet reveal little movement towards coherent university-wide transitions for sustainability. Despite this apparent rhetoric and given the intellectual capacity within a university, I suggest that there are relatively few individuals totally isolated from the notion of learning for the future. I argue that very few, if any university teachers are unable to contribute towards new sustainability learning initiatives.

I predict that students will, in the near future, seek and select university courses that offer opportunities for learning within a sustainability context and/or degrees that encourage and support inter-disciplinary learning. There are now over 500 primary and secondary schools in Aotearoa New Zealand enrolled in the EnviroSchools Programme, with a strong focus on holistic sustainability learning. Many of these current students will be seeking tertiary qualifications, some in five years time. These

students are already, through Enviroschools and the inclusion of environmental sustainability and global citizenship in the new revised New Zealand School Curriculum (Ministry of Education, 2007), experiencing learning as system-thinkers for sustainability.

I suggest it is unlikely that university students will be satisfied with didactic disciplinary learning, leading to thinking that continues to support the modern, industrial paradigm that contributes to increasing use of finite resources and exacerbates environmental impacts that negatively affect all living organisms. I predict future learners will seek deeper understanding of sustainability issues in order to create change and re-design institutional and social processes as part of creating a sustainable future for themselves and their communities.

Furthermore, it is problematic to expect students graduating this decade to be able to creatively use the information they have absorbed, if they have had no experience of interdisciplinary, collaborative, problem-solving learning for the future. As discussed in earlier chapters, scientific facts and data are in themselves insufficient, in fact they may be counter-productive (Palmer, 1998; Sterling, 2001) when seeking to change knowledge, attributes or behaviour. What is needed, beyond information, is empowerment and opportunities for changing practices.

In October, 2007 The United Nations Environment Programme released the fourth 'Global Environment Outlook: environment for development' (GEO-4) detailing the deterioration of our life-supporting ecosystems and calling for more urgent changes in policies to reverse this deterioration. Government policies play an important role in providing a visionary 'compass' for helping guide the numerous and diverse sustainability initiatives already underway, in pre-tertiary education, local government and scores of voluntary groups involved in changing environmental, social and cultural practices. Government policies encouraging meaningful changes in teaching practices in education institutions are long overdue.

It seems timely to consider the role of leadership in the number of the arenas that have been identified as critical for capacity building through engaging in the new

learning and teaching paradigm of education-for-sustainability . There are many reasons why leadership at all levels and across all sectors of the university should be engaged in re-designing university programmes to meet predicted sustainability challenges, the wider context for this thesis.

Universities, through their leadership, could choose to engage in a vastly more credible role in twenty-first century, post-modern education-for-sustainability. I firmly believe that universities in Aotearoa New Zealand should become involved in transitions towards more appropriate teaching pedagogies and learning for sustainability initiatives. Furthermore I suggest the ‘quicker the better’, before the Government is forced to confront current inert tertiary education sustainability education by regulating fiscal, research funding and curricula requirements, as is happening in Sweden (SOU, 2006) and the United Kingdom (HEPS, 2005).

In Aotearoa New Zealand, the Tertiary Education Commission (TEC) is responsible for leading the government’s relationship with the tertiary education sector and for policy development and implementation. In the 2007-2012 Tertiary Education Strategy (Ministry of Education, 2007:8) it is stated that “Tertiary education will help achieve that (national) goal by providing high quality learning and research, contributing to the sustainable economic and social development of the nation ...” Furthermore the claim is made that there is a need to “balance progress with environmental sustainability by providing New Zealanders with the knowledge and skills to understand and work within environmental constraints” (ibid.:9).

Nowhere in the strategy is there explicit acknowledgement of learning within a sustainability paradigm or any reference to international calls (UNESCO, IUCN, WWF) for tertiary teaching and learning for understanding and addressing growing sustainability issues. The Tertiary Education Strategy (TES) reflects the ‘modern’ paradigm focus on economic growth, far more than the interconnectedness of social, cultural and environmental complexities that reflect the future needs of the twenty-first century.

When reading the strategy, one interpretation that could be made, due to the constant reference to reducing disparities by ‘raising achievement’ through ‘excellence’ in teaching and research, is that student learning will culminate in being *for* more economic growth, based on consumption, exacerbating current environmental and social problems.

There is a clear disconnect between this current TES and a twenty-first century focus needed in universities on learning *for* changes *for* a more sustainable future. The concept of university leadership for a sustainable future appears irrelevant to those who formulated a TES strategy that fails to provide a coherent vision *for* a preferred future.

8.5 Recommendations

The following recommendations for universities in Aotearoa New Zealand are supported by three different components of my thesis. These are:

1. International participant accounts of successful processes for implementing learning for sustainability initiatives in their universities.
2. Increasing numbers of case study descriptions in the scholarly literature, of current examples of learning for sustainability papers, courses and programmes.
3. Key research findings that active connection and collaboration between distributed leaders for sustainability is necessary for building capacity for sustainability teaching programmes, and support from hierarchical university leadership is needed for enabling university wide learning sustainability initiatives.

Ramsden (1998:4) states “the most substantial advantage a university in a competitive and resource hungry higher education system can possess is effective academic leadership”. I suggest that Ramsden’s contention should, in this decade, be extended by adding ... ‘for sustainability’. Furthermore I argue that a university that shows it offers society new understandings and possibilities for managing current and predicted sustainability challenges not only fulfils its tertiary education role, but will create a competitive advantage for that institution. Employers seek graduates with skills and knowledge wider than the traditional ‘disciplinary’ content.

8.5.1 *University policies for sustainability*

I recommend that universities undertake a collaborative learning process, involving all members of the university, to develop authentic vision, mission and strategy statements and policies for sustainability within their specific institution.

Involving all staff, students and the wider university community is an important part of raising awareness of the extensive range of opportunities that exist for including a context of sustainability in individual's work. Inherent in suggestions for using sustainability learning as a mission and focus is the implied need for appropriate leadership to help integrate the sectors of a compartmentalised institution into an interconnected, sustainable learning organization. I offer my theoretical model, a dendritic framework for university leadership for sustainability as a frame for actioning timely connections and collaborations for cultural transformations within the university.

8.5.2 *University leaders for sustainability*

I recommend that Vice Chancellors of universities focus on recruiting appropriate future-thinking 'leaders' for sustainability, and provide current university leaders with professional development in leadership for meeting and adapting to twenty-first century challenges.

Burns (1978) discusses the style of leadership for transforming businesses and implies that the 'revolutionary' leader is key for successful change in times of turmoil. Given the rapid rise in environmental and social problems with increasingly negative effects on social equity and sustainable life styles I argue that all teachers, scholars, researchers and management staff in universities should be engaged, in ways that are appropriate to their university roles, in transitions to learning and teaching for a sustainable future.

How 'revolutionary' these engagements are will be testament to the intellectual courage of all transformative sustainability leaders, whether occupying hierarchical positions or 'distributed' across the university. There is a 'glorious' opportunity for universities to actually lead transformational change of teaching and learning practices, when leaders and followers share a vision for a sustainable future, for themselves and future generations.

A few universities have employed knowledgeable and credible ‘sustainability champions’ to work with operational and management staff, and teachers, and these champions will know many of the university staff and students interested in learning for sustainability. However, where there is no explicit governance vision, or hierarchical support for changes for sustainability learning and practice, the sustainability initiatives of such ‘champions’ fail to be adopted more widely.

8.5.3 Funding for sustainability teaching and research

I recommend that research funding regimes and career promotion opportunities are re-orientated to reward those scholars prepared to expend the intellectual energy and effort to re-design their teaching programmes to include more opportunities for sustainability learning and research.

Teaching initiatives include, for example; ensuring that all undergraduate first degrees include a core sustainability paper and integrating the sustainability context into a wide range of disciplinary papers. Other initiatives include providing extra funding for resourcing inter-disciplinary and trans-disciplinary research, providing opportunities for collaborative professional learning for sustainability and engaging in community learning programmes.

Academic teachers have an important leadership role to play in the educating of students and their community about current understandings, based on existing knowledge, of how our complex world works – the role of most disciplinary based undergraduate teaching. They also have a critical role in preparing and empowering students to seek further understandings of how they might create and interpret new knowledge, in effect transforming knowledge in order to respond in a timely fashion to future challenges.

Connectedness and collaborations across disciplinary boundaries are crucial for wider learning for sustainability within universities. Where degree programmes include strategic and planned opportunities for holistic learning for sustainability, then those programmes should be well supported, financially and as part of transitioning to a diverse and connected post-modern ‘sustainable education’ (Sterling, 2001).

8.5.4 Teaching the Teachers

I recommend that university leaders offer and reward professional development for teaching staff in best practice learning and teaching pedagogies, using sustainability as a context for their learning.

As discussed in Chapter Seven, one of the identified challenges to teaching for sustainability is the ‘state of play’ of current university teachers’ understanding of both the complexity and interconnectedness of sustainability issues and the learning pedagogies that enable students to develop the inquiry, critical thinking, system thinking and collaborative skills to engage with and become empowered to take action that appropriately addresses sustainability issues.

Faculties and schools should expect and reward, through time allocations and career promotions, staff involvement in collaborative learning communities. Such communities can strategically plan how to make the steps for changing course and programme structures to ensure all students engage in appropriate levels of learning for sustainability, either as an integrated concept or a ‘concept paper’ offered as the big picture frame within which ‘fragments’ of the collage of knowledge can be connected, reflecting the connectedness of the world in which we live.

There are many more recommendations that could be offered. However, each university is unique and the processes undertaken will depend on the style of leadership, the connectedness of the hierarchical and distributed leaders for sustainability and the current level of sustainability initiatives in that university. There may be a well supported ‘sustainability champion’ staff member at work within one university, an influential hierarchical leader in another, or an enthusiastic and active student group initiating operational sustainability initiatives, then influencing learning curricula.

8.6 Concluding Thoughts

For universities to further delay embarking on the transitional steps that are needed to set in motion strategic re-orientation processes for learning and teaching for sustainability is to shirk our professional and personal adult responsibilities for current and future generations of students. If universities fail to engage in education-for-sustainability, then they may encounter genuine antipathy from a society wishing

to move beyond rhetoric and academic debate, to learning *how* to manage current and predicted challenges to a sustainable future.

Furthermore, I argue that if universities fail to engage in learning *for* sustainability, society may look to leadership from government and support government intervention in education to achieve national goals of sustainable development. One possibility is to make it a legal requirement to include education-for-sustainability (as in Sweden) in all sectors of education, particularly the tertiary sector, and develop a new Tertiary Education Strategy to better reflect the sustainability context. Another intervention is to strategically re-orient funding for university teaching and research to encourage changes to learning for sustainability, as occurred in Taiwan (J. Su, personal communication, January 25, 2006).

Universities need to develop a focus on seeking collaborative visions, strategies and opportunities for sustainability learning and teaching, for all members of the university. I suggest that maintaining a ‘business as usual’ approach is the metaphorical equivalent of the behavioural challenge that humans face when attempting to alter entrenched habits, particularly addictions, to make changes that lead to a preferred, healthier lifestyle.

Active, connected transformative leadership is the key to unlocking the potential of the university to engage in teaching and learning for a much needed twenty-first century paradigm of sustainability. Current and future sustainability leaders could use the ‘device’ or tool of an *active dendritic framework for university leadership for sustainability* for better initiating, broadening and supporting education-for-sustainability.

Now is the time for change, to bring together university sustainability leaders, through active processes of connection and collaboration, akin to a dendritic system, to guide the university towards becoming a leader in the human quest for a more sustainable future.

For in the final analysis, our most basic common link, is that we all inhabit this small planet, we all breathe the same air, we all cherish our children's futures, and we are all mortal.

John F. Kennedy, 1963²¹

²¹ Speech delivered at American University, Washington, DC, 10 June 1963.

APPENDICES

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APPENDIX 1: The Talloires Declaration

Over 350 international Universities are signatories

We, the presidents, rectors, and vice chancellors of universities from all regions of the world are deeply concerned about the unprecedented scale and speed of environmental pollution and degradation, and the depletion of natural resources. Universities have a major role in the education, research, policy formation, and information exchange necessary to make these goals possible. Thus, university leaders must initiate and support mobilization of internal and external resources so that their institutions respond to this urgent challenge.

We, therefore, agree to take the following actions:

- 1. Increase Awareness of Environmentally Sustainable Development**
- 2. Create an Institutional Culture of Sustainability**
- 3. Educate for Environmentally Responsible Citizenship**
- 4. Foster Environmental Literacy For All** - Create programs to develop the capability of university faculty to teach environmental literacy to all undergraduate, graduate, and professional students.
- 5. Practice Institutional Ecology**
- 6. Involve All Stakeholders**
- 7. Collaborate for Interdisciplinary Approaches** - Convene university faculty and administrators with environmental practitioners to develop interdisciplinary approaches to curricula, research initiatives, operations, and outreach activities that support an environmentally sustainable future.
- 8. Enhance Capacity of Primary and Secondary Schools** Establish partnerships with primary and secondary schools to help develop the capacity for interdisciplinary teaching about population, environment, and sustainable development.
- 9. Broaden Service and Outreach Nationally and Internationally**
- 10. Maintain the Movement**

http://www.ulsf.org/programs_talloires.html

APPENDIX 2: The Earth Charter

PREAMBLE

We stand at a critical moment in Earth's history, a time when humanity must choose its future. As the world becomes increasingly interdependent and fragile, the future at once holds great peril and great promise. To move forward we must recognize that in the midst of a magnificent diversity of cultures and life forms we are one human family and one Earth community with a common destiny.

Earth, Our Home

The Global Situation

The Challenges Ahead

Universal Responsibility

We urgently need a shared vision of basic values to provide an ethical foundation for the emerging world community. Therefore, together in hope we affirm the following interdependent principles for a sustainable way of life as a common standard by which the conduct of all individuals, organizations, businesses, governments, and transnational institutions is to be guided and assessed.

PRINCIPLES

I. RESPECT AND CARE FOR THE COMMUNITY OF LIFE

II. ECOLOGICAL INTEGRITY

III. SOCIAL AND ECONOMIC JUSTICE

IV. DEMOCRACY, NONVIOLENCE, AND PEACE

THE WAY FORWARD

As never before in history, common destiny beckons us to seek a new beginning. Such renewal is the promise of these Earth Charter principles. To fulfill this promise, we must commit ourselves to adopt and promote the values and objectives of the Charter.

This requires a change of mind and heart. It requires a new sense of global interdependence and universal responsibility. We must imaginatively develop and apply the vision of a sustainable way of life locally, nationally, regionally, and globally

http://www.earthcharterinaction.org/2000/10/the_earth_charter.html

APPENDIX 3: International Declarations

The Tbilisi Declaration: One of the most authoritative statements on environmental education – endorsed at the 1977 International Conference on Environmental Education held in Tbilisi (UNESCO-UNEP 1978). The Tbilisi Declaration identified three core goals, six objectives and a set of teacher guiding principles.

Goals:

1. To foster clear awareness of, and concern about, economic, social, political and economic interdependence in urban and rural environments;
2. To provide every person with the opportunities to acquire the knowledge, values, attitudes and commitment and skills needed to protect and improve the environment;
3. To create new patterns of behaviour of individuals, groups and society as a whole towards the environment. (UNESCO-UNEP 1978, p.3).

Six essential objectives:

- | | | |
|----|---------------|---|
| 1. | Awareness | To help students acquire an awareness of, and sensitivity to, the total environment and its allied problems. |
| 2. | Knowledge | To help students gain a variety of experiences within the total environment and develop a basic understanding of the total environment, its associated problems, and humanity's critically responsible presence and role in it. |
| 3. | Attitudes | To help students develop a set of values and feelings of concern for the environment and the motivation to participate actively in environmental improvement and protection |
| 4. | Skills | To help students acquire the skills for identifying, investigating and solving environmental problems. |
| 5. | Participation | To provide students with the understanding, skills and self-esteem, as well as opportunities to be actively involved at all levels in working toward the resolution of environmental problems. (UNESCO-UNEP 1978, p.3). |

Other international declarations: International Association of Universities (IAU) lists 12 international declarations – links and summary sentences for each can be found at:

http://www.unesco.org/iau/sd/sd_declarations.html

These include:

CRE-COPERNICUS (1994), CRE-COPERNICUS DECLARATION

CRE-Copernicus Secretariat, Geneva.

<http://www.iisd.org/educate/declarat/coper.htm>

THE LÜNEBURG DECLARATION on Higher Education for Sustainable Development – adopted on 10 October 2001 in Lüneburg, Germany, on the occasion of the International COPERNICUS Conference “Higher Education-for-sustainability – Towards the World Summit on Sustainable Development (Rio+10)” held at the University of Lüneburg 8 – 10 October 2001.

<http://www.lueneburg-declaration.de/downloads/declaration.htm>

THE HALIFAX DECLARATION

At Halifax, Canada, in December 1991, the specific challenge of environmentally sustainable development was addressed by the presidents of universities from Brazil, Canada, Indonesia, Zimbabwe and elsewhere, as well as by the senior representatives of the International Association of Universities, the United Nations University and the Association of Universities and Colleges of Canada

<http://senate.dal.ca/Files/policies/HalifaxDeclaration.pdf>

GLOBAL HIGHER EDUCATION-FOR-SUSTAINABILITY PARTNERSHIP

(GHESP) - formed between COPERNICUS, the International Association of Universities (IAU), the University Leaders for a Sustainable Future (ULSF) and UNESCO

APPENDIX 4: Millennium Development Goals

At the Millennium Summit in September 2000 the largest gathering of world leaders in history adopted the UN Millennium Declaration, committing their nations to a new global partnership to reduce extreme poverty and setting out a series of time-bound targets, with a deadline of 2015, that have become known as the Millennium Development Goals.

The Millennium Development Goals (MDGs) are the world's time-bound and quantified targets for addressing extreme poverty in its many dimensions-income poverty, hunger, disease, lack of adequate shelter, and exclusion-while promoting gender equality, education, and environmental sustainability. They are also basic human rights-the rights of each person on the planet to health, education, shelter, and security

Goal 1: Eradicate Extreme Hunger and poverty

Goal 2: Achieve Universal Primary Education

Goal 3: Promote Gender Equality and Empower Women

Goal 4: Reduce Child Mortality

Goal 5: Improve Maternal Health

Goal 6: Combat HIV/AIDS; Malaria and other diseases

Goal 7: Ensure Environmental Sustainability

Goal 8: Develop a Global Partnership for Development

The **MDG Monitor** shows how countries are progressing in their efforts to achieve the **Millennium Development Goals (MDGs)**. With the 2015 target date fast approaching, it is more important than ever to understand where the goals are on track, and where additional efforts and support are needed, both globally and at the country level: <http://www.mdgmonitor.org/>

APPENDIX 5: Aotearoa New Zealand University Policy Statements Related To Teaching And Learning For Sustainability: Excerpts From Website Accessible Information

Auckland University: The most sustainability education focused comment is Auckland University's policy section 4, Teaching and research. This statement includes: 4.1 Curriculum

The University will consider the concepts of environmental responsibility and sustainability in education processes and programmes. The commitment to sustainability is an ethical commitment. Education-for-sustainability therefore requires academic staff to consider promoting it where appropriate in their teaching and research. Sustainability should be practised by every member of academic and general staff in each of the areas for which they have responsibility.

This will include efforts to:

Strengthen interdisciplinary programmes about the environment.

Provide universal access and encourage attendance at programmes that enhance environmental awareness for all members of the university staff, students and others.

Evaluate and access all current papers and programmes to determine the need for environmental content in existing papers and programmes and the requirement for new papers and programmes.

Promote environmental education of society in general.

Massey University: The most extensive Environmental Policy, including many references to learning for sustainability, through environmental education.

Environmental Mission Statement

Massey University is committed to the principles of environmental responsibility and sustainable resource management at local, national and international levels. It will meet this commitment through community involvement and leadership in education, research and sustainable management practices.

Policy: General Principles and key concepts

A commitment to the principles of sustainability and to raising environmental awareness, understanding and responsibility throughout the University, the local communities within which its campuses are situated, and in all the wider partnerships and associations beyond the university;

A whole-institution response to environmental responsibility and to sustainability, fostered by wide and continuing consultation;

A commitment to Education-for-sustainability as a life-long process for all, through interdisciplinary and holistic learning programmes;

A commitment to research into environmental issues at local, national and global levels and into the processes of education-for-sustainability.

The above principles define the general concept of environmental responsibility for the University. They also identify the context for three specific areas of responsibility:

1. Education and research for sustainability.
2. Sustainable resource management.
3. Wider community involvement in environmental issues.

Objective: To foster discussion in the University Community of environmental issues:

Ensure that papers and courses at the highest academic level are offered based on the University's environmental expertise;

Encourage Colleges to incorporate environmental topics in internal and extramural papers where appropriate;

Promote sustainable resource management programmes offered by Massey University

Waikato University: an extensive environmental policy that includes several specific references to teaching for sustainability. For example:

Education and Research

Teaching Activities

4. The University promotes environmental issues and sustainability in its teaching activities by:

developing papers and components of papers which have a strong emphasis on interdisciplinary studies and partnerships that are required to address sustainability;

encouraging and supporting staff to incorporate appropriate material on the environment and sustainability into their teaching programmes;•

raising awareness of environmental matters in programmes of staff orientation and development;•

conducting teaching-related activities (eg laboratories and field work) in an environmentally sensitive manner.

Lincoln University: This policy states Lincoln University's commitment to environmental sustainability. It recognises the impact it has on the local, national and global environment. This commitment will be undertaken by the whole university community, in all aspects of the university's activities: research, curricula, extension and facilities management, including all university properties and farms. The University will strive towards environmentally, socially and culturally sensitive and sustainable practice in its use of physical resources, energy and living species. The University will be a leader in environmental sustainability in research, **teaching** and extension at a national and international level.

APPENDIX 6: Ethical Approval

VICTORIA UNIVERSITY OF WELLINGTON

Te Whare Wānanga o te Ūpoko o te Ika a Māui



MEMORANDUM

DATE: November 24, 2004
TO: Pamela Williams
FROM: Dr Allison Kirkman, Convener, Human Ethics Committee
SUBJECT: APPLICATION FOR ETHICAL APPROVAL: No 112.
The contribution of tertiary learning towards developing understanding of sustainable development issues.

Thank you for your application for ethical approval, which has now been considered by the Standing Committee of the Human Ethics Committee.

Your application has been approved and this approval continues until 30 December 2007. If your data collection is not completed by this date you should apply to the Human Ethics Committee for an extension to this approval.

Best wishes with the research.

Allison Kirkman
Convener

APPENDIX 7: Research Information Sheet

VICTORIA UNIVERSITY OF WELLINGTON
Te Whare Wananga o te Upoko o te Ika a Maui



Information Sheet for Research Project:

Towards understanding how tertiary institutions have successfully used processes that enabled the development of cross-disciplinary sustainability-focused undergraduate and graduate programmes.

Researcher: Pam Williams, School of Environmental Sciences,
Victoria University of Wellington, New Zealand.

This research study is designed to contribute to understanding how tertiary institutions have successfully used processes that enabled the development of cross-disciplinary sustainability-focused undergraduate and graduate programmes. The research will be written up as an academic paper and will be presented at conferences, and will inform my PhD thesis on Integrating Education for Sustainable Development into the New Zealand Tertiary Sector. A number of written and audiotape interviews will be conducted with twenty, willing participants from selected tertiary institutions. These interviews will be confidential and comments will not be attributable to any interviewee, unless permission for attribution under a pseudonym has been given in writing. You may withdraw your participation and information up to the start of data analysis. Ethics approval has been given for this research. The research will be regularly reviewed by the PhD supervisor and Victoria University researchers.

For more information contact:

Pam Williams
Research Fellow &
Environmental Education Coordinator
University of Victoria.
Wellington
Ph: 04 463 5527

or: **Dr. Kathryn Sutherland**
Lecturer
University Teaching & Development Centre
University of Victoria
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APPENDIX 8: Participant Consent Form

VICTORIA UNIVERSITY OF WELLINGTON
Te Whare Wananga o te Upoko o te Ika a Maui



CONSENT TO PARTICIPATION IN RESEARCH

Research Project Interview:

This research seeks to establish how tertiary institutions have successfully used processes that enabled the development of cross-disciplinary, sustainability-focused undergraduate and graduate programmes.

- ☐ I have been given and have understood an explanation of this research project and I have had the opportunity to ask questions and have them answered to my satisfaction, before being interviewed.
- ☐ I understand that I may withdraw myself (or information given by me) from this project at any time up to the start of data analysis and that my data will be immediately destroyed.
- ☐ I understand that any information I provide will be kept confidential to the researcher, and her supervisors and the published results will not attribute any opinions to me by name.
- ☐ I am willing to have my opinions published under a pseudonym.
- ☐ I understand the information I have provided will be used only for this research project, which is part of a PhD, and to inform academic articles and conference papers, and any further use will require my written consent.
- ☐ I understand that I will have the opportunity to check the transcript of any interview I consent to, before publication.
- ☐ I understand that when this research is completed all the information obtained will be destroyed.
- ☐ I wish to receive a copy of the results of this completed research.
- ☐ I am willing to be interviewed for this research project.

Signed: _____ Date: _____

Name: _____ Contact: Phone: _____

Contact: Email: _____

APPENDIX 9: Research Interview Sheet

Academic staff interview questions:

- 1) What specific programme(s) for learning for sustainability are you involved in?
- 2) How/why did you become involved in this programme?
- 3) Please tell me what you know about why this programme was developed.
- 4) What academic learning outcomes are intended for students participating in this programme?
- 5) What are the links between this programme and research activities -
Student research
Staff research
Externally funded research?
- 6) What links does this programme have with operational environmental management issues at your institution?
- 7) What feedback have you had about this programme, from
Students
Colleagues
Employers?
- 8) What processes were worked through to enable the development of this and other programmes with a substantive sustainability focus?
(explain if necessary)
- 9) In your view, what processes were the most successful and in what order did they proceed?
- 10) In your view, what are the challenges or barriers, in your institution, to developing more programmes that incorporate learning for sustainability or sustainable development?

APPENDIX 10: Australian Vice-Chancellors Policy on ESD



Australian Vice-Chancellors' Committee

the council of Australia's university presidents

(ACN 008 502 930 - ABN 53 008 502 930)

AVCC Policy on Education for Sustainable Development

The United Nations General Assembly has established 2005-2014 as the United Nations Decade of Education for Sustainability (UN DESD). The goals of UN DESD are to provide every person with the chance to benefit from educational opportunities and to learn the lifestyles, behaviours and values necessary to create a sustainable future.

The Australian Vice-Chancellors' Committee (AVCC) declares a commitment to Education for Sustainable Development, and acknowledges the leading role played by universities in furthering the goals of the UN DESD. By 2020, the university sector in Australia will be playing a key role in promoting sustainability in the community through research and building capacity to achieve change for sustainability. Universities will demonstrate through their campus management and administrative practices how sustainability can be implemented and how it can result in economic, social and environmental benefits.

The AVCC will strive to ensure that Higher Education in Australia is acknowledged as a major driver to society's efforts to achieve sustainability. This will be achieved through the skills and knowledge of its staff and students and through its engagement with communities. The AVCC will further promote sustainability by supporting its members and through the creation of strategic linkages with government.

In the knowledge economy the AVCC, the council of Australia's University Presidents, will take a leadership role in the articulation, promotion and the building of a consensus of values, attitudes and lifestyles for sustainability.

The AVCC encourages its members to:

- create an appropriate institutional culture of sustainable development through benchmarking and the sharing of good practice;
- build capacity in the community by educating the next generation of professionals and leaders to become fully aware of sustainability:
 - for students, consider embedding elements of sustainability at appropriate levels in academic programs;
 - for staff, consider implementing Professional Development programs on sustainability themes;
- have a clearly enunciated policy on sustainable development for all capital works, including the building of new as well as the refurbishment of existing infrastructure;
- engage with schools, industry and communities in partnership and projects which promote sustainable development; and
- undertake research which will strengthen sustainable development and education for sustainable development.

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