A critique of academic development in sustainability for tertiary educators

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Declaration

This is to certify that:

• Except where due acknowledgement has been made in the Preface, the work presented in this thesis is my own.

• The work has not been submitted previously, in whole or in part, to qualify for any other academic award.

• The content of the thesis is the result of work which has been carried out since the official commencement date of the approved research program.

• Any editorial work, paid or unpaid, carried out by a third party is acknowledged.

• Ethics procedures and guidelines have been followed.

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Sarah Holdsworth

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Date
Preface

The work presented here was completed for this thesis and is predominantly my own. Publications and contributions from others are detailed below.

The work presented in Chapter 2 is based on the following paper:


All co-authors provided editorial assistance.

The work presented in Chapter 5 is based on the following papers:


All co-authors provided editorial assistance.

This thesis has been professionally edited by Gill Gartlan from red dog productions, in accordance with Standard D, Language and Illustrations, and Standard E, Completeness and Consistency, of the Australian Standards for Editing Practice.
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I believe in lifelong learning and that we each have the responsibility to pass on knowledge when we think it is of value. These beliefs were instilled in me from a very young age by my grandfather, who recognised that, as individuals we can make a small difference, but collectively, a significant difference. As a society we are currently unable to recognise the impact that our social constructions have on the natural environment and the communities we live in. Sustainability and sustainability education are urgent priorities, as education, in the words of my grandfather, ‘provides you with possibilities, power and opportunity’. It is my hope that the outcomes of this research will provide guidance and clarity for us all in the pursuit of sustainability educational praxis – or simply, better educational praxis.

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Abstract

Current global trends provide qualitative and quantitative evidence of a world in crisis, describing the decline of our environmental and social systems. This situation is reinforced by an education system that educates for, and reinforces, this dominant world paradigm (UNEP 2002a).

A dramatic change in our mindset and behaviour is required if this is to change, and education is seen as a means of addressing and resolving these environmental and social crises. However, current approaches to education are more aligned to educational practice than to praxis and are not necessarily the best models to achieve this transformative change. Sustainability education has been advocated as one way of achieving what is required. Education founded on a sustainability paradigm differs from traditional approaches to education in its structure, content and pedagogy. It aims to develop skills and competencies that will allow students to critically and systematically think about problems, explore complexity, and examine and reflect on their own ways of knowing and the implications these have for developing a more sustainable way of being (Sterling 2001).

Despite international calls for sustainability education, and the arguments for a transformation of education, the principles of sustainability education have not yet been integrated into mainstream curricula. This is especially critical in universities, as they have a responsibility to lead society towards a sustainable future, as they operate within a broad societal context and have the potential to contribute to social dynamism, economic security and environmental sustainability of the communities within which they operate. Despite growing demand from students, employers and the university community, universities have been slow to implement sustainability policy and practice, especially in the area of learning and teaching.

Academic development is a key way to create change in academic learning and teaching praxis; we need academic development programs that are effective and
efficient in facilitating sustainability education within universities. Currently there is a lack of support for the training, time and recognition from peers that would legitimise sustainability within universities.

While curriculum change itself has begun to receive much attention, there needs to be greater understanding of praxis – pedagogy, approaches to learning and teaching and curriculum development – relating to academic development that will promote sustainability. This thesis investigates how sustainability education is currently being implemented within universities and how we currently prepare our tertiary educators to teach and challenge students. Specifically, it identifies the requirements of academic development programs which will provide educators with the capabilities to deliver sustainability education. In order to determine what an ideal academic development program for sustainability education would look like, a theoretical framework was developed from an analysis of the literature in the following three areas: sustainability education, academic development and organisational change within universities. Three international case studies in which alternative approaches to academic development in sustainability have been implemented are critically evaluated against the three themes identified in the framework. The results of the case studies are used to ‘ground’ the framework, and identify the features of academic development programs that are most likely to result in lasting change for sustainability. These features include:

- placing sustainability education praxis as the central goal of any academic development program
- allowing flexible definitions of sustainability to facilitate the role of disciplinary and personal experience in their construction
- acknowledging the need to explore the way an educator’s own worldview shapes their educational practice and aiming to achieve deep learning (‘third-order’ learning) to bring about a shift of consciousness and changes in behaviour and professional practice
- building on the following four phases so that educators are able to teach in a way that achieves third-order learning:
− confrontation: recognising that change is required in current practice

− developing self-awareness: recognising one’s own practice

− recognising the availability of alternative approaches

− building commitment to a new conception

• providing the opportunity for those developing and delivering academic development programs to continually develop their own pedagogy

• leading academic development from the ‘top down’ and ‘bottom up’ and identifying and supporting (financially and collegially) drivers of change.

• understanding that universities have a distinctive dominant culture because of their complex social organisation so that the occurrence of cultural conflict is minimised and the development of shared goals is fostered

• giving intensive and personalised support to those undertaking change; providing tool kits without facilitation will not lead to changes in curriculum or educational practice.

The findings of this research are transferable to universities around the world, as well as to other institutions aiming to develop academic development programs in sustainability.
1 Introduction

Education which fails to clarify our central convictions is mere training or indulgence. For it is our central convictions that are in disorder, and, as long as the present anti-metaphysical temper persists, the disorder will grow worse. Education, far from ranking as [our] greatest resource, will then be an agent of destruction.

EF Schumacher, Small is beautiful: Economics as if people mattered, p. 94

1.1 Education and society

Western society today is shaped by the social and political constructs of a neo-liberal capitalistic society where the wealth of nations and the optimal play of market forces dominate social and political agendas (Gough & Stables 2008; Stibbe & Luna 2009; UNEP 2002). Industrial, scientific and technological revolutions have caused severe and in some instances permanent damage to our environment and our social systems. The resulting economic polarisation and ecological devastation inevitably flow from an economic system based on false prices (Stibbe & Luna 2009; UNEP 2002). This situation is bolstered by an education system that reinforces this dominant world paradigm (UNEP 2002).

A more sustainable future requires transformative change so that, as empowered and engaged citizens, we can critically think and reflect on our current lifestyles and act individually and collectively to allow for action that results in positive environmental and social change (Fien et al. 2004). Education underpinned by a sustainability paradigm is advocated as one way of decreasing the current disconnection between humans and the natural environment (Schumacher 1973; Sterling 1996). This form of education challenges the rationality of the capitalist neo-liberal capitalistic paradigm (Orr 2001).

For nearly twenty years, through international conferences, publications and commitments, there has been increasing activity in moving towards the inclusion of environmental understanding and sustainability in universities. The first formal
recognition of the role of education for sustainability was the development of the Talloires Declaration of University Leaders for a Sustainable Future, in October 1990, followed by the Halifax Action Plan for Universities of the ‘Creating as Common Future’ conference in December 1991. A key outcome of the 1992 Rio Earth Summit was the recognition of role of education in sustainable development with the inclusion of Chapter 36, ‘Promoting Education, Public Awareness and Training’, in Agenda 21. This work has continued with the development of several other initiatives, including:

- Copernicus University Charter for Sustainable Development of the Conference of European Rectors, Autumn 1993
- Kyoto Declaration of the International Association of Universities, November 1993
- Student Charter for a Sustainable Future of the student unions of the United Kingdom, July 1995 (ULSF 2001).

In 2002 the World Summit on Sustainable Development (WSSD) in Johannesburg reconfirmed and promoted the need to reorientate the role of education within the sustainability agenda (Lang 2004). Most recently the declaration of a United Nations Decade of Education for Sustainable Development, starting in 2005, has reinforced the significant contributions of education to sustainability.

Education of this kind requires a new pedagogy which sees learners developing skills and competencies for partnership, participation and action, and where individuals develop skills to critically enquire and systematically think about problems in ways that allow them to explore the complexities and implications of a more sustainable way of being (Fien 2001). This is particularly important in universities as ‘universities train most of the world’s managers, decision-makers and teachers’ and ‘play significant roles in national and global economies’ (Bekessy et al. 2003, p. 1). Since the 1970s, the number of university students in the world has increased by more than 300 per cent (Wolf 2002), making the role of higher education central to the development of our future in all sectors of society. Many argue that, despite having this significant role, universities are failing to provide the leadership and education needed for society to move in a sustainable direction (Fien 2001; Jucker 2002a, 2002b; Orr 2001; Scott 2002; Shephard 2008; Sprignett 2005; Sterling 1996; Thomas 2004).
Educators in universities are rarely aware of the way ethics and values underpin and inform their educational practice, including teaching practice (pedagogy and method) and curriculum development (content), and they rarely consider the profound impact that they have on the personal and professional lives of their students (Fien 2001; Jucker 2002a, 2002b; Orr 2001; Parkin, Johnson, Buckland & White 2004; Scott 2002; Shephard 2008; Sprignett 2005; Sterling 1996; Thomas 2004). Many tertiary educators do not understand what skills their students need to operate as sustainability literate professionals (Scott & Gough 2004; Sterling & Thomas 2006) and lack the pedagogy necessary to educate in a manner compatible with sustainability education (Sterling 2004). If new conceptualisations of education, such as education for sustainability, are to become embedded in practice within universities, academic development for academics will be required (Dawe, Jucker & Martin 2005; Sibbel 2009; Tilbury et al. 2005). Despite commitments to academic staff training and development featuring prominently in many of the declarations universities have made towards sustainability, there is little evidence of universities supporting this type of academic development. While curriculum change itself has begun to receive much attention in the field of education for sustainability, the area of academic development needs greater understanding regarding pedagogy, program content and structure (Garci´a et al 2008; Sibbel 2009).

1.2 Research problem

While the literature to date has focused on setting an international agenda for the integration of sustainability into public education, and offers principles that could form the foundations of education for sustainability, there has been little research into ways of implementing these principles. Despite demand from students and employers, and growing support across the university community for pedagogy, improved teaching methods and curricula focusing on sustainability, these principles are far from being integrated into mainstream practice (Bekessy et al. 2003). In his article ‘Dealing with misconception on the concept of sustainability’, Filho (2000, pp. 14–15) argues that sustainability is often resisted within organisations because:

1 It is considered too broad and abstract.
2 Individuals within organisations are not trained to handle it.

3 The amount of resources needed is not considered to be justified.

4 The theme is not considered to have a scientific basis.

In 2005 Dawe, Jucker and Martin undertook a literature review of current practice of teaching sustainable development in the UK. They identified the following barriers to embedding education for sustainable development within higher education institutions, similar to the findings of Filho (2000):

- Curriculum too crowded and lack of time to update courses.
- Perceived irrelevance by staff and awkward fit with subject area.
- Lack of staff expertise and the need to acquire new knowledge.
- Lack of institutional drive and commitment.
- Lack of staff awareness (Dawe, Jucker & Martin 2005, p. 35).

A further challenge is posed by academic identity, both individual and collective, which is shaped by disciplinary origins, culture, values and beliefs. These create cultural scripts which guide teacher and learner behaviour (García et al. 2008; Hegarty 2008; Shephard 2008); they are often not consciously recognised and questioned, perpetuating approaches to education that are at odds with sustainability. These must be considered and addressed when thinking about reframing curricula and operational activities from a sustainability perspective if change is to occur. This is especially important as these unwritten codes of classroom conduct are pervasive and influential, making it very difficult to effect change (Chappell 2007; Stenhouse 1975).

The use of academic development to create change in academic learning and teaching practice is important, as knowledge of pedagogic theory and the support of peers provides educators with the confidence to attempt a shift from conventional teaching and learning practice (Chappell 2007; García et al. 2008). However, academic development programs have yet to be explored in depth as a mechanism for initiating a change of consciousness in favour of sustainability. This is reflected in the lack of training and implementation of successful initiatives, and there is currently very little support in terms of time and recognition from peers that would legitimise sustainability within universities.
There is also very little in the way of research and guidance in the area of academic development in sustainability for tertiary educators (García et al. 2008; Sibbel 2009). This is of concern, given that educators play a primary role in developing and presenting the values associated with sustainability defined by their own ideological and conceptual frameworks. These frameworks define the criteria by which different kinds of knowing are valued by the educators themselves and by different disciplines. An investigation and critique of the best ways to develop academic development in sustainability for tertiary educators will provide critical information to universities aiming to embed sustainability in the curriculum.

This research will explore the need for alternative practice in delivering sustainability education within universities. Generally, it will investigate how we prepare our tertiary educators to teach and challenge students. Specifically, it will identify the requirements of academic development programs to provide educators with the skills to engage students with the ideas of sustainability. The research will present a critical review of alternative approaches to academic development in sustainability for tertiary educators, using three international case studies. These areas of inquiry will inform the development of a framework for academic development programs for education underpinned by a sustainability paradigm.

1.3 Research significance

Universities prepare many of the world’s future leaders and professionals (Bekessy et al. 2003). The Association of University Leaders for a Sustainable Future (ULSF 2002) argues that, as in business and industry, the success of higher education in the twenty-first century may be judged mainly by the extent to which sustainability becomes a cornerstone of academic practice. However, universities have been slow to implement sustainable development into their teaching and learning practice (Thomas 2004). As a result, most graduates remain poorly prepared to integrate the economic, environmental, cultural and social dimensions of sustainability into their professions or to see the opportunities or potential benefits of implementing sustainable practices in the workplace. Equally, graduates often do not gain the associated generic capabilities of effective communication, problem solving, analysis, team work, flexibility and
adaptability that are sought by employers (Thomas & Nicita 2003) and which are key outcomes of a sustainability-focused education (Fien 2002).

The process required to successfully embed significant curriculum change across the range of disciples at universities is complex and poorly understood. Mechanisms for curriculum change require understandings of organisational culture (Eckel & Kezar 2003) and of the role that dialogue and sense-making (Weick 1995), staff politics (Arnold & Civian 1997; García et al 2008) and external factors play in creating change. This research seeks to understand how academic development can act as the vehicle for institutional change for sustainability where change results in the following areas of educational praxis:

- **Curriculum**: developing *course materials* that facilitate graduates’ understanding of sustainability as a transformative concept, rather than reinforcing the dominant world paradigm.

- **Learning and teaching**: developing *teaching methods* that facilitate understandings of sustainability as a transformative concept, i.e. reflective practice, self-evaluation (Schön 1983).

- **Pedagogy**: developing *educational approaches* that shift recognised disciplinary boundaries. Blättel-Mink and Kastenholz (2005) argue that overcoming disciplinary limitations and abandoning the epistemological security of one’s own discipline is extremely complicated and requires educators to overcome insecurity concerning the research object, and insecurity concerning one’s own identity and professional future.

This research has focused on the most appropriate ways to interpret and present sustainability in curricula, to engage with staff through academic development programs and to achieve wider organisational change within universities. The outcome of this research is a framework to inform academic development programs for tertiary educators that will result in sustainability education courses and programs within higher education. This framework has been informed by a critique of three case studies of academic development programs, which have different structures and curricula.
1.4 Research aim, questions and phases

The aim of this research was to develop a framework for academic development (AD) programs in universities that are more likely to result in lasting change for sustainability. The overarching research question is: How should academic development programs in universities be designed to support the delivery of sustainability education?

The research was conducted in four phases:

- **Phase 1: Conceptualisation of a theoretical framework**

  There are very few academic development programs currently operating globally, and those that do exist are still in their infancy. In order to determine what an ideal academic development program for sustainability education would look like, a ‘theoretical framework’ was constructed, based on literature in the areas of sustainability education, academic development and organisational change.

- **Phase 2: Case studies of known best practice in academic development for higher education and sustainability**

  The ‘theoretical framework’ developed in Phase 1 was grounded in three international case studies in which alternative approaches to academic development in sustainability were critically evaluated. The case studies were examined in terms of their interpretation of sustainability education, their approaches to academic development and their ability to achieve wider organisational change within universities.

- **Phase 3: Grounding the theoretical framework in the real world**

  The results of the case studies were used to ground the ‘theoretical framework’, to identify the features of academic development programs in sustainability education.

- **Phase 4: Synthesis**

  Based on the theory presented in the first phase and the findings from the case studies a ‘best practice framework’ was developed to guide future academic development programs in universities.
1.5 Terminology

There are many terms used to describe education underpinned by a sustainability paradigm: ‘education about sustainability’, ‘education about sustainable development’, ‘education for sustainable development’, ‘education for sustainability’, ‘sustainability education’ and ‘sustainable education’. These terms represent the assumptions and epistemological positions of the authors. How an individual interprets, values and embeds elements of sustainability education will be determined by their understanding of their own theoretical frameworks, the influence of disciplinary practice, the culture of the organisation and respect for other perspectives. For sustainability education praxis to occur there needs to be a recognised link between the ongoing reflections by the educator on their own pedagogy, on how it informs their learning and teaching practice in the classroom and how it shapes their curriculum. I have chosen the term ‘sustainable education’ to characterise the type of education I believe is required, that which Sterling (2001) describes as third-order learning: education that is transformative, epistemic and results in a change in behaviour. Where I use other terms in this thesis, it reflects the preferred terminology of the authors I am discussing, which indicates their underpinning assumptions.

1.6 Rationale for research

The rationale for the thesis topic, academic development in sustainability education, emerges from my experience teaching undergraduate courses in environmental policy, management and sustainability over the past six years at RMIT. It is my belief that if we are to develop graduates with the skills and abilities to solve complex, multidisciplinary problems, within their professional and personal lives, a new approach to educational praxis is required. Central to this is in need for current and future academic staff to undertake academic development in the area of sustainability education. Academic development is required if we are to improve not only curriculum content, but also the approach taken to pedagogy and learning and teaching.

The approach to learning and teaching required to develop such graduates is predicated on six years of my own learning and teaching experience. This has allowed me to observe a range of approaches to sustainability education and to develop my own
approach based on my experience within the classroom. To this point my approach to teaching and learning is predicated on the development of a generic transferable skill set, required for active learning, regardless of the discipline or subject. The development of content is then structured and presented in a way that develops these generic skills while reflecting the learning objectives of the discipline and subject matter. This approach provides students with the skills, content, and awareness to ‘see’ differently and hopefully provide them with the courage and ability to alter/change/or at the very least to understand their own way of being.

Transferable skills that I develop in my students are those inherent to life-long learning, and include reflective practice, critical thinking, and systemic thinking. I believe that all education requires learners to critically reflect on their own values if they are to be able to align their behaviours with the knowledge they acquire through the formal educational experience. This requires students to explore unexamined conceptions and assumptions that have evolved over their entire formal and informal educational experience. Reflective practice, critical and systemic thinking allow students to identify and understand their own worldview, and then to reflect on this as it relates to the content that is being presented in the classroom. The explicit purpose of this practice is to enable students to develop new knowledge, not just to provide them with facts and theories about a particular subject matter.

The content of a sustainability subject must reflect that environmental solutions alone are inadequate; that sustainability also requires improvements to economy and society if change is to occur. While, most students recognize that there are issues that need to be addressed. What is missing is the ability to identify how they fit into the cause and the solution of these problems. Sustainability as a concept, given its complexity and multiple interpretations, must be place into a framework that students can engage with. This framework is one that allows them to identify their own world-view, recognizes other world-views, and to then be able to articulate the differences between them. Consequently, I describe sustainability as being made up of three elements the social, the environment, and the economy all inherently linked. I use this framework to illustrate all the content discussed in class as they relate to sustainability as a concept. Using this approach, it is possible to visualize and discuss how different values, perspective, and
world-views result in different outcomes. This does not just specifically relate to sustainability subjects, but can be use in any subject/discipline areas to understand how decision and policies are made what assumption underpin these, and how alternative outcomes can be achieved.

It is critical to any discussion on worldview to recognize that an individual’s worldview has been shaped by a lifetime of experience, and is underpinned by their values. This allows for the exploration of how our experience and values translate into actions, both personally and professionally. My approach to teaching aims to ensure that my students understand the social constructions that exist within society, and these determine and inform their conscious or unconscious actions and decisions. I hope that in exploring this across many of our social systems we are able to identify the values that underpin these structures and then to deconstruct these. This allows students to identify if these are consistent with their own values and resultant decisions. It is my hope that students will begin to recognize why the underlying values of society need to change and how difficult this can be.

It is important to recognize that in any discussion that asks student to think about their values and perception of the world also requires the educator to undergo the same process. There is no such thing as ‘value-free’ education, especially when it comes to sustainability education; I ensure that I constantly articulate that my discussion and teaching stem from my own world-view. I encourage students to identify and question my views, assumptions, and values and articulate how and why mine differ from theirs. It is also important to recognize the tensions between the social, economic, and environmental, and that there is not always a situation where equity across all areas can be achieved in seeking a sustainable solution. This necessitates the recognition that my life is full of contradictions and that I am constantly working through these. This is an attempt to minimize moralizing and judgments to create a learning atmosphere of trust, where students can move out of their comfort zones, and challenge each other constructively learning in the process.

My goal with any of my teaching is to develop students who are able to recognize their view of the world, how it differs with others, and why. Equally, I seek to nurture students who recognize the applicability and importance of sustainability criteria in their personal
and professional lives, and to create value in the development of knowledge rather than accumulating quickly forgotten facts and theories. In order to do this I have developed a set of principles that I embody in all of my classes they are

1. Any content presented must have a contextual setting primarily locally or at least nationally. Students are required to think about how course content is currently being applied to real world setting and to think about how different decision would effect different stakeholder groups. Students are challenged to think about the values and worldviews associated with different decisions and initiative preparing them for similar situations in their future professional lives.

2. Students must engage personally with the material so that they have a literal understanding of the outcome of the application of that/their knowledge.

3. Develop a co-operative, active learning environment (rather than a traditional lecture format). Teaching sustainability needs to reflect the principles of sustainability students need to be challenged and encouraged to take responsibility for their own learning. My teaching focuses more on facilitating rather than lecturing, and ensuring appropriate style of discussion are developed, and that all are able to constructively participate.

Finally as an educator, I must constantly reflect on my own understanding of sustainability, pedagogy, and teaching methods. Improving teaching and learning practice requires teachers considering themselves as active learners who recognize they construct their own understanding of knowledge. This is especially important for those engaging in sustainability education; given that the sustainability paradigm is contested and open to epistemological interpretations. Reflection is an essential ingredient of the learning process and that unless lecturers engage in critical reflection and ongoing discovery, they stay trapped in unexamined judgments, interpretations, assumptions, and expectations. Reflective practice enables lecturers to compare their teaching against their own experience highlight differences between theory and practice, with the reflective process thus becoming a means of re-conceptualization.

Recognizing my own world view, indirectly, I would hope that having experience my classes students’ worldview would become aligned to one in which they will become
individuals who embody some of the principle that they experience, whether in the civic sphere or by bringing sustainability criteria to bear on their work (whatever their profession) or even better both. However if they believe that they have truly learnt something new or developed new knowledge I consider I have achieve my ultimate goal.

1.7 Structure and outline of thesis

Chapter 1 provides an overview of the thesis. Chapter 2 presents a literature review, which overviews key debates on the role and best practice of education for sustainability, academic development and organisational change in universities. The review seeks to identify, theoretically, what is required of an academic development program to ensure it is successful in creating transformational change in teaching and learning and curriculum development. This led to the development of a theoretical framework for ‘Sustainable Education Academic Development’, which was tested in three case studies.

Chapter 3 presents the epistemological and ontological positioning of the thesis and outlines the case study methodology used, including the assumptions I brought to the research. I discuss the rationale behind the selection of case studies. Details of my methodology, the theoretical underpinnings, and the processes of analysis that led to my finding are described in detail. The ethical implications of my research are also identified in this chapter.

Chapter 4, 5 and 6 present my case studies.

Chapter 7 grounds the theoretical framework in real-world experience (the case studies). This chapter identifies the key elements of academic development programs for sustainability education that are more likely to result in lasting change for sustainability in universities.

Chapter 8 presents my conclusions and explores the implications of the findings for universities.

Appendices provide background and supporting material.
1.8 Summary

There has been a strong focus on setting an international agenda for the integration of sustainability into public education and the development of principles that could form the foundations of sustainability education, yet there has been little research on ways of implementing these principles. Academic development programs have yet to be explored in depth as a mechanism for initiating a change of consciousness in favour of sustainable development. This research is significant given the lack of research and critique of existing academic development programs in sustainability education. The findings of this research will be transferable to universities around the world as well as other institutions aiming to develop academic development programs in sustainability. This research has implications not only for universities but also within professional practice. If we understand how to create lasting change that promotes education for sustainability we will begin to build capacity for graduating professionals to better meet the documented demand from a wide range of employers and professional organisations.
2 Literature review

2.1 Education, the dominant Western paradigm and its role in shaping society

It has been argued that we are living in the Anthropocene Epoch. This is a time when humans dominate the Earth at a rate and scale that is unprecedented and has resulted in significant changes in the natural systems of the biosphere. Population growth and our lifestyle choices challenge our ability to live within the Earth’s carrying capacity, threatening the planet’s natural biodiversity, water, energy and food security, as well as its ability to repair itself given the amount of pollution we create (Bell 1994; Brundtland 1987; Cortese 2003; Lowe 2008; OECD 2003; Porritt 1991; Stibbe & Luna 2009; UNEP 2002, 2003, 2005). This suggests that our current behaviours threaten our ability to achieve the goal of meeting ‘the needs of the present generation without compromising the ability of future generations to meet their own needs’ (Brundtland 1987, p. 8). This goal will become less achievable without a dramatic change in our mindset and behaviours, and formal education is one tool that shapes and informs how we think and act (Cortese 2003).

Modern Western society, its structure and its culture are founded on the concept of cumulative knowledge and belief, passed on to generations primarily through formal education (Clinton 2006). As a society we inherently believe in the value of education and the resultant capabilities that perpetuate social and technological improvement (Clinton 2006). Kemmis (2008b) describes education as having two roles: (a) the development of individuals, and (b) the development of society. Kemmis (2008b) believes that education as it relates to the individual is in the interests of the learner and the development of their self-development, self-expression and self-determination. Education as it relates to the development of society is in the interests of the good for humankind – in the interests of 'self-development, self-expression and self-determination' (Kemmis 2008b, p. 22) of the various social and political collectives in which we live our lives. Consequently, education has the moral, social and political
purpose to develop not only good people, but also good societies (Kemmis 2008b).
Kemmis (2008a) argues that ‘the double purpose of education follows a long tradition in
the discussion of Education, echoed by the centuries-long European tradition of

As a consequence it can be assumed that the role of education in society is an ethical
consideration, and that it is more than the forcing of accepted knowledge on students
(Huckle 2005). Education guides the development of an understanding of the world, the
ability to reason and the growth of character and personality (Clinton 2006). Stahl (2004,
p. 137) argues that ‘If morality consists of the factual norms that we follow to facilitate
social life, then the first goal of education is to give students the moral “drill” they need’.
Stahl believes that this moral ‘drill’, or ability to reason morally, is learnt through a
sequence of stages initiated by education, and that there is opportunity to reflect on the
morality and ethics that underpin and inform educational praxis.

In today’s formal modern Western education system there is very little reflection of the
morality and ethic that underpins education (Henn & Andrews 1997; Huckle 2005;
Murray & Murray 2007). Henn & Andrew (1997) argue that education is today is
dominated by teaching facts: teaching learners what to think, founded primarily on what
it is that their peers and the educators ‘think they know and know they believe
(indoctrination)’ (Henn & Andrew 1997). Strachen argues that

‘The formal education experience of most learners could be summarised as moving from a
multidisciplinary approach in their early years, grounded in their limited experience of the world,
through to an increasingly reductionist experience in which they become more specialised and less
prepared for the interconnected complexity of the world in which they have to live and work.’
(Strachen 2009, p 84)

Orr (2001) and Jucker (2002a) argue that the goal of this kind of education is often
misinterpreted as preparing young people for careers that construct our global economy,
focusing on performance standards and testing, rather than encouraging critical thinking,
creativity and ecological awareness. Education is merely training individuals to think and
act with individual benefits as a focus for reinforcing the dominant social paradigm
(Kemmis & Fitzclarence 1996; Sprignett 2005). Additionally, this has resulted in educators who are unable to make a distinction between ‘education’, with individual and social purpose, and ‘schooling’, which is the institutional formation of learners to attain approved learning outcomes; which may or may not be in the interests of the students themselves or the good of humankind (Kemmis 2008b). Educators of this kind are unable to identify related distinctions between indoctrination and education (Kemmis 2008b).

Underpinning this lack of understanding of education is the loss of the traditions of educational study and philosophy and theory, and the tradition of Pedagogik (Kemmis 2008b). Historically, the double purpose of education as discussed by Kemmis (2008b) sought to consistently refine and educate for the development of a “good person” and an “educated person” in the interests of the individual and the interests of humankind’ (Kemmis 2008b, p. 29). Understandings of these terms were not finite, but reflective, and required continual questioning about what ‘society’ should look like, which was open for consideration within every society. Kemmis (2008) argues that these questions ‘cannot be closed once and for all by the answers given in any particular time or place’ (2008a, p. 29). The education tradition is ‘to continually review and revise past answers in the light of changed historical times, and changed social circumstances’ (Kemmis 2009, p. 29); it requires ongoing interpretive analysis of the present using the knowledge gained from previous experience.

The loss of this educational approached describe by Kemmis (2008, 2009, 2010) has been attributed to the dominant scientific Western worldview, which penetrates and shapes all areas of our society (Capra 1975; Kemmis 2008b; Kemmis & Fitzclarence 1996; Orr 1994; Robottom & Hart 1993; Sterling 1996). Our worldview characterises how we view the world, how we view and interpret realities in a meaningful way, how we act, the questions we choose to ask, the way we go about seeking answers, and how we interpret the answers and the significance we attach to them (Bawden 1997; Robottom & Hart 1993). The scientific worldview developed from the scientific revolution during the 17th and 18th centuries, and separated the physical from the metaphysical (spiritual) world, developing the following dichotomies: body and mind, fact and reason, knowledge and values (Robottom & Hart 1993). This scientific worldview can be
characterised as a paradigm (positivism) that regards the world as a mechanical system, the body as a machine, and argues that unlimited progress is achieved through economic and technological growth (Capra 1988). Robottom and Hart (1993, p. 29) argue that this worldview has a strong empiricist quality ‘which assumes that the only valid knowledge … obtained through the scientific method … is objective, rational and true’, and that this is the only rational way to develop knowledge.

Kemmis (2008b), Orr (2001), Robottom & Hart (1993) and Sterling (1996) believe this scientific worldview dominates the field of formal education, and is then reflected in our ‘educated’ society (Fricker 1998). This positivist approach seeks ‘to apply the standards and methods of the natural sciences to the problems of education’ (Robottom & Hart 1993, p. 29). Kemmis (2009) argues that positivist approaches to educational thinking have legitimised the idea of the development of finite answers to the questions raised by the tradition of Pedagogik, and therefore act to conserve existing institutional structures across all sectors of society, including the field of education (see also Codd 1982; Kemmis 2008b). This kind of thinking is a direct product of the dominant motives and interests of a Western worldview: efficiency, effectiveness and productivity. Robottom and Hart argue that positivistic approaches to education have bureaucratic appeal guaranteeing ‘discipline in the workplace and contribut[ing] to a growing gulf between those who conceptualise tasks and those who execute them’ (1993, p. 30). Education of this nature does not enable the development of skills or the ability for individuals to recognise the dominant ideology. Jucker 2002a concludes that in its current conceptualisation Western education has been successful in reinforcing an understanding of what is unsustainable rather than what is sustainable.

However, dominance of the scientific worldview in formal education is under increasing scrutiny. According to Capra (1982), it is no longer a sufficient model of reality. Kuhn (1970) and Huckle (2005) suggest that new ways of thinking need to emerge so that we are able to explain and question our own worldviews and models of thinking, allowing deep reflection on personal and societal value positions. This is critical, as ‘… meaning is a property which is emergent in both individuals and communities through the interactions of different ways of knowing’ (Bawden 1997, p. 4). Lazlo (2006) and Robottom & Hart believe a new philosophical and conceptual framework (a new
worldview) is emerging, one where ‘new social, ethical, ecological, epistemological and ontological problems’ are included (Robottom & Hart 1993, p. 34).

The challenge for educators is to bring about and empower a change in attitude and behaviour. This can only occur if ethics and values are reinstituted into education and if learners are provided with the skills to critically reflect on and question the implications of their decisions (Fricker 1998; Henn & Andrews 1997). This has been reflected in the many calls for alternative approaches, such as environmental education, global education, development education, peace education, citizenship education, human rights education and multicultural education (Fien et al. 2004; Gough, A 1997). The policy statements from the international conferences on environmental education held at Belgrade in 1975 and Tbilisi in 1977 established environmental education as a goal that should be pursued within all areas of education (Gough, A 1997; Stevenson 1987). The goals and objectives of environmental education are to alleviate exploitation of the environment through social construction, to avoid the social injustices in the process of that reconstruction and to strengthen and encourage independent communities, locally and globally (Pace 1996; Robottom & Hart 1993). These goals create tension and conflict because they challenge the dominant worldview with a different values system (Gough, A 1997).

Some authors argue that environmental education, in its conceptualisation, has failed to achieve its goals, as it is currently dominated by an underlying research paradigm, characterised by the scientific worldview (Robottom & Hart 1993; Gough, N 1987). Part of the problem stems from a lack of understanding by practitioners and researchers of the different assumptions that inform their own practice and the practice of others, and the lack of ability to identify and address inconsistencies and contradictions in their professional and personal lives (Robottom & Hart 1993; Selby 2006). Kemmis (2008b) argues that educators and teachers develop into the educators and teachers they are by complying with the underpinning worldview, and by not resisting the particular practice architectures1 in which they live and work. Kemmis (2008b) argues that if we want

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1 Practice architectures describe the cultural structures that result from our practices and relationships. Practice architecture results from the way we communicate, relate and act towards each other. These tacit understandings predetermine what future practice/praxis will be possible within a defined system. Only by understanding the practice architectures in place can we change (Kemmis & Grootenboer 2008).
different kinds of education from that currently practised in society today we must also change the practice architectures that construct action, possibilities, self-understandings and understandings of the world. Education underpinned by a sustainability paradigm has evolved to bridge the gap, aspiring to integrate social, economic, political and environmental issues.

### 2.2 A sustainability education paradigm and universities

The call for education for sustainable development was given prominence at the United Nations Conference on Environment and Development in Rio de Janeiro in 1992, with the inclusion of Chapter 36, ‘Promoting education, public awareness and training’, in Agenda 21, where it was stated that counties should ‘Set up training programmes for school and university graduates to help them achieve sustainable livelihoods’ (UNESCO 2004b).

In 1997, in their ‘Rio + 5’ report, UNESCO called on governments to strengthen their efforts and urged them to recognise that:

- The core themes of education for sustainability include lifelong learning, interdisciplinary education partnerships, multicultural education and empowerment.

- Special attention should be paid to the training of teachers, youth leaders and other educators.

- Even in countries with strong education systems, there is a need to reorient education and training so as to promote widespread public understanding, critical analysis and support for sustainable development (UNESCO 1997, paragraphs 105–6).

The World Summit on Sustainable Development in Johannesburg in 2002 confirmed and promoted the need to reorientate the role of education within the sustainability agenda (Lang 2004). As a consequence of this and other UN conferences, the UN launched the Decade of Education for Sustainable Development (DESD) from 2005 to 2014. The focus the DESD is to have all educators include sustainable development concerns and goals in their curriculum (UNESCO 2004b).

The Director General of UNESCO, Koichiro Matsuura, stated that
Education – in all its forms and at all levels – is not only an end in itself but is also one of the most powerful instruments we have for bringing about the changes required to achieve sustainable development (UNESCO 2004a, p. 8).


ESD is for everyone, at whatever stage of life they are. It takes place, therefore, within a perspective of lifelong learning, engaging all possible learning spaces, formal, non-formal and informal, from early childhood to adult life. ESD calls for a re-orientation of educational approaches – curriculum and content, pedagogy and examinations (UNESCO 2005, p. 7).

Education founded on a sustainable development paradigm aims to develop skills and competencies that will allow students to seek out and examine their own frameworks for thinking (Cortese 2003; Holdsworth et al. 2006a; Huckle 2005; Lang 2004; Shephard 2008). The objective is for students to develop skills to critically enquire and systematically think about problems in ways that allow them to explore the complexity and implications of a more sustainable way of being (Sterling 2001). Central to this approach are values and respect for our natural environment and ourselves. The DESD breaks down the traditional educational scheme and promotes education with the following features:

- Interdisciplinary and holistic: learning for sustainable development embedded in the whole curriculum, not as a separate subject;
- Values-driven: sharing the values and principles underpinning sustainable development;
- Critical thinking and problem solving: leading to confidence in addressing the dilemmas and challenges of sustainable development;
- Multi-method: word, art, drama, debate, experience … different pedagogies which model the processes;
- Participatory decision-making; learners participate in decisions about how they are to learn;
- Locally relevant; addressing local as well as global issues, and using the language(s) which learners most commonly use (UNESCO 2005, p. 3).
Universities have a uniquely important role in the development of education for sustainability for the following three reasons: universities produce those who will maintain the existing power structures; academics themselves create and run society’s political and social institutions that in theory underpin and run our capitalist economy and technological direction, direct the world’s media, and educate our students; and universities are afforded a very privileged status by society (Jucker 2002a, p. 242).

While some overseas universities have shown their commitment to achieving institutional change for sustainability through their curriculum development programs (Thomas 2004), few (if any) institutions have been able to achieve genuine, lasting change (Bekessy et al. 2003). This situation is replicated in Australia, as the following reviews suggest that few Australian universities have attempted to integrate sustainability into curricula:

- In response to a survey in late 2000, the majority of universities (total 21) stated that sustainability issues were covered in their curricula, but the extent of coverage was notably variable (Thomas & Nicita 2002). About one-third included sustainability education in the curricula of specific departments or disciplines, but less than half replied that sustainability education was included in all disciplines.

- A study by Bekessy et al. (2003) found that a slight majority of Australian institutions addressed sustainability within their curricula, however, integration of environmental knowledge, values and ideas into courses across institutions was at a low level.

- A survey conducted by Carpenter & Meehan (2002) found that only one university made a specific reference to ‘greening’ the curriculum, but this study had a low response rate.

- A survey of university websites in 2003 showed that few were interested in a green curriculum (Thomas & Nicita 2003).

- A survey in 2006 conducted by Lang, Thomas and Wilson (2006) found that very few Australian or New Zealand universities have adopted sustainability as a guiding principle and most universities do not have education for sustainability ‘on their radar’, despite being a signatory to the Talloires Declaration.
• Tilbury et al. (2005, p. 1) found that ‘sustainability initiatives in Australian further and higher education institutions focus on single projects to address sustainability, as opposed to a systemic view of learning and change across the institution’.

Key challenges faced by universities in implementing sustainability have been identified by the EU Socrates Thematic Network for Agriculture, Forestry, Aquaculture and the Environment (Bor et al. 2000); they include:

- Integrating sustainability presupposes the rethinking of institutional missions.

- The imprecise nature of sustainability can be seen as an advantage or disadvantage in evoking dialogue on implications for curriculum, pedagogy, etc.

- Sustainability is complex. The concept touches all aspects of our existence, involves deep questions about human responsibility and destination, and can been seen at different levels from micro to global and through different perspectives. Therefore, curriculum review based on sustainability is a holistic and interdisciplinary exercise.

- Planning for sustainability education will lead to questions about purpose, content and method and the role of teachers in the institutions. It requires teachers to also see themselves as learners, and to work with uncertainty and open outcomes.

- There is no blueprint for institutional and curriculum reform. Successful change depends on an inclusive and communicative process (cited in Martin & Jucker 2005, p. 26).

Additionally, universities represent the underlying values of society; often operating like a business with little moral leadership (Huckle 2005; Jucker 2002a; Newton 2009). Universities are a reflection of our mechanistic, utilitarian worldview, which has separated pure from applied and objective from subjective (Clugston & Calder 1999). Traditional disciplines, together with outdated inflexible structures and systems, contribute to the lack of university engagement with education for sustainability.

Furthermore, education in universities is typically fragmented and almost ad hoc, in contrast to the trans-disciplinary approach required for education for sustainability (Dawe, Jucker, R & Martin 2005; Katayama & Gough 2008). This is particularly problematic when it comes to thinking about the implementation of sustainability education, as relevant discourses display particular tendencies towards deterministic language that aims to assist/develop understanding of certain worldviews, skills and
values (García et al. 2008; Hegarty 2008; Scott 2002). Key to embedding sustainability into educational praxis (curriculum, pedagogy, and practice) is an understanding of the language and the hidden assumptions, traditions and motivations through which meaning and knowledge are themselves constructed and how this relates to our own professional and personal identity (Corney & Reid 2007; Hegarty 2008).

Universities have a key role to play in helping society move towards a more sustainable existence. While many have changed their operational procedures, there has been less progress in the implementation of learning and teaching and curriculum that is relevant to the needs of sustainable development. The need for understanding change in universities at both learning and teaching and curriculum and organisational levels is paramount if education for sustainable development is to be successful.

### 2.3 Defining the sustainability paradigm and its links to education

In a broad sense, commitment to education underpinned by a sustainability paradigm reflects a moral responsibility to address a range of profound social and environmental challenges (Lozano-Garcia et al. 2008). However, there has been much discussion and debate about specific definitions of sustainable development and consequently about the use of the term in an education context (Huckle 2005; Mebratu 1998). Cotton et al. (2007) and Jones, Trier & Richards (2008) argue that the introduction of sustainable development in higher education is constrained by ongoing confusion over terminology and controversy over whether sustainable development is a valid part of the curriculum. Many scholars (Gligo 1995; Huckle 2005; Huckle & Martin 2001; Jucker 2002b; Sterling 2001; 2003) argue that the term sustainable development is contradictory and limiting, and that it is often interchanged with sustainability. Cotton et al. (2007), Fien (2001), Hegarty (2008) and Huckle (2005) concur that individuals define and understand sustainability and sustainable development from their own ethical and epistemological assumptions, and this is reflected in the variety of approaches to learning and teaching practice.

Corney & Reid (2007) believe that although interpretations of the terms ‘sustainable development’ and ‘education for sustainable development’ (ESD) differ in their emphases, two general themes can be recognised:
There is increasingly widespread concern about damage to environments arising from the trends and variations in people’s life chances and lifestyles, their relationships with others, and with the world around them. That developing better understandings of the issues associated with the first theme, and how they affect both the quality of people’s lives and the future of life on the planet, requires learning to be at the centre of efforts and initiatives to foster sustainability (Corneya & Reid 2007, p. 33).

Many scholars (Bonnett 1999, 2002; Corneya & Reid 2007; Elliott 1998; Luke 2001; Nikel 2005; Rauch 2002; Sauve 1996, 2002) believe sustainable development in relation to education should be thought of as three core elements—environment, economy and society—and the way the inter-relationships between them are configured should be understood. (e.g. Summers, Childs & Corney 2005; Summers, Corney & Childs 2004). Further, Corneya and Reid (2007) believe that the relationship between ESD and sustainable development can be ‘clarified by adapting typologies from environmental education focusing on education about, in and for the environment’ (p. 581). Cotton et al. (2007) and Corneya and Reid (2007) recognise the work of Palmer and Neal (1994) and Sterling (2001) where they argue that education about sustainable development simply transmits ‘factual’ information about sustainability concepts and processes (leaving existing assumptions unchallenged) using didactic educational approaches, while education in sustainable development uses experiential and interactive learning processes (a more learner-centred approach) to nurture an emotional connection and assist in the development of greater understanding, and education for sustainable development is oriented towards a more transformative approach to education encouraging the adoption of sustainability principles, ethics and values. While Cotton et al. (2007) recognise that this approach works well in assisting understanding of the different relations ESD may have with sustainable development, it does not diminish the extent of user interpretation, as the terms are all subjectively defined, and conceptualised and enacted in diverse ways.

This subjectivity and resultant diversity in understanding and application of sustainability in education is the central ‘problem’ of ESD (Bonnett 1999; Fien 2001; Huckle 2005). At the heart of all definitions of sustainable development and sustainability is the fact that our definitions and understandings of the terms are constructed from the way we understand and construct knowledge and then make meaning from the resultant language (Hegarty 2008). Our understanding of the reality of the world and our actions
within it are founded on and built around our own theoretical frameworks, or worldview (Bawden 1997; 2005). These are directly constructed from our individual and collective ethical and moral value codes and are added to directly from experience (Bawden 1997, 2005; Hegarty 2008; Murray, Brown & Murray 2007; Murray & Murray 2007). This then becomes problematic in that:

Each culture, each sub-group, each wave of history seems to be guided, informed, and directed by particular interpretations about the nature of reality ... [T]he term ‘paradigm’ is now commonly used to describe this interpenetrating mix of beliefs, philosophies, and myths that together comprise the widely accepted cultural ‘lens’ through which one perceives the world (GEESE 2006, p. 8).

However, paradigms and worldviews are subject to change as new knowledge is discovered or created, and as human beings grow and become ready for deeper and fuller realisations (GEESE 2006). As sustainable development/sustainability is an ethical and moral goal/concept, the way it is defined and understood will be determined by our experiences and worldviews (Bonnett 2002; Huckle 2005). Different paradigms will use different terminologies. For instance what is seen as sustainable development from one perspective could be considered contradictory from another perspective; Fricker (2002) suggests that ‘sustainability resonates deep within us, but as a goal it eludes us’ and that it is an ‘oxymoron’. Fricker (2002) discusses the Brundtland report’s (1987, p. 43) definition of sustainable development (‘development that meets the needs of the present without compromising the ability of future generations to meet their own needs’) and argues that it has resulted in sustainable growth and sustainable development being captured by the dominant paradigm, where

sustainable development is brandished as a new standard by those who do not really wish to change the current pattern of development ... Sustainable Development alone does not lead to sustainability. Indeed, it may in fact support the longevity of the unsustainable path (Fricker 2002, p. 428).

Fricker (2002) argues that the Brundtland definition is founded on the assumptions embedded in a scientific worldview, the notions of fiscal growth and advantage. The definition of sustainable development constructed from an eco-centric worldview would be starkly different, with development perhaps being thought of as a pathway to a future world where environmental, social and economic growth are synergistic, and are
embedded in a completely different set of assumptions (Bonnett 2002). Consequently, definitions and our understanding of them is a reflection of the ability of the individual to interpret and construct knowledge as it is informed by their assumptions (Hegarty 2008). Given that the construction of knowledge and understanding is inherently linked to an individual’s own identity and experience, discussions of definitions of sustainable development and sustainability are meaningless without a context and examination of self (Hegarty 2008; Sterling 2001). As stated by Bawden (1997)

> Given that our worldviews … reflect our most fundamental belief positions, it is not at all surprising that we hold to them with such conviction. It is equally understandable that communication between people with different worldviews, is typically so distorted (p. 8).

Bawden (2005) argues that a paradigmatic change in our thinking is required so that individuals learn to be systemic in the manner in which they deal with others, as well as with nature itself. Bawden (2005) argues that systemic thinking recognises three interdependent dimensions:

1. ideas and actions to improve the world about us;
2. ideas and actions to improve the way we generate ideas and actions to improve the world about us; and
3. ideas and actions to improve our intellectual and normative capacities to improve the way we generate ideas and actions etc. (p. 152)

Bawden (2005) advocates that we consciously develop our worldviews, as our experiences (prior knowledge, beliefs, skills etc.) have a major influence on what we learn, how we learn it and contextualise it. Consequently, education must then recognise that there are multidimensional worldviews, and those systemic approaches to education … would then be grounded in the belief that epistemic foundations can be both challenged and changed through ‘movements to more advanced states’ which themselves reflect complex evaluative positions involving epistemological, ontological and axiological features (pp. 156–7).

Closely related, Reid (2002) suggests that sustainability and environmental education each

(i) encourage distinct notions of thinking, valuing and acting for teachers and learners;
(ii) suggest specific priorities for thinking, valuing and acting in what is practised as ‘education’; and

(iii) invoke particular features of thinking, valuing and acting over others regarding what is fundamental to their distinctiveness from, and relationship to, each other and ‘education’ more widely (Reid 2002, p. 5).

This is problematic, as it translates into the development of pedagogy, learning and teaching practice and curriculum that is directly underpinned by an individual’s philosophical and epistemological foundation (Fien 2001). By adopting a particular paradigm, environmental education and education for sustainable development are already ideologically predetermined (Robottom & Hart 1993). Orr (1994) suggests that environmental education and education for sustainable development are shaped by a scientific worldview and consequently argues that ‘It is not education, but education of a certain kind, that will save us’ (p. 8).

Hegarty (2008) argues that the education for sustainability movement must be ‘described as teleological, with a clear and indisputably political goal in mind, which is the change of practice and ethics around environmental and social decline’ (p. 686). Central to this is the notion of responsibility and the identification and understanding of underpinning assumptions of both the individual and the collective. Transformative change will occur only if we recognise and explore the role that political, personal, professional and disciplinary practice play in shaping our understanding of education and sustainability (Hegarty 2008; Huckle 2005; Kemmis 2008b; Robottom & Hart 1993).

Table 2.1 illustrates how the assumptions and methodological issues associated at an epistemological, ethical and ontological level shape the culture and practice of academic disciplines. Robottom & Hart (1993, p 27) believe that ‘by adopting a particular paradigm (whether we do so consciously or not), we are ideologically prefiguring our activities on a broad educational front’.

While Robottom & Hart have discussed this from an environmental education perspective, the same can be expected to be true for education that is underpinned by a sustainability paradigm.
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<th>Interpretivist</th>
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| Roles                        |                                                |                                                |                                               |
|------------------------------|                                                |                                                |                                               |
| Goals of environmental education | Externally imposed taken-for-granted           | Externally derived but often negotiated         | Critiqued (seen as icons of ideology)         |
| Teacher’s role               | Authority-in-knowledge                         | Organiser of experiences in the environment    | Collaborative participant/inquirer            |
| Student’s role               | Passive recipients of disciplinary knowledge   | Active learners through environmental experiences | Active generators of new knowledge           |
| Curriculum supporters        | Disseminators of prepared solutions to environmental problems | External interpreters of the learners’ environments | Participants in new problem-solving networks |
| Role of texts                | Pre-existing source of authoritative knowledge about the environment | Pre-existing source of guidance about environmental experiences | Emergent reports of outcomes of critical environmental inquiries |

(Robottom & Hart 1993, p. 26)

To avoid predetermining educational and sustainability research and practice and to enable learners to address the issues of sustainability, the science of nature and society needs to be set in a broader context (Bonnett 2002). Bonnett argues that we must engage students in enquiry that reveals the underlying dominant motives that are in play in society: motives that are inherent in our most fundamental ways of thinking about the world and ourselves. Any education with more sustainable outcomes as a goal must
therefore include the social discourse, where the fundamental issues and values are explored collaboratively within the groups or community concerned. Dryzek (1997) believes that

> A discourse is a shared way of approaching the world. Embedded in language, it enables those who subscribe to it to interpret bits of information and put them into coherent stories or accounts. Each discourse rests on assumptions, judgements, and contentions that provide the basic terms for analysis, debates, agreements, and disagreements, in the environmental area no less than elsewhere (Dryzek 1997, p. 8).

Concepts such as sustainability, democracy, citizenship and quality of life take on different meanings within different discourses, which is especially apparent in the different disciplines within a university (Fricker 1998). Becher and Trowler (2001, Eggins and Macdonald (2003), Hall (2002), Hegarty (2008) and Shulman (2004) all argue that academic identity is located within disciplinary origins; we are ‘discipline bound’. Hegarty (2008) cites this is a major obstacle to education for sustainability (EfS) given that the very nature of sustainability as a paradigm requires the exploration and a rethink of our own values. Hegarty (2008, pp. 683) quotes Wals and Jickling (2002), who argue that sustainability includes ‘deep debate about normative, ethical and spiritual convictions’. Hegarty believes that even those who claim to be sustainability educators currently avoid recognising these values, resulting in a lack of exploration of the values and beliefs of others. This is problematic, as Hegarty (2008, p. 686) points out, ‘There is no “value-neutral” space’ in education.

Sterling (2001) recognises the role that assumptions and methodologies play in the culture and practice of academic disciplines (as highlighted by Robottom & Hart 1993) and believes that for our behaviour to change, we need to rethink our perception of reality. This can occur only when all three levels of cognition processing as described by Kitchener (1983) are recognised: (a) cognition, which deals with knowledge; (b) metacognition, which deals with knowing about knowing; and (c) epistemic cognition, which deals with knowing about the nature of knowing. David Orr (1994) argues that the environmental crisis we currently face has resulted from a disconnection between the way we see, perceive and act. He argues this is not so much a problem in education, but a problem of education (p. 5).
Building on the work of Orr (1994), Sterling (2001) identifies three areas that require reflective thought and action if the self-awareness required for such change is to occur – our normative, descriptive and practice aspects, which make up the way we view reality. Sterling (2001) believes that if a change is to occur, we must understand and reflect on the way we

- construct knowledge (epistemology), or use our ‘heart’ to experience life
- understand how this shapes our view of reality (ontology), or how our experience influences the way we think, use our ‘head’
- translate this into the discovery of new knowledge (the tools we identify with/use to facilitate inquiry or action), or how we use our ‘hands’.

Table 2.2 presents the areas that must be consciously identified and understood to enable individuals to change their own professional and personal practice towards a more sustainable way of being. Sterling (2001) argues that in our Western tradition the conceptual dimension (intellectual knowledge) is the most highly valued, but for transformational change to occur, all dimensions must be valued equally.

Table 2.3 illustrates how we, as individuals, can translate the theory presented by Sterling and put it into practice.

**Table 2.2: Ways of viewing reality and change required for a more sustainable worldview**

<table>
<thead>
<tr>
<th>Ways of viewing reality</th>
<th>Change required to effect change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 A normative aspect (ethos): This affirms beliefs and courses of action</td>
<td>• ‘A vision that is a philosophy and direction</td>
</tr>
<tr>
<td>2 A descriptive aspect (eidos): How we conceive the world</td>
<td>• An image of the desired state in terms of core values and ideas as a basis for discussion, and</td>
</tr>
<tr>
<td>3 A practice aspect (praxis): Manifestations and action</td>
<td>• A design that allows realization of the image’</td>
</tr>
<tr>
<td>(Sterling 2001, p. 49)</td>
<td>(Sterling 2001, p. 51)</td>
</tr>
</tbody>
</table>
Table 2.3: Translation of change theory into practice (adapted from Sterling 2004, p. 92)

<table>
<thead>
<tr>
<th>Epistemology/Ethos</th>
<th>Ontology/Eidos</th>
<th>Methodology/Praxis</th>
</tr>
</thead>
<tbody>
<tr>
<td>The study of the nature of knowledge its origins, structure and validity (Crotty 1998)</td>
<td>The study of the nature of being, existence, or reality including an understanding of the basic categories of being and their relations (Crotty 1998)</td>
<td>The practice dimension of paradigm, arising from and related to theory and epistemology. (Crotty 1998)</td>
</tr>
<tr>
<td>It is the question we ask of ourselves when we reflect on and attempt to understand how we come to know what we know. These questions are answered with our perception of lived experience our <strong>Heart</strong></td>
<td>It when we ask ourselves what exists and what is describing this to me These questions are answered with our understanding of the construction/conception of knowledge our <strong>Head</strong></td>
<td>It is the questions we ask ourselves in relation to the assumptions we bring to our actions These questions are answered upon critical reflection of practice/actions undertaken with our <strong>Hands</strong></td>
</tr>
<tr>
<td>Perception</td>
<td>Conception</td>
<td>Practice/Application</td>
</tr>
<tr>
<td>‘action or ability of gaining knowledge through the senses’*</td>
<td>‘to form ideas’**</td>
<td>‘action or process for doing something’*</td>
</tr>
<tr>
<td>Ethos</td>
<td>Eidos</td>
<td>Praxis</td>
</tr>
<tr>
<td>‘basic spiritual character of a culture’*</td>
<td>‘the distinctive expression of the cognitive or intellectual character of a culture or a social group’**</td>
<td>‘action that is entailed by theory’***</td>
</tr>
</tbody>
</table>

**Seeing Domain** | **Knowing Domain** | **Doing Domain**

Notes
Sterling (2001) recognises three different approaches to education underpinned by a sustainability paradigm which embody different degrees of understanding, constructing and translating knowledge:

- Education about sustainability is ‘learning as maintenance’ (p. 60), not challenging the current paradigm. This is first-order learning and has a context/knowledge basis, takes on some sustainability concepts easily inserted into ‘the existing educational paradigm’ (p. 60).

- Education for sustainability is ‘an adaptive response that equates to second-order learning’ (p. 60), based on values and capability. The existing paradigm reflects more thoroughly the ideas of sustainability, but is largely unchallenged. Education is founded on an identified set of values; knowledge and skills needed to achieve ‘learning for change’ (p. 60), including the development of skills in critical and reflective thinking.

- Education as sustainability or sustainable education is third-order learning and change – a creative and paradigmatic response to sustainability. ‘This is a transformative, epistemic education paradigm, which is increasingly able to facilitate a transformative learning experience’ (p. 61). This form of education is holistic, with learning approached as change requiring the engagement of the whole person and institution (Sterling 2001).

This builds on the work of Bawden (2005), who believes that it is through epistemic learning that we learn to appreciate the nature of the worldviews and paradigms which we hold as the contexts for what and how we know, and also that we learn how to both challenge and, if appropriate, change them (Bawden 2005). The worldview that underpins different conceptualisations/terminologies about education based on a sustainability paradigm reflects the assumptions and epistemological positions of the user.
2.3.1 Sustainability education praxis

It is important to consider this new educational paradigm\(^2\) in the context of its praxis. Kemmis and Smith (2008) define praxis as

> a particular kind of action. It is action that is *that is morally committed and oriented and informed by the traditions of a field*. It is the kind of action people are engaged in when they think about what their actions will mean *in the world* (p. 4).

The authors argue that praxis in education today is ‘endangered’ (p. 5) and is slowly amounting to educational *practice*, which is simply following the rules. Praxis embodies the theoretical ideas of learning and teaching, and the conscious reflection on practice (pedagogy) or, put another way, learning and teaching and the development of curriculum that inform each other as it is related to an individual’s understanding of the role of education and their worldview.

Some academics argue that the decline of praxis can be attributed to the current misunderstanding of pedagogy. It has been suggested that is has occurred as tacit understanding and less purposeful terms have then been translated into practice. According to the European traditions, the term ‘pedagogy’ means much more then simply the practice of teaching, which is how it is often used in education today (Kemmis & Smith 2008a, 2008b; Loughran 2006). Fien (2001) argues that pedagogy is the development of learning and teaching strategies informed by the educator’s ‘vision of what education is for and how society might be’ (p. 23). Pedagogy is the awareness of our philosophical beliefs and the role these play in shaping our educational practice. Siemens (2004, p. 1) argues that ‘Learning needs and theories that describe learning principles and processes should be reflective of underlying social environment’. Consequently, the development of a theory of practice and an effective pedagogy leading to quality education must be considered to be more than the development and design of learning activities. De Figueiredo, Afonso, & de Cunha (2002) argue that pedagogy must include context, and that ‘if we wish to achieve effective learning experiences, the tensions in the interaction between content and context … must be intelligently managed’ (p. 3). Additionally, effective pedagogies must also include an

\(^2\) ‘New educational paradigm’ refers to sustainability education defined and described as ‘Education as Sustainability’ in the previous section (p. 33)
awareness of an educator’s self-identity, their norms and values, as these will link to their practice and in turn shape the development of their learners: ‘Identity formation and personal growth combine to shape the nature of pedagogy itself’ (Loughran 2006, p. 2).

The concept of educational practice, by contrast, has a broader application. Kemmis and Smith (2008) define practice as more general and encompassing and apply it to a wide variety of actions and activities in social settings. Consequently, praxis is the reflection of an educator on their own pedagogy (as defined/related to more traditional understanding of education) exhibited by their practices and the development of learning and teaching and curriculum. This has particular implications for sustainability education. Fien (2001) recognises that the issues and topics adopted by educators will be shaped by their understanding of their ‘beliefs and attitudes’ (p. 23) or pedagogy (consciously or subconsciously). He argues that the subsequent teaching strategies and curriculum ‘will significantly affect the nature of students’ learning experiences and the objectives achieved’ (p. 23). Knowledge and content are important, but so too is the pedagogy associated with individual teaching practices (Sterling 2001). Kemmis and Smith (2008) concur with these arguments and are concerned that the moral agency of the educator, the distinction between being an agent and being an operative (praxis versus practice), is at risk.

The neglect of praxis as it relates to sustainability education is reflected in a study undertaken by Jones, Trier & Richards (2008). This study explored the perceptions of academics and students towards embedding education for sustainable development (ESD) into undergraduate degree programs in the School for Earth, Ocean and Environmental Science (SEOES) at the University of Plymouth. The study identified that:

There is however a widely held view that the term ESD was related to content rather than pedagogy. In addition there is a general uncertainty about the: meaning, scope, boundaries, application and limitations of the term. This uncertainty is manifested by the perceived need for a clear definition as a prerequisite to embedding ESD in the curriculum (p. 349)

However Jones, Trier & Richards argue that this need is not real, as a singular definition suitable for all curricula would be undesirably restrictive. Consequently, they concluded that it is not only the curriculum content but also the pedagogical approach that determines the extent to which ESD is embedded in degree programs.
2.3.2 Sustainability education pedagogy

Sustainability education advocates for learning outcomes where students are able to engage in ‘critical and ethical reasoning’ (Fien 2001, p. 24), and this has implications for learning and teaching approaches and pedagogy, given that the complexities and the contradictions of the sustainability paradigm require a new approach to knowing and understanding, doing, relating and being (Marinova & McGrath 2004). Fien argues that sustainability education pedagogy must encourage educators to include the exploration of ‘questions, issues and problems of sustainability, especially in contexts relevant to them and their communities’ (2001, p. 24). To achieve second- and third-order transformative learning we need to move beyond a reductionist pedagogy (Sterling 2001). The literature on specific pedagogies for sustainability education reflects this and advocates for pedagogies that are interactive enquiry-based and student centred, those that epitomise constructivist learning theories (Bennett & Dunne 1994; Corneya & Reid 2007; Fien 2001; Summers, Childs & Corney 2005; Tilbury et al. 1995). Dialogical, critical and active learning – deep learning – requires a pedagogy in which teachers and students learn, reflect and act together, and by doing so transform themselves and the world around them (Freire 1972; Sterling 2001; Stibbe & Luna 2009; Warburton 2003). Orr (1994) and Sterling (2001) argue that education cannot promote sustainability while it remains dominated by modern forms of knowledge and pedagogy.

Sterling (1996) believes that to facilitate this radical change, the pedagogic approach should itself be socially sustainable in the sense that it is based on meaningful rather than token empowerment, participation and ownership. Dawe, Jucker & Martin (2005) concur with this and have categorised three approaches to EfSD similar to that of Sterling (1996) as (a) the personal approach, (b) connecting or re-connecting to reality, and (c) holistic thinking. Piccinin (1997) recognises these approaches when arguing for pedagogies that are learner-centred. Learner-centredness has evolved to counter the traditional teacher-centred approach to education, which has been authoritative in nature, and based on the transmission of a predetermined body of knowledge to a learner who is objectified (Pulist in-press). Learner-centredness addresses the issues of how knowledge is acquired, and empowers learners with a process that is active and dynamic and facilitates deep understanding. A learner-centred pedagogy is based on the needs of the learner rather than the needs of the teacher or the institution (Tam
2000). The objectives of a learner-centred pedagogy are highly compatible with those described by Sterling (1996) and Dawe, Jucker & Martin (2005) as education for sustainability education pedagogy, and begin to address the issues of praxis discussed by Kemmis and Smith (2008).

Whichever pedagogy is adopted for sustainability education, associated methodologies should be grounded in the following: experimental and cooperative learning; systemic thinking; the clarification and judgment of values; the critique of ideology; critical reflection and creative thinking; the envisaging of sustainable futures; sensory and empathic exercise; communication skills; and learning as a continuous process for all (Elliott 1991; Sterling 1996). Additional characteristics that have been identified include: creative participation in inter-disciplinary teams and learning from others (collaborative learning); problem-solving skills to deal with complex real-life problems; creative thinking; personal and professional self-reflection; holistic thinking; recognition and appreciation of environmental, social, political and economic contexts for each discipline; and experiential learning by reconnecting to real-life situations (Dawe, Jucker & Martin 2005; Fien 2001; HEA 2006; Sterling 2004).

Consequently, educators are faced with a challenge when choosing and implementing teaching strategies given the value-laden nature of subject matter and the greater teaching expertise required to use ‘interactive’ as compared with ‘didactic’ teaching strategies (Corneya & Reid 2007). A key consideration in sustainability educational praxis concerns the teacher’s choice of stance related to his or her own views on a given issue. This is supported by the research undertaken by Carew and Mitchell (2006) and Cotton et al. (2007), who identified that lecturers hold differing conceptions of sustainable development, and this implies different strategies for incorporating sustainability into the curriculum. Corneya & Reid (2007) concluded that there is no one ‘correct’ conception of sustainable development, or pedagogic approach; the ability and capacity to address sustainability education depends on teachers’ knowledge and beliefs about subject matter and pedagogy.

### 2.3.3 Sustainability education: learning and teaching

Subject content for sustainability education must focus on the inter-relationships between environmental, economic and social factors, which Corneya & Reid (2007)
argue are ‘complex and value-laden, and the terms used are open to differing interpretations’ (p. 36). Consequently, teaching strategies that reflect a learner-centred pedagogy should seek to develop capabilities which include the ability to identify problems, issues and questions to guide their learning, and allow for the recognition, value and ability to communicate with individuals/groups holding different values and ways of knowing (for example, Corneya & Reid (2007); Fien 2001; Huckle 2005; Sterling 2001; UNESCO 2005). Approaches to learning and teaching in sustainability education identified within the literature and reflecting the character of ESD pedagogies have been described as allowing students to be able to experience the following:

- development of knowledge from the learning process
- questioning of their assumptions
- recognition that constructing knowledge involves critical analysis, dialogue and reflection
- development in complex reasoning
- practice in demonstration of knowledge and skills
- practice in transferring problem-solving skills
- practice in the recognition of values and how this relates to their own action
- strategies for change
- uncertainty in data analysis and decision making
- critical analysis of the theories, data and values being presented to them
- identification of the connections between the principles of sustainable development and the disciplinary theory
- ability to challenge injustice and inequalities
- cooperation and conflict resolution
• critical thinking

• respect for people and things

• ability to understand their own sense of identity and self-esteem

• value and respect for diversity

(drawn from Holdsworth et al. 2006a; Parker, Wade & Van Winsum 2004; Parkin et al. 2004).

The learning outcomes and associated skills identified as sustainability education are aligned to more than one pedagogy. However, if deep learning is to occur, self-reflection and questioning of personal values and identity must begin with a learner-centred pedagogy, to which any of the pedagogies can then be added to or merged with, assuming these concepts are discretely identifiable and definable. Cuseo (2006) argues that using the following teaching approaches to a learner-centred pedagogy – active involvement, social integration, self-reflection and personal validation – will result in deep learning, intrinsic motivation and student retention.

2.3.4 Sustainability education: curriculum development

The lack of understanding of pedagogy and educational praxis directly affects the type of curriculum developed and type of learning and teaching approaches used to deliver it. Kemmis & Fitzclarence (1996) believe that central to the issues associated with curriculum is the problem of the relationship between theory and practice and the relationship between education and society. Curriculum can be defined as ‘an attempt to communicate the essential principles of an educational proposal in such a form that it is open to critical scrutiny and capable of effective translation into practice’ (Stenhouse 1975, p. 4). Kemmis & Fitzclarence (1996) argue that this places emphasis on curriculum as a ‘bridge’ between educational principles and educational practice and on the activities of consciously relating the two and reviewing the relationship between them.

Kemmis & Fitzclarence (1986) and Schwab (1969) argue that the focus on the development of curriculum that is founded on theory is incompetent ‘as a basis for wise
educational practice’ (Kemmis & Fitzclarence 1986, p. 14). They argue for a return to the
focus on ‘curriculum thinking and theorising in which the “arts of the practical” (the arts of
moral and political argument) were more central to thinking about education’ (p. 15).
Sterling furthers this with reference to sustainability education curriculum, arguing that
process is more important than content, and the relation between areas more important than
decontextualised studies, sustainability does suggest themes that should be reflected in any
general curriculum, whether or not it retains a subject basis (Sterling 1996, p. 36).

How sustainability is understood and practised by the educator will influence the
curriculum content that is considered relevant to disciplinary knowledge and practice.
The lack of understanding of pedagogy and loss of traditional educational praxis (Fien
2001; Kemmis & Smith 2008a) directly affects the type of curriculum developed. An
educator unconscious of their own values and norms may support understanding and
reinforcement of ‘the existing social and cultural mores’ (Fien 2001, p. 23). This
legitimates and reinforces the behaviours and lifestyle choices operating in our
communities, which have led to the current environmental, social and economic crises
that it is argued need to be mitigated, again through improved educational praxis. Fien
(2001) argues that beneath this diversity of knowledge must be an understanding of four
interdependent systems that underpin the sustainability paradigm, and that some
understanding of these systems is required so relevant content can be embedded into
existing and new curriculum within more traditional disciplinary areas. The systems are:

1 Biophysical systems – which provide the life support systems for all life, human and non-
   human;

2 Economic systems – which provide a continuing means of livelihood (jobs and money);

3 Social and cultural systems – which provide ways for people to live together peacefully,
   equitably and with respect for human rights and dignity;

4 Political systems – through which power is exercised fairly and democratically to make
decisions about the way social and economic systems use the biophysical environment
(Fien 2001, p. 4).

In order for these systems to be incorporated into curricula that reflects second- and
third-order learning, curricula must be founded on the following:
• inter-disciplinary and intercultural practice

• discourse with room for discussion, and subject diversity

• learning and teaching that approaches curriculum content in a holistic manner i.e. consisting of a mix of targeted activities, cognitive learning modules and emotional and practical experiences

• general components and the inter-connection of ecological/natural systems, social systems (including cultural and political), economic systems and political systems

• holistic or systemic thinking (and analysis)

• key current and historical sustainability issues in their local, regional and international context

• issues relevant to the discipline that explore society justice, diversity and equity (drawn from Baud 2004; Fien 2001; Holdsworth et al. 2006b; Parker, Wade & Van Winsum 2004).

2.4 Academic development and sustainability education in universities

Educators play a key role in developing and presenting the values associated with sustainability, hence it is critical that they have the understanding and capacity to share and assist in the development of knowledge (Huckle 2005). Academic development is necessary to provide educators with the capacity for understanding sustainability as an overarching conceptual framework, which can be used to reconsider the way we think and act towards each other and the planet. Academic development is also an important step in providing educators with the capacity to undertake sustainability educational praxis (Tilbury et al. 2005). García et al. argue that

‘It is increasingly evident that “capacity building of educators,” must be considered to be the cornerstone of transforming universities to become effective in empowering their students to become change agents for SD in their professional and personal lives after their university experiences. If those who teach in HE are not versed in, conscious about and committed to
A significant transformation is required for universities to meet the challenge posed by the sustainability movement and to educate for the long-term changes in behaviour required to address social and environmental issues. Jucker (2002a, p. 246) argues that ‘social values, institutional structures, personal privilege and power politics’ ensure that universities are leaders in unsustainable behaviours. Acceptance of their responsibility would require a shift in thinking, values and action that would have profound impacts on all activities. If the development of educational praxis (including pedagogy, learning and teaching and curriculum) is underpinned by an academic’s own epistemology and ontology, it must be acknowledged, as it defines an educator’s purpose. Tilbury et al. (2005) argues that the development of sustainability curricula in universities needs to be accompanied by a process of ‘institutional strengthening and professional development in order for their principles to be translated into practice’ (Tilbury et al. 2005, p. 40).

Despite recognition of the need for this kind of academic development, examples of programs are rare (García et al. 2008; Sibble 2009). Thomas and Nicita (2003) identify the lack of academic development programs as a key barrier to the adoption of environmental and sustainability literacy. Their survey found that despite the fact that academic staff were generally sympathetic to sustainability they felt constrained by a lack of the following: leadership, access to information, training and information regarding the integration of sustainability into university curricula. The findings of this study were supported by a web-based survey of 38 Australian universities undertaken in 2007 to assess the status of sustainability-focused professional development programs in Australian universities (Holdsworth et al. 2008). This study found that only one of the 38 Australian universities offered a professional/academic development course designed to introduce academics to sustainability and the teaching of sustainability. Of the universities surveyed, all but two had information on academic development programs available online, indicating that this type of information was not generally considered sensitive, i.e. available only to staff (Holdsworth et al. 2008).

For sustainability education to become embedded in universities, a change in educational praxis is required, and a new learning culture (Kemmis 2009; Kemmis &
Smith 2008) needs to be developed. This learning culture cannot be founded on academic tradition and principles of indoctrination, but needs to evolve out of an open-minded and participative process. Barth et al. (2007) claim that essential to this is that the process itself is relevant and related to an academic’s own sphere of influence and desires, but also related to individual and societal learning. In order to achieve this, Barth et al. (2007) call for professional training, coupled with the promotion of personal development, which gives learners the skills to cope with complex situations, to act upon reflection, to take responsibility, to consider ethical standards when acting and to be able to judge consequences. Barth et al. (2007) recognise three learning processes to achieve a new learning culture:

1. Competence-orientation. The focus of learning processes is on attaining relevant key competencies.

2. Societal orientation. Learning for sustainable development includes both formal and informal learning situations grounded in societal learning.

3. Individual centering. Learning by the individual is seen to be active in the societal context, both formally and informally (Barth et al. 2007, p. 419).

Barth et al. (2007) believe that sustainable development can be seen as a normative starting point for selecting relevant key competencies. They write from a German perspective, where developing ‘Gestaltungskompetenz’ (shaping competence; de Haan 2006) has been discussed as the central educational objective of ESD. ‘Gestaltungskompetenz’ encompasses a set of key competencies which are expected to enable active, reflective and co-operative participation toward sustainable development.

‘Gestaltungskompetenz’ comprises the following eight key competencies:

1. foresighted thinking;

2. interdisciplinary work;

3. cosmopolitan perception, transcultural understanding and co-operation;

4. participatory skills;

5. planning and implementation;

6. empathy, compassion and solidarity;
Barth et al. (2007) argue that a focus on key competencies and the key principles of teaching in higher education creates two challenges for sustainability education:

- orientation towards interdisciplinarity, requiring new ways of communicating and cooperating. Academics and graduates should be able to understand different disciplinary perspectives, and should be able to work through complex problems.
- strengthening self-reliance and self-direction in the learning process. Barth & Godemann (2007) recognise that successful self-directed learning competencies or specific personality traits are necessary, which cannot be directly influenced, but can form the basis for adapting an individual learning strategy.

In order for individuals to develop or acquire these competencies, knowledge needs to be restructured within an individual’s own mental models, and new ways of thinking and personal understanding developed based on experience, viewpoints and contexts. Three aspects of the learning process were identified within Barth et al.’s (2007, pp. 425–6) study as significant in the development of these competencies:

1. Reflection processes.
2. Self-reliance and self-direction.
3. Multiple contexts.

The role of academic development in the facilitation of sustainable education praxis is further strengthened by the establishment and signing of international declarations. The Talloires Declaration of the University Leaders for a Sustainable Future (ULSF) has guided many universities towards more sustainable practice in terms of both operations and learning and teaching (ULSF 2001). This initiative recognises and encourages professional development as one way of building capacity within the academic community for the development of sustainability curriculum. The Talloires Declaration is a ten-point action plan for incorporating sustainability and environmental literacy in teaching, research, operations and outreach at colleges and universities. The
declaration states that action is required in relation to sustainability education and professional development in the following areas:

Action 2. Encourage all universities to engage in education, research, policy formation, and information exchange on population, environment, and development to move toward global sustainability …

Action 4. Create programs to develop the capability of university faculty to teach environmental literacy to all undergraduate, graduate, and professional students …

Action 7. 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 (ULSF 2001, p. 1).

The UN Conference on Environment and Development (UNCED) in 1992 resulted in the development of Agenda 21, an action plan for implementing sustainable development across the world (UNCED 1993). Chapter 36 of Agenda 21 recognised education, public awareness and vocational training as key vehicles for promoting sustainable development. Another declaration that has considerable relevance to professional development programs for educators is the Swansea Declaration, which was developed in Wales in 1993 by the Association of Commonwealth Universities (ACU), and was inspired by the examples of Talloires and Halifax. The declaration states that universities of the Commonwealth should

\[
\text{[e]nhance the capacity of the university to teach and undertake research in sustainable development principles, to increase environmental literacy, and to enhance the understanding of environmental ethics within the university and with the public at large (UNESCO 2007).}
\]

Clearly, the case that professional development is a priority has been strongly made.

2.4.1 Understanding of academic development

The term ‘academic development’, like ‘sustainable development’ and ‘sustainability’, is problematic to define despite being widely used and (variously) understood. There is debate as to whether academic development is what people ‘know’ or what they ‘do’ and whether it is a profession or an activity. There is no one dominant approach, given different traditions within institutions and between countries (Macdonald 2003), nor is there a commonly understood term to describe the area of practice. However, Webb
(1996) argues that the process of ‘development’ is more important than a staff development model with a foundational position. Bradley (2000) argues for an eclectic mode of academic development that encourages inquiry and continuous conversations about problems and practices, without prescriptive outcomes. Tensions may arise between academic staff and the academic developer when working as an ‘expert’ rather than as a partner or colleague (Bradley 2000; Webb 1996). Consequently, Candy (1996, p. 16) argues that academic developers should be identified not as para-professionals, but as meta-professionals who are academics par excellence.

Despite the different definitions, Nicholls (2001) and Kreber (1999) recognise three core areas for academic development. Nicholls (2001, p. 36) argues that academic development programs must include:

- development of the professional knowledge base
- competence in professional action
- development of reflection.

In order to develop professional knowledge and action a key facet of development includes ‘learning from learning’ (Nicholls 2001, p. 38). Edwards (1997) emphasises that there has been a shift in perspective from education as the provision of training to education having a focus on the learner and learning. Edwards (1997) and Nicholls (2001) both argue that the discourse of lifelong learning has shifted to one of reflexive challenges requiring ‘the professional to learn and understand the learning that has taken place’ (Nicholls 2001, p. 39).

In this context Kreber (1999) recognises three different types of knowledge domains that must be included in any academic development program:

- **Instructional knowledge** is knowledge about how to teach (instructional design), and includes knowledge about teaching strategies, lesson planning, classroom behaviour, learning objectives and assessment strategies.

- **Pedagogical knowledge** is what we know about how students learn. This informs instructional knowledge and includes an understanding of learning style, cognitive style, the cognitive and affective processes involved in learning, and group dynamics:
‘Pedagogical knowledge is concerned with how to teach the content of the discipline, how to assist students in problem solving and thinking within the discipline, and how to foster thinking and learning beyond the discipline’ (p. 312).

- Curricular knowledge is an understanding of the knowledge we use to develop the goals and purposes of courses that inform the curricula within them.

These approaches recognise the need to evolve academic development from a focus on teaching skills and methods (Ho 2000) underpinned by assumptions that prescribed skills and teaching recipes will produce better teachers. Pickering (2006) recognised that lecturers’ conceptions of teaching influence their preferred teaching practices. Genuine improvement in teachers must begin with a change in their thinking about teaching and learning itself (Bowden 1989; Gibbs 1995; Gow & Kember 1993; Ho 2000; Ramsden 1992; Trigwell 1995). As observed by Kember and Kwan (1997),

> teachers who conceived teaching as transmitting knowledge were more likely to adopt content-centred approaches to teaching while those who espoused a facilitative conception tended to use the learning-centred approaches (cited in Ho 2000, p. 30).

Additionally, Pickering (2002) concluded in a study of the influence of professional development in novice academics that the degree of change is affected by the individual’s core beliefs. Pickering (2006) found that ‘core beliefs influence pedagogic beliefs … and have the potential to bring about change in the individual’s pedagogic perspective’ (p. 328). Pickering explains that exploration of an individual’s core beliefs allows them to identify what is possible, plausible and describes academic development approaches that must be situated in ‘complex contexts which reflect lived experience’ (p. 329).

Hegarty (2008) argues that collective and individual values, beliefs and structures characterise the culture and subsequent practice of universities. These must be considered when thinking about change initiatives, especially those focusing on reframing the curricula and operational activities with a sustainability orientation. This is especially important, as Hegarty (2008) argues that the identity of the scholar is inherently embedded in notions of power and ego; the scholar is an ‘authorised knower, knower-with-status’ (p. 682). Hegarty recognises the notion of ‘learner’ as the opposite
to that of ‘authorised knower’, which places the ‘scholar as learner’ in a highly vulnerable state. The status of ‘learner’ is seen as inferior to that of ‘authorised knower’, which has taken scholars many years to achieve. Change requiring learning, in a higher educational context, is then seen as making existing knowledge redundant and ‘superseded almost instantly’ (p. 682). While learning enables us to respond to change in a meaningful way, ‘knowing and knowledge itself’, central to academic/scholarly identity and culture, then becomes a powerful resistance to change. Hegarty (2008) recognises that the challenge for academics is to create a culture which recognises and values ‘response-able’ learning.

### 2.4.2 Models of academic development

#### Reflective practice, critical thinking

Two elements central to good learning and teaching practice are reflection (Nicholls 2001; Schön 1988) and critical thinking (Cheetham & Chivers 1996; Kolb 1976). Nicholls (2001) argues that at the centre of our practice should be a reflection of practice and that this is core to academic development. Reflection can be defined as thinking about action with the intention to improve it (Halton & Smith 1995). Schön (1988) distinguishes ‘reflection in action’, which is akin to immediate decision making, from ‘reflection on action’, which provides a longer and deeper view. What is needed is for reflective practice to become second nature in all aspects of academic teaching and learning practice. Reflective capacity on both a personal and professional level is crucial to the development of the academic within the environment of universities (Nicholls 2001; Schön 1988), but this needs to be combined with critical thinking if alternative practice is to result. Kolb (1976) and Cheetham and Chivers (1996) build on the work of Nicholls (2001), Schön (1988) and Rowland (2003) and have both developed models of academic development founded on the notion of critical reflective practice. Kolb (1976) describes learning as being immersed in experience that allows for observation and reflection; this he illustrates using a four-stage experimental learning cycle (see Figure 2.1).

Kolb’s (1976) experiential learning cycles are founded on the principles of observation and subjective development of a new theory that leads to inform new ways of practice. Assuming alternative forms of practice are adopted, these new learning theories should
inform such practice and lead to the creation of new concrete experiences (CE). These new experiences lead to reflective observation (RO) and in turn the formation of abstract concepts (AC). Finally the cycle is completed through the use of these abstract concepts to guide decision making and experimental action to solve problems (AE). This learning cycle clearly illustrate that different learning situations develop different skills (Kolb 1976).

**Figure 2.1**: Kolb’s (1976) experiential learning cycle (adapted from Nicholls 2001, p. 55)

Kolb’s approach allows us to identify and understand learning experiences that can point to practical implications. While Kolb’s experiential learning cycle explains how learning through a particular experience occurs, it does not tell us if this learning can be transferred to other situations. Nicholls (2001) argues that for improvement in an individual’s everyday environment to occur, additional learning through a second set of learning cycles with deeper critical reflection is required.

Cheetham and Chivers’s (1996) generic professional development model combines a competence-based approach to academic development with that of the ‘reflective practitioner’ (Schön 1983). The model suggests a set of overarching meta-competencies required for any job and a set of core components of professional competence. These
competencies are then underpinned by the notion of reflective practice to ensure they continue to grow and develop. Cheetham and Chivers (1996) define these core component competences in the following way:

- **knowledge/cognitive competence**: ‘possession of appropriate work-related knowledge and the ability to put this to effective use’;
- **functional competence**: ‘ability to perform a range of work-based tasks effectively to produce a specific outcome’;
- **personal or behavioural competence**: ‘ability to adopt appropriate behaviours in work-related situations’;
- **values/ethical competence**: ‘possession of appropriate personal and professional values and the ability to make sound judgments based on these in work-related situations’ (cited in Nicholls 2001, p. 123).

The model acknowledges that academics (as learners) require a knowledge base, skills and competencies to underpin their teaching, management and administrative duties. The model identifies areas of specific competence appropriate to the main functional role of the academic allowing the identification of pathways to develop core competences. The model recognises institutional contexts and consequently facilitates the reflection of certain methodologies, values and norms associated with specific disciplines. In addition the model allows for ownership of the conceptual framework for academic development at a variety of levels within the institution depending on what is most appropriate.

### 2.4.3 Scholarship of teaching and research

Boyer (1990), Nicholls (2001) and Hegarty (2008) recognise the link between improving learning and teaching practice and research and argue that it is essential to changing attitudes towards learning and teaching. As Boyer (1990) states, the scholarship of teaching is distinct from the scholarship of discovery – but it is still scholarship, not just teaching. As there is no proven relationship between excellence in research and excellence in teaching at the level of the individual scholar, improving teaching must involve more than improving research. Nicholls (1997) argues that the future of professional development in higher education must involve improving the scholarship of
teaching. Academics must use and contribute to the literature, if the status and effectiveness of good teaching is to be secured.

Nicholls (2001) and Rice (1992) argue that accepting there is a connection between the knower and the known enables academics to draw on data, ideas or theories taken from their research projects and present them in a coherent and meaningful way to their students and other academics. Teaching requires academics to place their research into a broader context than their specific, narrow area of specialisation. Academics can benefit from reviewing their section of their discipline and placing their own work within the wider context of the discipline as a whole (Nicholls 2001). This type of reflexive process can help address what Rowland (1999) considers a significant issue for academics: ‘to consider how their understanding of the nature of learning (from their disciplinary standpoint) relates to their practice as teachers and learners’ (Rowland 1999, p. 312).

2.4.4 Disciplinary versus interdisciplinary

While research questions are specific to a particular discipline area, it is commonly assumed teaching and learning in higher education is largely generic across specialised disciplines (Rowland 2003), and thus academic development is seen to be of a different order. Hegarty (2008) and Rowland (2003) argue that the difference between disciplines shapes the way academics think about their teaching and learning, and that is it important to value the insights, concerns and epistemological assumptions that are particular to the different disciplines.

Jenkins (1996) and Healy and Jenkins (2003) argue that working within disciplinary communities is central to promoting academic development as a scholarly activity. They argue that academic staff primarily identify with their discipline and that disciplinary conceptions of knowledge and epistemology guide and shape discipline-based curricular research and scholarship. Healy and Jenkins (2003) present nine strategies for effective disciplinary-based scholarly educational development:

1. Expect hostility, and work for rewards from your disciplinary cohort.
2 Recognise the limitations of a disciplinary-based approach; many discipline-based staff
do not look to the scholarship and research on teaching and learning for solutions to their
pedagogic concerns and passions.

3 Recognise and seek to work with other discipline-based educational developers; working
effectively within a discipline requires outreach to other disciplines including educational
development and their scholarship and research.

4 Use and challenge your discipline’s research methodologies, in developing disciplinary
pedagogy scholarship of research and teaching it is vital to recognise research
methodologies and how it affects and shapes practice.

5 Create a learning and teaching disciplinary niche where teaching and learning is as
important as any other research specialism in the discipline. In order to achieve this,
those who are sympathetic and those who see this as central to their professional identity
must be brought together to form the critical mass. Hence projects, such as conferences,
must be developed that bring together and develop the specialists who don’t view this as
important.

6 National and international disciplinary networks form communities of practice that can be
used to communicate ideas of practice.

7 Use research as a driver to improve teaching and learning by encouraging the link
between the scholarship of teaching and the scholarship of research.

8 Disciplinary communities should support staff in their initial years of employment through
training programs.

9 Support disciplinary based continuing professional development (Healy & Jenkins 2003,
pp. 50–1).

While it is important to begin academic development programs from a disciplinary
context, Rowland (2003) recognises the merit of interdisciplinary academic
development. Rowland argues that debate and discussion in a mixed setting provide an
opportunity for these disciplinary epistemologies, assumptions, concerns, or just plain
customary practices, to be challenged by others from different backgrounds. In such a
climate of critique, academic development can become a critical interdisciplinary field. It
is important to distinguish ‘interdisciplinarity’ from ‘multidisciplinarity’ here. The latter is
merely an addition of the knowledge, insights and practices of different disciplines.
Interdisciplinarity or at least ‘critical interdisciplinarity’ involves the learner in confronting
the critique which emerges as different disciplines contest each other’s theoretical frameworks, perspectives and practices (Barnett 1997).

2.4.5 Theories underpinning conceptual change models of academic development in higher education

If educators are to adopt learner-centred approaches to teaching, and students are to adopt meaningful approaches to learning, then academic development efforts must focus on changing faculty conceptions of teaching to emphasise the facilitation of student learning. Ho (2000) draws on four theories to inform a set of change strategies designed to effectively challenge concepts of teaching and learning.

1 Transition between theories-of-action

Argyris and Schön (1974) describe the concept of ‘theories-of-action’, which recognises that an individual holds an underlying rationale for a particular action. They argue if an individual is to improve their professional effectiveness their theories-of-action must be built and then rebuilt; this can take place at two different levels:

- Single-loop learning: ‘development is limited to linear acquisition of new micro-theories that conform with the basic principles of the old theories’ (Ho 2000, p. 31). Learning is focused on the development of new skills and strategies that reinforce existing goals and beliefs; theories-of-action are maintained as there is no engagement in self-reflection.

- Double-loop learning is often the result of the recognition that current practice underpinned by an individual’s theories-of-action creates a conflict in practice. Double-loop learning uses self-reflection as a means to bring about a change in fundamental goals and beliefs. Ho describes three major sources of dilemmas identified by Argyris and Schön (1974):
  - Dilemmas of incongruity arising from the lack of congruence between espoused theory and theory-in-use
  - Dilemmas of internal inconsistency arising when the professional realises that coexisting beliefs and values within the theory-in-use have become increasingly incompatible
Dilemmas of *effectiveness* arising when the professional finds that it becomes increasingly difficult to achieve intended goals (Ho 2000, p. 32).

Central to double-loop learning is a transition between theories-of-action, which often involves conflict. As existing theories-in-use are self-maintaining and often unrecognised, conflict allows individuals to become aware of their existing theory-in-use, and admit to the sources of dilemmas. The confrontation will then create tension, leading to resolution of the dilemmas and thus to changes in the espoused theory or theory-in-use.

2 Theory of conceptual change

Posner, Strike and Hewson’s (1982) theory of conceptual change is based on the ‘assumption that conceptual change in learning is analogous to the model of development and radical shift in scientific beliefs among the community of scientists’ (Ho 2000, p. 32). Ho argues that this kind of conceptual change theory encompasses central and organising thoughts, analogous to Kuhn’s (1970) notion of a paradigm shift. There are two parts to the theory of Posner, Strike & Hewson (1982):

- The learning context in which the conceptual change takes place: the ‘conceptual ecology’ (Ho 2000, p. 32). ‘The conceptual ecology determines the way the learner handles old conceptions and responds to new conceptions’ (p. 32). The conceptual ecology is made up of cognitive artefacts, epistemological beliefs and knowledge from other fields. It shapes and motivates values and includes current conceptions and misconceptions held by the learner; it therefore serves to structure conceptual change.
- Certain conditions are required for conceptual change to occur:
  - There must be dissatisfaction with current conceptions.
  - A new conception must be intelligible.
  - A new conception must appear initially plausible – it must make sense to the learner.
  - A new conception must appear fruitful (Ho 2000, p. 32–3).
Ho (2000) argues that the central idea of the theory of Posner, Strike & Hewson (1982) lies with the learner being confronted with a conceptual conflict. This conflict initiates a learning process that involves replacing the original conception with a new one, provided it satisfies the other conditions.

3 Requisites for change

Ho (2000) presents five interrelated requisites necessary for change to occur as developed by Shaw et al. (1990):

- Perturbation – dissatisfaction or uneasiness with the way things are
- Awareness of a need to change – realisation that for things to improve there will have to be a change
- Commitment to change – decision to move beyond awareness and into action
- Vision – vision of what the change actually will involve
- Projection into that vision – visualises the learner and those directly related becoming participants in change.

4 Social change of force fields

Lewin (1947, 1951) recognises that social groups function at specific levels and that at any time they are in a state of equilibrium. Effecting change requires additional forces to act on the original state. Well-established social habits that are grounded in the social value of the individuals may act as inner resistance to change, and additional forces are required. Successful change requires three phases:

- unfreezing the present level – a process of clearing up the pre-existing prejudices
- building new beliefs, attitudes, values, and habits
- freezing again at the new level.

Ho (2000) concludes that confrontation is central to all four theories of change, and identifies two distinct phases embodied in the theories: the process of change and the
conditions or requisites for change to occur. The process of change lies in ‘first making people aware of their espoused theory and theory-in-use so as to confront them with the mismatch that exists between the two’ (Ho 2000, p. 34). The conditions for change to occur include the need for a psychological means to a new conception.

Ho (2000) draws on these four theories to provide a varied and comprehensive perspective of change, and then translates these approaches into a theoretical framework that can provide the foundation for conceptual change programs. Ho suggests this conceptual change program should have the following four elements:

- confrontation
- self-awareness
- availability of alternative
- building commitment to a new conception.

If we are to increase the number of graduates with capabilities in sustainability, we need to provide academics with the pedagogy, knowledge and skills to develop sustainability-related courses. This can only be successfully achieved by the promotion and facilitation of academic development programs for sustainability education. The structure of these academic programs is one determinant of their success. How they fit into the organisation itself is another important consideration.

2.5 Organisational change to support academic development in universities

Hegarty (2008) argues that universities, like all communities and organisations, are characterised by both their collective and individual values, beliefs and structures, and that academic and disciplinary modes of identity are arguably the constituent elements of scholarly cultures. These cultures are maintained, perpetuated and even enforced by the communities which develop within the disciplines, departments and schools. Consequently, when thinking about notions of changing practice we need to think about how practice is constructed, and recognise that it is highly related to site. Practice has
social connections, and much of what we do is shaped by our social and cultural structures (Kemmis 2008b, 2009). Hegarty (2008) argues that academic and disciplinary modes of identity, the constituent elements of scholarly culture, inform and shape practice.

For academic development to be successful it is imperative that the distinctive dominant culture of a university be understood and built into its pedagogy, learning and teaching approaches and curriculum. University culture is shaped internally by the notion of academic freedom and autonomy; externally the university structure, and its values and beliefs lead to the development of a distinctive academic culture (Hegarty 2008). The ability of a university and the individual to adapt to these is determined by its culture and the influence of the faculty, the administration, the discipline and the whole organisation. It is essential to understand university culture to minimise conflict and to foster the development of shared goals that may result from any academic development program.

Kemmis (2008a) argues that changing behaviours in organisations can occur only by understanding what constitutes individual actions. He draws on the work of Schatzki (2002), who recognises that there are ‘teleoaffective structures’ (p. 77) that provide overarching purposes and moral and emotional commitments that shape and structure practices. These structures directly relate to and influence individual praxis (or action more generally) and form ‘mediating preconditions’ that are constructed by practitioners, known as practice architectures (Kemmis & Grootenboer 2008). Kemmis (2008a) argues that ‘practice architecture’ both enables and constrains practitioners and practices, and thus ‘prefigures’ practices in three dimensions of human society: the cultural-discursive dimension (language), the material-economic dimension (work), and the socio-political dimension (power). Kemmis (2009) argues that practices are not the products of individuals, rather they are social products; an individual’s own practice occurs within a practice architecture. In addition to the knowledge, capabilities and values internal to a particular tradition, practice is constructed from meta-practices: practices that are external to the ‘work’ of individuals but still influence and shape practice including, for example, educational administration and policy making, initial and continuing teacher education, and educational research and evaluation.
As illustrated in Table 2.4, the language and discourses used by those within these practice architectures have discrete and distinctive meaning and significance as they relate to ‘sayings’, ‘doings’ and ‘relatings’. Each discourse has connotations and embedded meanings and association in relation to particular kinds of values, emotions and commitments. Kemmis (2009) argues that professional architectures and their associated mediating preconditions enable and constrain the conduct of individuals. Consequently, Kemmis (2008a) believes that changing professional practices is not just a matter of changing the understandings (sayings), skills and capabilities (doings) or values and norms (relatings) of practitioners, but also changing the practice architectures that enable and constrain practitioners, i.e. the operations within the different university communities (discipline, schools, departments etc.). Consequently, if we want to improve teaching (content and practice), we must recognise and deal with both the systemic and cultural aspects of a university, which are complex, highly stable over time, and can be very difficult to change.

**Table 2.4:** The dialectic (mutual constitution) of action/praxis and practice architectures (Kemmis 2009, p. 9)

<table>
<thead>
<tr>
<th>Action and praxis</th>
<th>Dimension/medium</th>
<th>Practice architectures (mediating preconditions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘Saying’ (and thinking)</td>
<td>The cultural-discursive dimension (in the medium of language)</td>
<td>Cultural-discursive structures, practice and relationships</td>
</tr>
<tr>
<td>‘Doings’ (and ‘set-ups’)</td>
<td>The material-economic dimension (in the medium of work)</td>
<td>Material-economic structures, practice and relationships</td>
</tr>
<tr>
<td>‘Relatings’</td>
<td>The social-political dimensions (in the medium of power)</td>
<td>Social-political structures, practices and relationships</td>
</tr>
</tbody>
</table>

Nicholls (2001) concurs with the work of Kemmis (2008b, 2009) and Hegarty (2008) and suggests that for change to occur within higher education and particularly with respect to academic development, the academic self and the academic community need to be considered. Arbuthnott (2009) suggests that ‘One of the most consistent findings in
social sciences is the degree to which human behavior is influenced by its immediate physical and social context (p. 156). Eckel and Kezar (2003) argue that individuals must be involved in sense-making to help them to see the role of change (Gioia & Thomas 1996). In their study of change in universities Eckel and Kezar (2003) used Weick’s (1995) seven properties of sense-making, and conclude that:

- Adopting new mental models is a cognitive and intellectual process, and simply relying on changing structures, policies, and reward systems will not achieve change.
- Institutional changes also rely on outsiders to play important roles.
- Leaving the responsibility for leading change to a few high-level administrators will not work.

For individuals to be able to make sense of their practice and identify areas where change is needed they must recognise that current practice might be problematic. Nicholls (2001) argues that for this to occur, the cultural environment, perturbation and commitment to change must be considered through a process of reflection. Change will result only when academics realise that their current practice might be problematic. Perturbation is an essential ingredient to activating reflective learning, whether it is about general academic practice, teaching or research.

Providing the support needed by individuals for change to occur is problematic in universities, given the competitive culture, which is often reinforced by research funding and academic promotion structures (Chappell 2007). Capacity and empowerment that allow for self-reflection and subsequent change need to be developed and nurtured through effort, will, initiative and leadership. These qualities are needed to involve and educate the university community to help shape opinion and to galvanise commitment to act. It is people and groups with these attributes who attract resources, compile information and shape ways for deploying resources to catalyse change (Frank & Smith 1999).

If change is to be experienced in learning and teaching, academics should be positively encouraged to be actively involved in the planning stages of innovations and curriculum developments, rather than be expected to perpetuate old teaching material and teaching
styles (Nicholls 2001). Consequently, an important task for leaders of strategic change within universities is to ‘frame that change in aspiration terms’ (Weick 1995, p. 398). In this context, image is important and can be identified through terms such as ‘prestige’, ‘status’, ‘impression’, ‘stature’, ‘visibility’, and ‘reputation’. Image and identity are also closely associated with a study conducted by Gioia & Thomas (1996), which examined change in a US university. In this study they identified the importance of symbols which are related to image and concluded that ‘symbols became the primary means by which participants grounded their perceptions and articulated their preferences concerning many aspects of strategic change’ (pp. 234–5).

The term ‘strategic change’ suggests that it is undertaken by an institution’s leaders, but Eckel and Kezar (2003) argue that the responsibility for leading change cannot be left with a few prominent administrators. This is confirmed by Chaffee and Jacobson (1997), who comment that:

> The stereotypical approach (to change of executive function, involving few people and implemented by orders) simply could not work in higher education, whether it worked elsewhere or not. Executive ownership, command and hierarchy have not been part of our culture in modern times (Chaffee & Jacobson 1997, p. 230).

Also, Eckel & Kezar (2002, p. 453) note that, by itself, leadership at the top is insufficient and that ‘staff development … was extremely important to the change processes …’. In their overall conclusions they report that it is not appropriate to present change strategies as universal principles for all institutions and the key finding for implementing change is that the ‘change strategies seem to be successful if they are culturally coherent or aligned with the culture’ (p. 457). Leaders of change regardless of their position need to observe their institutional patterns (Eckel & Kezar 2002).

Developing trust is an important element of aligning with the organisation’s culture (Keup et al. 2001). This can be achieved through open communication, and is facilitated when there is a history of ‘making decisions in a way that reflects a clear and sensitive understanding of the culture of a campus’ (Farmer 1990, p. 10). A second condition is the use of planning strategies that are open, participative, aligned with organisational culture and goals, and are long term (Kashner 1990). Conversation/communication between individuals and groups within the organisation, as they carry out their tasks, is
central to the development of trust and transparency in decision making (Keup et al. 2001). To bring about a fundamental change in people’s beliefs and behaviours, a change that would persist and that serves as an example to others requires the creation of communities around them where new beliefs can be practised, expressed and nurtured (Chappell 2007). This in turn requires empowered individuals and groups within organisations and can be guided by leadership and the creation of a community of practice where there are connections between people who share a concern, a problem or a passion and who want to deepen their knowledge and expertise in this area by interacting on an ongoing basis (Keup et al. 2001).

The combination of trust, transparent decision-making processes and clear ongoing communication amongst all members of the community will result in the development and sharing of knowledge and capacity for change. Information becomes knowledge only through people and their social engagement. People spark new ideas when they are in conflict, confused and searching for new meaning, yet remain willing to discuss and listen to each other to confront reality and the status quo (Stacey 2001). Progressive organisations constantly ask themselves troubling questions (self-reflection) and are connected to external systems which do the same (Wenger, McDermott & Snyder 2002). This cannot be achieved from central or heroic leaders only, but requires energy and the fostering of energy all over the place, i.e. distributed leadership (Stacey 2001). Stacey argues that

Knowledge is always a process, and a relational one which cannot be located simply in an individual head to be extracted and shared as organizational assets. Knowledge is the art of conversing, and learning occurs when ways of talking and therefore patterns of relationships change. The knowledge assets of an organization then lie in the pattern of relations between members (Stacey 2001, p. 98).

Higdon (2003, p. 64) has similar views. When considering new initiatives or responding to change within universities he advises:

1. Universities operate from within a set of customs and beliefs, which are linked to the performance of the particular institution. If the institution’s culture is interfering with its performance, then change is necessary. The only way to determine whether the culture, or belief system, is at odds with the success of the institution is to first learn all one can about the culture and its role in the institution.
Before beginning an initiative, it is advisable to examine the reasons behind it and distinguish between elements that need changing and those that do not. This allows for the definition of the values important to the success of the institution.

It is advisable to use early actions as opportunities to set the tone for change initiatives. Support from senior management is crucial to establish a collaborative style, and demonstrates openness and a willingness to listen. This allows for continuing dialogue on managing change from within. The more senior administrators meet with the people affected by a change initiative, the more they understand the issues beforehand, the more the barriers to that change initiative will break down. This initial demonstration of collegial style sets the right tone for collaborative leadership and builds trust. Moreover, the more people open up, the more they learn.

Cultural change takes place over a substantial period of time. For change to occur individuals must see that the need for it is maintained in the institution’s direction and leadership. Leaders must pace change to assure visible success without destabilising the community.

It is important to identify and support change leaders whose opinions are valued, and have the skills to both verbally support the changes and carry them out.

Adaptability and an open perspective should be maintained.

Clear and regular communication is necessary across all levels of the organisation.

The discussion to date has focused on change as it relates to universities, drawing from research specific to organisational change in higher education. The points identified are closely aligned with more general organisational change theory with a greater focus on grounding the change in organisational culture. Kotter’s (1996, p. 21) eight-stage process for managing organisational change illustrates this:

1. establishing a sense of urgency
2. creating a guiding coalition
3. developing a vision and strategy
4. communicating the change vision
5. empowering a broad base of people to take action
6 generating short-term wins

7 consolidating gains and producing even more change

8 anchoring (institutionalising) the new approaches into the culture.

Stages 6, 7 and 8 are about building momentum for change and consolidating it to enable further progress in achieving change, recognising that change needs to be embedded into the operating processes and procedures and the culture – ‘the way we do things’ of the organisation.

Writing about organisational change, Brockbank, McGill and Beech (2002), Senge et al. (2005) and Shani and Docherty (2003) identify similarities to Kotter’s eight-stage process for managing organisational change, arguing that if transformational change in organisations is to occur the following are required:

• a strong governance system and leadership, recognising participative models

• a strong sense of organisational purpose so that employees begin to value new things and seek new ways of operating

• encouragement of creativity

• reflection, allowing for the exploration of, and shift to, new mental models

• effective dialogue which seeks to create a culture that embraces change by decreasing and diluting resistance

• emotional engagement to connect with each other and the environment

• systems thinking, recognising the whole not just the individual parts of the organisation

• time resources and space to support and empower change

• double-loop learning, which builds on single-loop learning where an individual learns to do a task better and where new knowledge is integrated with old. Double-loop learning requires reflection and questioning of everyday assumptions and actions.
There is a link between curriculum change and organisational change: they both require adequate investment in time and commitment across all levels of the organisation. Cultural, political and policy barriers that exist within organisation must be addressed if curriculum change is to be successful and support is required from staff across the organisation (senior management and those at the ‘coal face’). Evidence of success needs to be clearly and honestly communicated to provide others with the confidence to participate, and any change initiative must consider the context and culture of the organisation. Finally, time for reflection and the ability to build on learning from change initiatives must be built into the change process if it is to be successful. The lessons learnt from research into organisational change in universities must be taken into consideration when thinking about academic development. Achieving change in teaching practice and the curriculum will require an understanding of the change process, both internal influences for change (including beliefs and concepts of teaching) and external influences for change (workplace dimensions and culture). Without this understanding, academic development programs are unlikely to create lasting change in teaching and learning for sustainable development.

2.6 Theoretical framework for sustainability education academic development (SEAD) programs in universities

Academic development in sustainability education is critical to provide academics with the capabilities and drivers to re-orientate their teaching praxis. The organisational structures and cultures that act as barriers to sustainability education need to be recognised and addressed if these programs are to be successful. If staff are to become proactive in their academic development, to question their teaching practice and to become critically reflective practitioners, then support by peers, administrators, institutional structures is required and time must be allocated to accommodate this process.

From the literature it has been possible to explore the theoretical structure and function of such programs in terms of optimising knowledge and skills that would most likely result in lasting change. I developed the following theoretical framework from this
literature review to identify the elements of an academic development program required for universities to guide the development of sustainability education praxis.

The SEAD framework (see Figure 2.3) is underpinned by three elements that were analysed in depth in the literature review: sustainability education (sections 2.2 and 2.3), academic development (section 2.4) and organisational change (section 2.5). The overlapping concentric circles represent that fact these three elements must be thought of as inherently interlinked, and academic development has a far greater change of being successful when approached from this perspective. Additionally, an exploration of worldview (section 2.1) was identified as underpinning each of the elements of the SEAD framework. For any shift in thinking to occur, an initial consideration and problematisation of existing worldviews must occur across the elements outlined in the SEAD framework above. Additionally, to achieve transformational change and the pursuit of sustainability educational praxis this reflection and reference to worldview must additionally include how knowledge is developed in the following:

- learning and teaching / instructional knowledge
- pedagogical knowledge
- curricular knowledge.

Theses must be critically reflected on against an individual’s worldview and all the elements of the SEAD framework if an academic development is to result in sustainability education.
The following section presents the key themes that emerged from the literature review to inform an academic development program for academics in any university and discipline with the greatest possibility of achieving lasting change. It is important to note that in this framework learning is defined as a creative, reflexive and participative process with a leaning towards ‘learning as change’, engaging the whole person and the whole learning institution (Sterling 2001).

2.6.1 Sustainability education

As identified in the literature review sustainability, sustainability development and related forms of education are contested and open to interpretation, the following presents the key characteristics, drawn from the literature review, of sustainability education as education that will result in transformative change. These should be used in any academic development program if third-order learning is to result.
**Definitions**

Definitions must begin with an understanding of the construction of knowledge and an examination of self. Understanding is linked to identity and experience and without this recognition and context, definitions become meaningless (Hegarty 2008; Sterling 2001).

Generic definitions of sustainability, sustainable development and education are not useful in assisting greater adoption of education in this field. Definitions must be explored in relation to an individual’s philosophical and epistemological foundation, and the current dominant scientific paradigm, and how this translates into pedagogy, practice and curriculum (educational praxis) (Bawden 1997).

Different definitions of sustainability education result in different levels of practice. Education for sustainable development, like environmental education, simply continues to reinforce (educate for) unsustainable ways of living rather than educating for change. Transformative change can occur only with sustainability education focused on achieving third-order learning (Sterling 2001).

Sustainability education praxis requires educators to understand the links between pedagogy, learning and teaching practice and curriculum development.

**Pedagogy**

Pedagogies must embed principles of deep learning and be interactive and student centred, typifying constructivist learning theories (Bennett & Dunne 1994; Stefanovic 2005; Summers, Childs & Corney 2005; Tilbury 2004).

As new and mixed pedagogies are explored, sustainability education praxis must include:

- participatory practice that allows the educators to focus on the experiences, backgrounds, talents, interests, capacities and needs of the students and on the best practices for enhancing motivation, learning and achievement for all students
- collaborative learning
- problem-solving skills to deal with complex real-life problems
• creative thinking

• critical thinking

• ability to question own assumptions

• ability to think systematically

• personal and professional self-reflection

• creative participation in inter-disciplinary teams and learning from others (collaborative learning)

• holistic thinking, recognition and appreciation of environmental, social, political and economic contexts for each discipline

• experiential learning by reconnecting to real-life situations (Dawe, Jucker & Martin 2005; HEA 2006; Sterling 2004).

Learning and teaching

Student learning must embody self-reflection and question personal values and identity. Learning and teaching activities and skills must be developed from a learner-centred pedagogy. Teaching strategies should include the advocacy of enquiry, involving investigation of differing viewpoints and value positions, discussion and debate, all of which should enable students to develop, express and justify their own views about sustainability issues (Huckle 2005; Sterling 2001; UNESCO 2005)

Subject content and activities must focus on inter-relationships between environmental, economic and social factors.

Curriculum

How sustainability is understood and practised by the educator will influence the sustainability content that is considered relevant and important to disciplinary knowledge and practice. However, there are four interdependent systems that require some understanding: the biophysical; the economic; the social and cultural; and the political (Fien 2001).
In order for these systems to be incorporated into curriculum that reflects second- and third-order learning, curriculum must be founded on the following:

- inter-disciplinary and intercultural practice
- discourse with much room for discussion, subject diversity and cross-cutting topics
- holistic and systemic approach, i.e. consisting of a mix of targeted activities, cognitive learning modules and emotional and practical experiences
- general components and the inter-connection of ecological/natural systems, social systems (including cultural and political) and economic systems to core curriculum
- key current and historical sustainability issues in their local, regional and international contexts
- issues relevant to the discipline that explore social justice, diversity and equity (Baud 2004; Fien 2001; Holdsworth et al. 2006b; Parker, Wade & Van Winsum 2004).

### 2.6.2 Academic development

Academic development for sustainability education should enable educators to develop sustainability education praxis. As highlighted in the SEAD framework this includes the development of pedagogical knowledge, instructional knowledge and curricular knowledge. These elements should be interlinked to form a central framework for exploring sustainability across the area of the scholarship of learning and teaching, as it relates to the unique culture and structure of universities (Kreber 1999). This approach must be grounded in a learner-centred pedagogy, as the learner must develop skills in critical practice, reflective practice and systemic thinking (Kemmis & Smith 2008).

**Pedagogical knowledge**

Key to the development of sustainability curriculum and learning and teaching practice is an understanding of the hidden assumptions through which meaning and knowledge are themselves constructed, and how this relates to our own professional and personal identity. Consequently, skills in engaging in reflective practice, lifelong learning, critical enquiry and understanding of systems theory must be part of the role of scholarship.
These skills will result in ‘deep learning’ and allow for the development of the academic’s own pedagogy and teaching practice (Cheetham & Chivers 1996; Halton & Smith 1995; Ho 2001; Kolb 1976; Rowland 2003; Schön 1988).

**Instructional knowledge (teaching and learning)**

Given that pedagogical knowledge directly informs instructional knowledge, action undertaken personally by the educator to assist with their own understanding about learning should then be built into their own instruction style and curricular materials (Kreber 1999).

**Curricular knowledge**

Given that curriculum content is developed from the individual’s own professional experience it is important for them to explore how their worldview and values lead to the determination of what is ‘important’. Consequently, when identifying and developing curriculum content that is relevant to the discipline, educators must attempt to ensure that content is inclusive of all worldviews or clearly acknowledges which worldview is being represented (Bowden 1989; Gibbs 1995; Gow & Kember 1993; Ho 2000; Kember & Kwan 1997; Pickering 2002; Ramsden 1992; Trigwell 1995).

Additionally, academic development programs must link the improvement of the scholarship of teaching and learning with the scholarship of research. Only then will the role of academic development be fully valued (Boyer 1990; Nicholls 2001; Rice 1992). Further, academic development programs need to be initially focused within the discipline as most academic staff identify primarily with their discipline, and each discipline shapes the way academics think about their teaching and learning. Assumptions that are particular to a discipline must be understood and explained (Barnett 1997; Healy & Jenkins 2003; Rowland 2003). Academic development is best received from developers within the discipline itself, as tension may exist between academic developers who sit outside of the area of change and are not perceived as experts in the discipline (Bradley 2000; Rowland 2003; Webb 1996).

Finally, to enable change in teaching praxis and practice, academic development should build on the following phases:
• confrontation: recognition that change is required, as current practice is not working

• self-awareness: recognition of own practice

• construction of alternative practices


2.6.3 Organisational change in universities to enable sustainability education

Because universities have a distinctive dominant culture, which needs to be understood in relation to its influence on the success of academic development programs, change can occur within universities, and particularly in relation to academic development, only if the academic self and the academic community are considered (Chappell 2007; Keup et al. 2001; Nicholls 2001).

Change will occur only when individuals are able to make sense of their practice, to recognise it as problematic and to appreciate the need to change (Eckel & Kezar 2003; Gioia et al. 1996; Weick 1995). Change must be led through the motivation and vision of those in management with visible and respected status. Strong governance and leadership is required that recognises the value of participative models and pursues effective dialogue, creating a culture that embraces change by decreasing and diluting resistance (Eckel & Kezar 2003; Nicholls 2001; Weick 1995). However, it cannot be solely left up to a few individuals in positions of authority.

For change to be successful, those implementing change on the ground must also be involved. This can occur only if there is clear ongoing communication and empowered communities are developed and included in transparent decision-making processes. Communities that share and learn from each other, recognise new beliefs and knowledge, have the confidence to question each other and work through confrontation are critical to this (Chappell 2007; Higdon 2003; Kashner 1990; Keup et al. 2001; Stacey 2001; Wenger, McDermott & Snyder 2002).

The change process must recognise the institutional culture, and there must be double-loop learning for transformational change to occur. Double-loop learning builds on
single-loop learning, where an individual learns to do a task better, by integrating new knowledge with old. Double-loop learning requires time, resources and space for employees to reflect, question everyday assumptions and actions, think systemically and explore new mental models (Brockbank, McGill & Beech 2002; Senge et al. 2005; Shani & Docherty 2003).

2.6.4 Exploration of our individual and collective worldview

The literature review identified key overlapping elements central to sustainability education, academic development and organisational change. Key to this is the exploration of our individual and collective worldview against the development of instructional, pedagogical and curricular knowledge, as it shapes our beliefs and practices (Fricker 2002; Robottom & Hart 1993). It is central to embedding sustainability in education, as our worldview will determine if our behaviour will change as our knowledge and skills increase. Consequently, the principles that should inform academic development program for sustainability education include:

- an exploration and recognition of participants’ values and theoretical perspectives, including the recognition of how this informs their understanding of
  - specialist disciplinary experience and knowledge (relative to learning and teaching practice and curriculum development)
  - the role and purpose of education as it relates to their discipline and more broadly to its role in society
- recognition of assumptions embedded into the thinking and practice within all disciplines
- recognition of the ethical consideration required in educational praxis
- discussion of the dominant scientific Western worldview and how this shapes graduate outcomes and resultant personal and professional practice (Fricker 2002; Gough, N. 1987; Hegarty 2008; Henn & Andrews 1997; Jucker 2002a, 2002b; Orr 2001; Robottom & Hart 1993; Sterling 1996; Stevenson 1987).
• discussion of participants’ identified disciplinary assumptions as they relate to other disciplines and legitimise other ways of knowing and being.

Central to this is that all participants undergo a process of deep learning to allow them to ascertain meaning and understanding from curriculum and their own experience, resulting in transformational change (Sterling 2001; Warbuton 2003). Not only is ‘deep learning’ central to sustainability education, but it is also critical to academic development. Academics must be able to engage with ‘deep learning’ themselves if they are to evolve both their teaching and disciplinary practice (Ho 2000; Rowland 2003). Key to participants experiencing ‘deep learning’ in any academic development program in sustainable education is:

• double-loop learning

• reflective practice, critical analysis and systems thinking

• lifelong learning.

_**Double-loop learning**_

Double-loop learning enables ‘deep learning’ and the desired outcome of transformative change. The fundamental element of double-loop learning is critical reflective practice, which is where learners, in this instance either as university students (in undergraduate programs) or academics (in academic programs), reflect on their values, actions and outcome and critically analyse these against alternative approaches to determine if the new learning requires changes to be made (Argyris & Schön 1974; Brockbank, McGill & Beech 2002; Ho 2000; Senge et al. 2005; Shani & Docherty 2003; Sterling 2001).

_**Reflective practice, critical analysis and systems thinking**_

The skills of reflective practice and critical analysis enable learners to identify their own assumptions, to analyse the discourse that shape the hidden curriculum, and to challenge these. Sterling (2003, p. 9) argues that ‘systems thinking involves an extension of perception, a quality of connection in our conceptual thinking, and integration in our planning and actions towards healthy systems’. Reflective practice, critical analysis and systems thinking enable the identification of disciplinary assumptions and the rethinking and situating of one’s own conceptions of academic
practice, understanding of sustainability, the facilitation of student learning, as well as the structure and culture of universities (Argyris & Schön 1974; Chappell 2007; Fien 2001; Kolb 1976; Parkin et al. 2004; Rowland 2003; Sterling 2001).

*Lifelong learning*

If we are to change conceptions of academic practice, facilitate student learning and ensure sustainability content and skills are included in the curriculum we need to recognise that academics are both teachers and learners. Not only do we need our students to be lifelong learners, but we need our academics to be lifelong learners, both in their disciplinary expertise and in their teaching and learning practice (Chappell 2007).

The SEAD framework developed from the literature has been used as a theoretical model of best practice in sustainability education and academic development in this research. It has been used to ground current ‘best practice’ approaches in sustainability education and academic development occurring globally to determine its efficacy and practical application. The following chapter discusses the methodology used in this research and explains how the framework has been used in the research process.
3 Methodology

3.1 Theoretical framework and ontology

Underlying any research methodology are many assumptions that influence the research and its outcomes. As stated by Hammersley (1995):

... research may be seen as political, in that what counts as knowledge within any research community will have been shaped by the values of that community and by those of the other communities to which researchers belong (Hammersley 1995, p. 112).

The researcher's values and assumptions shape their theories about human nature and reality (ontology), and about knowledge (epistemology), and especially the purpose and significance of their research (Mason 2002). Crotty (1998) argues that our view of the human world, its grounding in our social life and resultant assumptions comprise our theoretical perspective — epistemological, ontological and methodological, all of which inform one another. When we acknowledge our assumptions we improve our understanding of our own theoretical perspective.

To understand a researcher's theoretical perspective we need to identify the way they view the world and make sense of it. Conventionally, there are three main epistemological stances:

- **Objectivism**: Meaning and meaningful reality exists apart from the operation of any consciousness. Understanding and values are considered to be objectified, and we can discover the object truth (Crotty 1998).

- **Constructivism/interpretivism**: There is no objective truth waiting to be discovered; truth or meaning come into existence in and out of our engagement with the real world. There is no meaning without mind, and it is constructed. Subject and object emerge as partners in the generation of meaning (Crotty 1998).
Methodology

- **Subjectivism:** Meaning does not come out of the interplay between subject and object, it is imposed by the subject on the object. The object makes no contribution to the generation of meaning (Crotty 1998).

There is a close association between perception and epistemology – between how we see and how we know (Crotty 1998; Sterling 2003). Perception is influenced and shaped by what we see and participate in, and by culture and society, and it is informed by epistemology. Sterling (2003) argues that if we view perception as knowledge constructed without evidence, but simply from our own values and beliefs, it is very difficult to deconstruct and change. Consequently, Sterling (2004) defines ‘epistemology’ as the operative way of knowing and thinking that frames people’s perception of and interaction with the world. He argues that it is important to see worldview, perception and epistemology, ethos and ethics all operationally associated rather than as separate. Sterling (2004, p. 85) argues that the ‘operational epistemology’ or “knowledge system” of the techno-scientific worldview, which is dominant in our society, is essentially positivist, objectivist and reductionist. In this research I have used the term epistemology as defined and understood by Sterling (2004) and Crotty (1998).

In philosophy, ontology is concerned with ‘the assumptions about existence underlying any conceptual scheme or any theory or system of ideas’ (Flew 1979, p. 256). A fundamental ontological question is: What is reality? To explore notions of whether we see knowledge as absolute, separate from the knower and corresponding to a knowable, external reality or if we see it as part of the knower and relative to the individual’s experiences with their environment, thus has far-reaching implications (Crotty 1998). While Crotty argues that ontology sits alongside and informs our epistemology, or theoretical perspective, he believes that our theoretical perspective embodies a certain way of ‘understanding what is (ontology) as well as a certain way of understanding what it is to know (epistemology)’ (Crotty 1998, p. 10). Ontological and epistemological issues tend to emerge together, ‘to talk of the construction of meaning is to talk of the construction of meaningful reality’ (Crotty 1998, p. 10). Crotty (1998) suggests that realism (an ontological notion asserting that reality exists outside the mind) is often taken to imply objectivism (an epistemological notion asserting that meaning exists in objects independently of any consciousness) as an example of the
relationship between the two. Crotty (1998) argues that constructivism is at once a realist and relativist ontology. To say that meaningful reality is socially constructed is not to say that it is not real. However, constructivism is also relativist in that what is said to be ‘the way things are’ is really just ‘the sense we make of them’. Sterling (2003) adds to this by suggesting that ontology is our lived, or operational, sense of reality.

This interpretation is of particular relevance to this research, as Hegarty (2008) argues that disciplinary ‘epistemologies are the raison d’être which disciplines hold for themselves and the scholars within their communities’ (p. 689). The way different disciplines construct knowledge shapes their understanding of sustainability and determines the extent of the challenge to embed sustainability into academic practice.

The research methodology adopted here is informed by a constructivist/ interpretivist paradigm. This methodology will be employed to determine the foundations of academic development programs in sustainability education. This framework has been developed from the literature in areas of education, sustainability and organisational change theory as it relates to academic development in universities, and will be grounded in real world experiences described in three case studies. Consistent with an interpretivist methodology, knowledge will be sought with an inherent understanding that truth or meaning only comes into existence in and out of our engagement with the realities in our world (Denzin & Lincoln 2005). Subject and object emerge as partners in the generation of meaning. Understanding of the social world from this perspective can only be obtained from first-hand knowledge of the subject under investigation (Crotty 1998). This approach emphasises the analysis of the subjective accounts that one generates by ‘getting inside’ situations and involving oneself in the everyday flow of life. Consequently, many of the insights of this research have resulted from my working within the case study programs.

### 3.2 Research framework

#### 3.2.1 Research aims, questions and objectives

The aim of this research is to develop a framework for academic development (AD) programs in sustainability education in universities that are more likely to result in lasting change for sustainability.
The overarching research question is: How should academic development programs in universities be designed to support the delivery of sustainability education? There are further sub-questions and objectives associated with the four phases of the research (see Table 3.1).

### Table 3.1: Sub-questions and objectives

<table>
<thead>
<tr>
<th>Phase</th>
<th>Sub-questions</th>
<th>Objectives</th>
</tr>
</thead>
</table>
| 1 Conceptualisation of a theoretical framework | • What might be the elements of an academic development program for universities underpinned by a sustainability education paradigm, to provide academics with the skills to develop sustainability pedagogy, instruction and content?  
• What is the structure of an academic development program for universities that will best affect change in the participant and affect change in the university itself? | • To support and guide the development of sustainability educational praxis from current practice.  
• To determine the structure of academic development programs that embody principles of organisational change (both curriculum development and institutional learning/change) to ensure that academic development programs are efficient and achieve transformation in the individual, the institution and eventually the profession. |
<p>| 2 Case studies of best practice in academic development for sustainability education in universities | • How effective are the different approaches that have been used in a range of academic development programs to support the delivery of sustainability education in universities? | • To explore a sample of three case studies that use different academic development approaches to support sustainability education in universities. |
| 3 Grounding the | • Which approaches to | • To critically evaluate the |</p>
<table>
<thead>
<tr>
<th>theoretical framework in real-world case studies</th>
<th>academic development are more likely to effect change in universities?</th>
<th>different approaches to academic development for sustainability education from the case studies against the theoretical framework developed in phase 1.</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 Synthesis</td>
<td>• To identify the key elements of a framework for academic development programs in sustainability education that are more likely to result in lasting change in universities.</td>
<td></td>
</tr>
</tbody>
</table>
academic development and their ability to achieve wider organisational change within universities.

Finally, the results of the case studies were used to ground the theoretical framework, and identify the features of academic development programs that are most likely to result in lasting change for sustainability. Based on the theory presented in the first phase and the findings from the case studies, a ‘best practice framework’ was developed to guide future academic development programs in universities.

### 3.2.3 Assumptions

The following are the key assumptions that underpin my research:

1. There is an urgent need for a change in our behaviour to ensure we do not degrade our social and environmental capital in pursuit of the development of economic capital.

2. Although it is not the only solution to our current problems, formal Western education is positioned as one of a number of tools for moving towards a more sustainable society (Jucker 2002b).

3. Within the field of formal education, educational praxis is being replaced by educational practice.

4. Education must provide learning experiences that facilitate a change of perspective so that we can ‘see’, ‘know’ and ‘act’ differently (influenced by the work of Sterling 1996 and Robottom & Hart 1993).

5. The dominant worldview that is upheld by society and educationalists today is underpinned by a scientific/positivist worldview (Capra 1982; Fisher 2002; Robottom & Hart 1993; Sterling 1996; Schumacher 1973).

6. Changing knowledge and values does not automatically result in a change in behaviour (Kemmis 2008b; Murray et al. 2007).

7. The formal Western education sector is the best place to begin research in this area.
3.3 Case study methodology

This research uses case studies as the foundation of its inquiry. Case studies provide a systematic way of looking at events, collecting data, analysing information and reporting the results. Case study research also reflects my theoretical perspective as it allows for the determination of truth or meaning from engagement with the reality of ‘my’ world, participating within the case study programs. Case studies have become one of the most common ways to do qualitative research, providing an opportunity to develop rich contextual data from which it is possible to generalise to theory, providing in-depth insight into social processes (Bryman & Burgess 1999). Yin defines a case study as

- an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially
- when the boundaries between phenomenon and content are not clearly evident (1994, p. 13).

Yin states that case study inquiry

- copes with the technically distinctive situation in which there will be many more variables of interest than data points, and as one result
- relies on multiple sources of evidence, with data needing to converge in a triangulating fashion, and as another result
- benefits from the prior development of theoretical propositions to guide data collection and analysis (1994, p. 13).

Flyvbjerg argues that case study research produces context-dependent knowledge necessary for deep learning to occur and that humans develop knowledge not from epistemic theoretical knowledge, but from context-dependent knowledge. Flyvbjerg therefore recognises the role of case studies in producing rich and useful knowledge and states that

Predictive theories and universals cannot be found in the study of human affairs. Concrete, context-dependent knowledge is therefore more valuable than the vain search for predictive theories and universals (2004, p. 423).
One major critique that is made of case study methodology is the lack of generalisability of the findings (Flyvbjerg 2004). This research uses multiple case studies enhancing the external validity, or generalisability, of the findings (Merriam 1998). The case studies were selected using an information-oriented sampling approach to allow for generalisation (Flyvbjerg 2006). There are three types of information-oriented cases: extreme cases, critical cases or paradigmatic cases. This research uses critical case selection; as a critical case has strategic importance in relation to my research problem (Shepard & Greene 2003). Case studies are selected with the following purpose: ‘To achieve information that permits logical deductions of the type, “If this is (not) valid for this case, then it applies to all (no) cases”’ (Flyvbjerg 2006, p. 230).

Evidence from case studies may come from six sources: documents, archival records, interviews, direct observation, participant observation and physical artefacts (Merriam 1998; Yin 1994). This research used three of these sources: interviewing, document analysis and participant observation, although the latter is relied on less heavily. The research also uses surveys as a way of collecting information about past events. The in-situ investigation of each case study involves observing what is going on, talking formally and informally with people, and examining documents and materials (Yin 1994). During the data collection phase I spent time working within each organisation. Some of the strengths and weakness of these research methods are outlined in Table 3.2.
<table>
<thead>
<tr>
<th>Source of evidence</th>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
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</table>
| Documentation       | - Stable – can be reviewed repeatedly  
- Unobtrusive – not created as a result of the case study  
- Exact – contains exact names, references, and details of an event  
- Broad coverage – long span of time, many events, and many settings | - Retrievability – can be low  
- Biased selectivity, if collection is incomplete  
- Reporting bias – reflects (unknown) bias of author  
- Access – may be deliberately blocked |
| Interviews          | - Targeted – focuses directly on case study topic  
- Insightful – provides perceived casual inferences | - Bias due to poorly constructed questions  
- Response bias  
- Inaccuracies due to poor recall  
- Reflexivity – interviewee gives what interviewer wants to hear |
| Participant Observation | - Reality – covers events in real time  
- Contextual – covers content of event  
- Insightful into interpersonal behaviour and motives | - Time-consuming  
- Selectivity – unless broad coverage  
- Reflexivity – event may proceed differently because it is being observed  
- Cost – hours needed by human observers  
- Bias due to investigator’s manipulation of events |

A combination of qualitative and quantitative research methods was used in each case study. While quantitative research methods traditionally do not fit with an interpretative methodology, the selection of research methods depends on the research questions, the research situation, and other practicalities. Bryman & Burgess (1999) perceive quantitative and qualitative research as complementary rather than oppositional, and recognise that they are increasingly used together within a single research study.
The use of multiple sources of evidence (triangulation) ‘allows an investigator to address a broader range of historical, attitudinal, and behavioral issues’ (Yin 1994, p. 92). It also allows for the development of converging lines of inquiry: ‘Thus any finding or conclusion in a case study is likely to be much more convincing and accurate if it is based on several different sources of information’ (Yin 1994, p. 92). One of the major benefits of case study research is the opportunity to use multiple research methods.

3.4 Research methods

Three case studies of globally recognised sustainability education programs for tertiary educators were undertaken. Data collection focused on areas identified in the theoretical framework as important to academic development for sustainability education, namely:

- the nature of the program
- the historical background of the program
- the physical setting
- the context of sustainability education within the program:
  - the scale/scope of the program
  - the approach taken to professional development and curriculum/organisational change
  - conceptualisations of sustainable development
  - the extent to which they are effective
- factors contributing to the effectiveness of the program.

Case studies were selected to ensure that a range of different approaches to academic development were captured, so that the research findings would be applicable to other cases. As stated by Platt (1988), case study analysis can prove a very useful research methodology when there is an appropriate rationale for selecting case studies. In this instance, case studies were selected to capture the heterogeneity in the population, to
examine cases that are critical for the theories being studied, and to establish particular comparisons to identify reasons for differences between settings or individuals (Maxwell 2005).

The approach used in this study was to identify academic development programs for sustainability education that have innovative ideas and have been successful in engaging and empowering individuals and creating an environment of change leading to alternative and informed practice. The following organisational characteristics informed the selection of the case studies: profile and reputation; approaches to sustainability education; the ability of the organisation to influence change from within using policy development; research profile; commitment to community engagement and empowerment. Each case study approached these elements differently allowing the SEAD theoretical framework, developed from the literature, to be grounded in ‘real-life’ practice, enabling the deduction of a best-practice approach to academic development in sustainability education.

Additionally, the organisations chosen as case studies were selected because they are all globally recognised as furthering the sustainability education agenda within universities through their academic development programs for sustainability education:

- Beyond Leather Patches Sustainability Education: RMIT University, Australia
- Youth Encounter with Sustainability: Alliance for Global Sustainability, Swiss Federal Institute of Technology Zurich, Switzerland

The aims of each case study were to:

- understand the course design and impact of the program’s learning goals and their achievability
- determine the effectiveness of delivery mechanisms by identifying the program strengths and weaknesses
• determine whether the desired/prescribed outcomes of the program were being achieved

• determine the impact of curriculum materials on stakeholders.

Each case study captures the perspectives of program participants, staff and others associated with the program, exploring their experiences, their expectations and changes resulting from the experience. The evaluation strategy is based on a participant-oriented model, which emphasises the central importance of the understandings of participants. Outcomes of the academic development programs were examined by describing and assessing what happened after delivery of the program.

3.4.1 Semi-structured (standardised), open-ended interviews

This method actively generates data with participants, and is one of the most important sources of case study information. Where it was possible to interview face-to-face, semi-structured, open-ended interviews were employed. Where this was not possible, attitudinal surveys were employed to retrieve information (Yin 1994). I was able to conduct face-to-face interviews with employees of each organisation within the study as I worked within each organisation. Working with each case study in a voluntary capacity provided access to individuals who were important to the operations of the group and programs.

The semi-structured, open-ended style of interviewing ensured that I gained an understanding of the interviewees’ meanings and views of their social world (Patton 2002). Additionally, the use of semi-structured, open-ended questions has the following features:

• The exact instruments used in the evaluation are available for inspection by those who will use the findings of the study.

• Variation among interviews can be minimised where a number of different interviewers must be used.

• The interview is highly focused so that interviewee time is used efficiently.
• Analysis is facilitated by making responses easy to find and compare (Patton 2002, p. 346).

This approach reduces the problems of legitimacy and credibility regarding qualitative data (Patton 2002).

The interview questions were written to avoid jargon, slang and abbreviations, and to avoid ambiguity, confusion, vagueness, emotional language, bias and leading language (Neuman 2000). A full list of interview questions can be found in Appendix A. The interview questions were structured to flow around the following topics:

• organisational structure and operations

• sustainability education content

• participant’s learning environment and experience

• barriers/obstacles.

Each interview was digitally recorded and notes were taken during the interview; the recordings were transcribed for coding and analysis. Transcription is defined here as the graphic representation of selected aspects of the behaviour of individuals engaged in a conversation (Kowal & O’Connell 2004). The aim was to represent on paper as accurately as possible the strings of words uttered. The data were analysed by organising it into categories on the basis of themes, concepts or similar features. The conceptualisation, or development of concepts, occurs when qualitative researchers read through and ask critical questions about the data. In case study analysis, ideas and evidence are mutually interdependent (Neuman 2000; Punch 1998).

Three stages of qualitative coding were used in the transcript analysis (Flick 2009; Neuman 2000; Punch 1998; Strauss & Corbin 1990):

• Open coding was used first to locate themes and assign initial codes in an attempt to condense the mass data.

• Axial coding is the second stage where the focus is on the initial coded themes rather than the data (Flick 2009). Additional codes may emerge during this phase,
but the primary task is to review and examine initial codes, organisation of themes and the identification of the axis of key concepts in analysis (Neuman 2000).

- Selective coding involves scanning data for cases that illustrate themes and making comparisons and contrasts after the data has been collected (Neuman 2000).

The development of codes follows the structure discussed in Neuman (2000). The codes were made up of five parts: a label; a definition with a main characteristic; a ‘flag’ description of how to recognise the code in the data; any exclusions or qualifications; and an example (Punch 1998).

### 3.4.2 Participant surveys

As part of the case study evaluation it was considered important to hear from those who participated in the academic development programs. The academic development programs included in the research had already occurred so observing them as they happened or interviewing the participants face to face was not possible. Hence participants were surveyed via a weblink communicated to the participants by an email. Conducting an email survey enabled me to reach many of the participants, as they were scattered across the globe, and provided the best chance of achieving a high response rate. The survey featured a combination of qualitative and quantitative questions. A five-point Likert scale (Foddy 1994), forced-choice questions coupled with open-ended questions comprised the survey, this allowed for the exploration of responses to the various academic development programs. These questions complemented those being asked in the face-to-face interviews and were grouped into the following categories:

- attitudes to and understanding of sustainability education
- participant experiences within profession development programs in sustainability education
- experiences in developing curriculum and teaching sustainable development
- perceived need for sustainability education by graduates and industry.

The open questions allow respondents to express themselves in their own words without influence from the researcher, while closed questions allow the researcher to compare
answers to the same questions from different participants. Using a combination of both quantitative and qualitative methodologies minimises the biases associated with each method when used alone (Foddy 1994). Closed questions used a Likert scale, which allows the researcher to measure the strength of a respondent’s attitude. These questions consisted of sets of statements about elements of the course accompanied by a rating scale, which ranged from 1 (strongly disagree) to 5 (strongly agree). Respondents were instructed to select the response that best reflected their position on each item. Individual responses were then given total scores on the basis of the sums of their ratings.

The participants were identified by the case study organisations. A complete list of survey questions is presented in Appendix B. The quantitative questions were analysed using the Statistical Package for the Social Sciences (SPSS)\(^3\) and the qualitative questions were analysed using the same coding approach described for the semi-structured interview questions.

### 3.4.3 Documentary research and analysis

Documentary information is relevant to almost all case studies and is useful for corroborating and augmenting evidence from other sources (Yin 1994). Documentary research and analysis was used to review publically available documents relating to the work of each organisation and to collect both qualitative and quantitative data to compare with the findings from the interviews and surveys.

The criteria used to select documents draws on Gottschalk et al.’s (1945) checklist to determine accuracy of documents:

- Was the ultimate source of the detail (the primary witness) able to tell the truth?
- Was the primary witness willing to tell the truth?
- Is the primary witness accurately reported with regard to the detail under examination?
- Is there any external corroboration of the details under examination? (Gottschalk et al. 1945, p. 35)

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\(^3\) SPSS for Windows, Rel. 11.0.1, SPSS Inc., Chicago, 2005.
Denscombe (1998) furthers this by suggesting that researchers need to consistently consider authenticity (Is it the genuine article rather than a fake? Is it credible, representative? What are its written and unwritten meanings?). The analysis of documents involves asking relatively open-ended questions about the texts and the theoretical categories that emerge out of the data. The researcher’s role is to continuously reflect on the emerging categories and link these with the data (Bryman & Burgess 1999). A complete list of documents used is presented in Appendix C.

3.4.4 Participant observation

Participant observation was used to understand the experiences, culture and rationalisation for work and initiatives conducted within each case study. Observations were undertaken as ‘observer-as-participant’. I was known within each organisation as a researcher who was also actively part of the organisation’s daily activities (Dane 1990). In this mode of observation I assumed a variety of roles and participated in the events being studied. Participant observation provides certain unusual opportunities for collecting case study data, but it also involves problems such as potential bias and modification of activities to achieve certain outcomes. To limit these potential problems, I made my observations as unobtrusively as possible. The benefits of participant observation include the ability to gain access to groups that would not otherwise be accessible; this allows the researcher to perceive reality from the view of someone inside the organisation.

3.5 Ethics

When researchers select a problem for study, they wittingly or unwittingly choose a set of methodological and ethical problems which will accompany their efforts every step of the way (Hammersley 1995). Ethical conduct derives from a way of seeing and interpreting relationships. In this process, formalised codes of professional ethics act as prompts by alerting research workers to important considerations and broad dimensions of behaviour. It is also important to limit the amount of bias associated with data collection to ensure that the research findings are not shaped by the involvement of the researcher. Kellehear (1989) believes this can be achieved by approaching research in
a way that is non-intrusive, extending diplomatic behaviour to all individuals, regardless of their political and ethical affiliations.

At all stages of the study, I took steps to ensure that the research was conducted in an ethical manner. I gained permission from each organisation to use their programs in a case study. Each organisation agreed to allow me to work with them for a period of time. I ensured that all members of the organisations were aware of and understood the purpose of the research. Participation in the study was voluntary, and each participant had the right to withdraw from the study without penalty. I have kept each organisation up to date with the progress of my research, and have provided all participants with copies of my findings. No individual who was observed or interviewed or who completed a survey has been identified in this research and any participation was formally agreed to by the signing of a consent form. All data collected will be kept for five years after publication of this thesis.

Ethics approval from the RMIT Human Research Committee was successfully gained for this research (HREC A8500606).

### 3.6 Case studies of sustainability education academic development for tertiary educators

These case studies are discussed in detail in chapters 4, 5 and 6, but an overview of the programs that were investigated is presented below.

#### 3.6.1 Beyond Leather Patches (BELP): Sustainability Education at RMIT University, Australia

This case study describes and evaluates the process and outcomes of an action learning research project undertaken at RMIT University, Australia, during 2005 entitled ‘Beyond Leather Patches’ (BELP). The research project was designed to embed sustainability principles in the curriculum of non-traditional disciplines. The project represented significant cross-campus collaboration between three schools at RMIT: the School of Property Construction and Project Management; the School of Management; and the School of Social Science and Planning. Its focus was the creation of a holistic vision of sustainability, defined in the context of the disciplines involved, understood in
relation to the limitations and opportunities presented in societal practice, and taught in a way that is progressive rather than reactive. The project provided assistance in the identification of systemic links across the schools where relevant sustainability capabilities and theory could be linked to course content. In turn there were opportunities for assisting student development through the creation of their own vision of sustainability, and shaping it in relation to their chosen discipline and its professional practice.

The BELP project drew on the insights of previous attempts to address sustainability education at RMIT and sought to achieve lasting change in organisational structure and operations and curriculum content. The project resulted in several tangible outcomes, including 16 new and revised courses in a range of discipline areas, and the development of a flexible change framework to assist the establishment of sustainability content into curricula.

3.6.2 Youth Encounter on Sustainability and Educators Seminar on Teaching Sustainability: ETHsustainability, Zurich, Switzerland

In the year 2000 the Alliance for Global Sustainability (AGS)\(^4\) started an initiative, under the title of the Youth Encounter on Sustainability (YES), to realise two-week summer courses in a small mountain village in Switzerland. The aim was to bring together students from all over the world to discuss, debate and share diverse cultural and disciplinary experiences. A key learning objective was for the students to plan their own visions of a sustainable world and to explore their roles as emerging leaders. The YES course concept has since been expanded to other regions of the world, and to date, more than 750 students from over 90 different countries have been educated in the program.

The education for sustainable development (ESD) model behind the course is founded on students developing basic knowledge of the natural sciences and technology, and an understanding of economic, political, social and cultural structures. This is coupled with the exploration of ethical and moral frameworks and the nurturing of core skills to

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\(^4\) Founded in 1997, the AGS is a unique university partnership between the Swiss Federal Institute of Technology (ETH) in Zürich, the Massachusetts Institute of Technology (MIT), Chalmers University in Gothenburg and the University of Tokyo (UT). The goals of the AGS are the promotion of inter-cultural, interdisciplinary and practice-oriented research of global relevance, the support of education in the area of sustainable development, and the development of networks with the ability to influence international decision making.
develop the capacity for participants to successfully devise solutions to global problems. The entire learning process is grounded in concepts of social and experiential learning, making the program a unique example of ESD theory put into practice.

Since the development of the student education program the AGS has developed a pilot educators program entitled Education for Sustainability Teachers Seminar (ESTS), founded on the student model. This case study presents the content framework, pedagogical methodologies and learning objectives that lie behind both programs. This approach has been evaluated through both long- and short-term attitudinal surveys conducted with participants in the program. The findings presented in this case study seek to illustrate how the YES program is experienced by both students and educators in line with the program’s learning objectives, and how this translates into their personal and professional lives.

3.6.3 Forum for the Future, UK

Forum for the Future works with leading businesses, all levels of government, the post-school education sector and professional bodies through a range of partnerships and projects. Forum’s aim is to develop new policy and practice with organisations and sectors to meet sustainability challenges, in a way that shares learning and experience amongst partners, within the higher education and broader education sector generally, and between Forum’s partners in other sectors. Forum for the Future’s education and learning program ran a series of initiatives to address all of the components of organisational change they believed are required by the higher education sector to successfully embed sustainability into both operations and curriculum. The programs were devised in a way that embodied a strategic ‘whole of sector’ approach to sustainable development and aimed to create sector-wide change. Forum’s education and learning programs supported the development of leadership to contribute to sustainable development, provided strategies that delivered, developed and disseminated guidance documents and practical tools, and influenced national policies and developed cross-sector links to explore and facilitate how ‘sustainability literacy’ could be built into the curriculum.

Forum for the Future’s formal work around sustainability education within higher educational institutions (HEI) began in 1999 with the Higher Education 21 (HE21)
program and continued with the Higher Educational Partnerships for Sustainability (HEPS) from 2000 to 2003. HE21 took a directive approach to curriculum change, presenting universities with documents specifying ‘what sustainability learning is required by different professions’ (Ali Khan 2002, p. 15), and HEPS worked on both estates-management and curriculum aspects of sustainable development, producing a curriculum development toolkit which offered institutions a route to the production of their own, context-specific, course content and pedagogy. This partnership demonstrated that sustainable development was compatible with other strategic objectives and created a practical toolkit and bank of experience to enable the rest of the sector to follow its example, whilst providing proof to policy makers that SD policies can be integrated into HEI operations (Forum for the Future 2004a).
4 Case study 1: Beyond Leather Patches, education for sustainable development at RMIT University, Melbourne

4.1 Introduction

The Beyond Leather Patches (BELP)\(^5\) project was a one-year action research project conducted at RMIT University in Melbourne, Australia, in 2005. The aim was to embed sustainability capabilities into core curricula at RMIT. The project was designed to create lasting change in both organisational structure and operations and curriculum content, and it sought to determine the key mechanisms required to turn sustainability curriculum innovation into embedded practice. The objectives of the project were:

- to understand the drivers for and barriers to curriculum change
- to undertake a series of action research projects aimed at applying organisational learning and cultural change processes for embedding sustainability into the curriculum of a university
- to develop a flexible change framework for sustainability education for use by other academic units and universities
- to make general recommendations about the types of models and approaches that can influence organisational learning and change for sustainability (Holdsworth et al. 2006b).

The BELP project team comprised five academic staff from three schools at RMIT University. Two academic supervisors from the School of Global Studies, Social Science and Planning worked to achieve a wide level of engagement across the university and provided knowledge and experience of teaching sustainability. A project coordinator

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\(^5\) The Beyond Leather Patches project’s title drew on the Beyond Grey Pinstripes research survey undertaken by the Aspen Institute Center for Business Education, which ranks business schools that have developed MBA programs which lead the way in the integration of issues concerning social and environmental stewardship into the curriculum.
developed and coordinated the project methodology and assisted the project team by providing resources and developing curriculum materials. The action research projects took place in the School of Property, Construction and Project Management and the School of Management. Within each school an academic champion was engaged to provide peer support. Their role was vital as they had insight into the culture of their school, an understanding of the discipline area and assisted in the identification of potential subjects for embedding sustainability content. Importantly, the champions supported staff from within, so the project was not seen as being orchestrated by outsiders. The heads of each school supportive of the project, the projects champions, and the project team supported those working within the schools.

The BELP project adopted an action learning methodology and followed Marquardt's (1999, 2004) approach, built around six components:

1. a problem or challenge of importance to the group
2. a group of 4–8 members of an organisation
3. a process that emphasises questions and reflection
4. the power to take action on strategies developed
5. a commitment to learning at the individual, team and organisational levels
6. an action learning facilitator who focuses on and ensures that time and energy are devoted to capturing the learning and improving the skill level of the group.

These six aspects were embodied in BELP through three phases: sustainability course audits, action learning workshops, and action learning groups.

This chapter presents a critical evaluation of the success of the BELP project in creating embedded, lasting change in terms of the ability of academics to develop and teach sustainability curriculum. The success of the project is assessed in terms of its structure and approach to change management, how sustainability education was defined and subsequently embedded into curricula, and how this material was then experienced by the relevant student cohort. The evaluation of the BELP case study is structured around
the key elements of the sustainability education academic development (SEAD) framework for best practice developed in the literature review, which include:

- an ability for all involved to understand and reflect on their own construction of knowledge and worldview
- how sustainability is defined and understood as it relates to education
- approaches to academic development
- organisational change to support sustainability education in higher education.

### 4.2 BELP case study methodology

The evaluation of the BELP program has been guided by an interpretivist paradigm and uses both qualitative and quantitative research methods, including documentary research, semi-structured interviews and the use of student course evaluation forms.

Semi-structured interviews were undertaken with five of the seven project team members. Two members of the project team were not interviewed; one team member was not available and another (the researcher of this thesis) was not interviewed as their experiences as the BELP project officer are embedded within the findings of this case study. The interviews focused on the participant’s understanding of the project’s aims and the role of the project team, their approach to change and success, obstacles and opportunities. All participants had different roles, and their insights provide a holistic understanding of the program, and enabled the identification of short- and long-term outcomes. The semi-structured interviews were designed to gain access to the interviewees’ meanings and hence the way in which they view their social world (Denzin & Lincoln 2005). The approach recognises that being flexible about the direction of the conversation will result in the most useful information. A complete list of interview questions is presented in Appendix A and a summary of the semi-structured interviews is presented in Appendix D.

The findings from the interviews were triangulated against the findings from documentary research to ascertain if the stated program structure, methodology and content was consistent. A list of documents used is presented in Appendix C.
To ascertain how the new curriculum developed was experienced by students a selection of questions from course evaluation surveys was analysed. Two courses taught in the School of Property Construction and Project Management in 2006 were evaluated: BUIL 1217 Research and Sustainability; and BUIL 1161 Affordability and Sustainability Study Tour. These courses were modified to include sustainability content as a direct result of the BELP project. The student evaluation of courses was undertaken using a mix of both open and closed questions discussed in chapter 3 (see Appendix E). The total scores for each survey were taken to indicate the respondents’ positions regarding that element of the course. The response rate to the survey of BUIL 1217 was 71 per cent and for BUIL 1161, 90 per cent.

4.3 Findings

A complete set of responses from interviews, documentary analysis and surveys is provided in appendices C, D and E. The discussion below presents key findings from the BELP project, using descriptive narrative and statistical analysis of participants’ experiences.

4.4 Approaches to sustainable education

4.4.1 Definitions of sustainability education

The BELP project team recognised that there is currently much debate over sustainability terminology, and that the construction of meaning has implications for how it is taught, what purpose drives the teaching, and what disciplines choose to see it as relevant (Calder & Clugston 2003). Academic institutions define and approach sustainability and sustainable development differently, which reflects their cultural, bioregional, economic, political and disciplinary diversity. In order to teach sustainability without the bias of unacknowledged assumptions, academics need to develop a deeper understanding of sustainability. Consequently, the project did not try to enforce a definition, but encouraged academics to develop their own definition in relation to the limitations and opportunities presented in disciplinary and societal practice. During interviews, the project team commented that it was important when discussing sustainability with academics not to enforce a definition, but to allow individuals to
determine definitions of sustainability and relevant concepts themselves. The team recognised that this allowed participants to engage in the project on a level they felt comfortable with. This approach recognises that personal experience plays a key role in the relationship between sustainability educational theory and practice.

### 4.4.2 Approaches to sustainability praxis: pedagogy, learning and teaching, and curriculum development

The BELP approach to education was founded on the premise that students need to engage in the creation of knowledge rather than just receive information presented by the educator. This approach is based on a constructivist pedagogy where students’ learning is centred on the creation of meaning by the students (Piaget 1977). Learning activities that emphasise cooperative and/or collaborative learning with interaction among peers facilitate this approach. The following are suggested means of integrating this into practice:

- problem-solving exercises which include influences on the environment, community or economy
- use of sustainability topics/principles/concepts to show the relevance of the subject matter
- use of sustainability case studies in material or as sources of information
- use of guest speakers
- use of audio visual material, websites and literature to develop critical thinking skills
- setting of assessment tasks around sustainability concepts.

The main focus of the curriculum renewal work within the two schools was on developing a holistic, integrated approach where students could achieve a deeper understanding of sustainability so that they could then use their learning to make informed decisions and choices in their personal and professional practice. Within this context, the project team suggested the following key sustainability concepts as a focus:

- the interdependence of major systems
Critical to the process was challenging educators to reflect on the concept of sustainability, reinforcing the educational potential of the field specifically within their courses. The approach taken to learning and teaching was to assist academics to develop courses that required students to critically reflect on their own values. Reflection on values helps to align behaviours of students with the knowledge they acquire through the formal educational experience. The approach taken to curriculum development was to encourage its links to disciplinary and industry examples, whether in the curriculum content or in the assessment. This would then provide students with a contextual framework which illustrated the relevance of the material presented. Furthermore, experiencing theory and its practical application legitimises course content and stimulates the learning process, which results in a greater depth of learning and retention of knowledge.

4.4.3 Sustainability praxis: how this approach translated into practice

The project team recognised that sustainability could be integrated into curricula in two main ways: through the development of modules inserted into existing courses or the development of new courses. The ideal outcome of the project was for sustainability principles and capabilities to be embedded across the entire curriculum of the academic schools so that students graduate with an understanding of sustainability as it relates to the discipline and individual practice. However, it was recognised that in some instances a first step would be to develop stand-alone sustainability courses, to ensure the material is present in the curricula. As momentum builds within the school a more integrated and holistic approach could be taken.

These concepts were first developed as part of the HE21 project by the Forum for the Future and can be found at <http://www.he21.org.uk/>.
Several stand-alone sustainability courses were developed within each school, which were developed to provide students with the theoretical understanding of the many practical ways to achieve sustainability within the context of their discipline. These courses were developed to demonstrate that the problems facing contemporary society and organisations are complex, and they require leaders with a capacity for critical thinking and entrepreneurial imagination (Chia 1996). Assessment tasks were designed to invite students to begin to think about how they might become change agents for sustainability, or to think critically about some of the assumptions they take for granted.

Some of the courses developed were ‘core’ to the degree to be undertaken by all students, while others could be chosen as part of the elective program that runs across RMIT University. All students must complete three electives from this program. This aim of the elective program is to allow students scope to study subjects that are outside the discipline curricula that may be of interest to them, allowing them to develop speciality skills. A total of 16 courses were developed or modified to include sustainability content (Tables 4.1, 4.2 & 4.3).
### Table 4.1: Courses selected for curriculum renewal as part of the BELP project from the School of Property Construction and Project Management\(^1,2\)

<table>
<thead>
<tr>
<th>First Year: Semester One</th>
<th>First Year: Semester Two</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUIL 1105 Construction Science (E)</td>
<td>BUIL 1149 Property Economics (E)</td>
</tr>
<tr>
<td>BUIL 1107 Design and Documentation (E)</td>
<td>BUIL 1114 Residential Design and Measurement (E)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Year: Semester One</th>
<th>Second Year: Semester Two</th>
</tr>
</thead>
<tbody>
<tr>
<td>OMGT 1124 Urban Economics (E)</td>
<td>BUSM 3130 Risk Management (E)</td>
</tr>
<tr>
<td></td>
<td>BUIL 1128 Building Services (E)</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Third Year: Semester One</th>
<th>Third Year: Semester Two</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUIL 1216 Human Relations &amp; Occupational Health &amp; Safety (E)</td>
<td>BUIL 1217 Research and Sustainability (N)</td>
</tr>
</tbody>
</table>

**Electives** (alternative delivery mode)

- BUIL 1161 Affordability and Sustainability Study Tour: Open to all year levels from across the university (N)
- BUIL 1135 Environmental Management/Sustainable Construction Off Shore Course (N)

**Notes:**

1 E: existing course revised; N: new courses developed as part of BELP
2 The courses shown are undertaken by all undergraduate students studying the following degrees within the School:

- Bachelor of Construction Management
- Bachelor of Project Management
- Bachelor Property Management
- Bachelor of Valuation.
Table 4.2: Undergraduate Courses selected for curriculum renewal as part of the BELP Project, School of Management

<table>
<thead>
<tr>
<th>First Year: Semester One</th>
<th>First Year: Semester Two</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUSM 3123 Organisational theory and Design (E)</td>
<td>BUSM 1094 Introduction to Organisational Behaviour (E)</td>
</tr>
</tbody>
</table>

Table 4.3: Postgraduate Courses involved in curriculum renewal, School of Management

<table>
<thead>
<tr>
<th>Electives (alternative delivery mode)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSUM 3889 Managing for Sustainability (N)</td>
</tr>
<tr>
<td>BUSM 1164 Leadership (Masters Degree in Business Leadership) (E)</td>
</tr>
</tbody>
</table>

Notes:
1 E: existing course revised; N: new courses developed as part of BELP
2 The courses listed in the table are undertaken by all undergraduate students studying the following degrees within the School of Management:
   - Bachelor of Business – Management
   - Bachelor of Business – International Business

4.44 Evaluation of student experiences

In order to understand the effectiveness of the approach to education for sustainability taken by the project, two courses within the School of Property Construction and Project Management were evaluated. The first course BUIL 1217 Research and Sustainability was a new third-year course developed to ensure that students’ understanding of research informs their ability to critically examine sustainability. The students are taught sustainability principles using different research methods so that they better understand the often-complicated decision making that surrounds sustainability issues. They also have the opportunity to visit innovative green building projects, undertake building audits, question experts in the field, and study their own impact on the environment using interactive web-based tools. Students carry out group-work research in an area of sustainability. In addition they are asked to complete an independent literature review on a topic relating to one or more aspects of sustainability, showing that they have grasped the key concepts and can apply critical thinking in their approach to developing a research question for their final year project (Hayles & Holdsworth 2005).
Students commented that the course helped them to understand sustainability concepts, raised the importance of environmental issues and assisted them in learning new approaches to building/construction and sustainability from both a personal and professional perspective.

Of the participants, 28 per cent strongly agreed and 40 per cent agreed that overall they were satisfied with the quality of the course, while 26 per cent did not know and 6 per cent disagreed. Students commented that the approach to curriculum required too much assumed knowledge, and that there needed to be a brief introduction to topics. Students felt the approaches to teaching and learning (guest speakers, group work, footprint activity and site visits) added to the learning experience, both assisting with the understanding of theory and practice, but also enabling them to problem solve. However, they found the logistics of the course difficult, citing that three-hour lectures were too long and class sizes were too large to maximise the learning process.7

Of the students, 14 per cent strongly agreed and 44 per cent agreed that the course contributed to their confidence in tackling unfamiliar problems, while 32 per cent did not know if it had and 5 per cent disagreed.

Of the students, 12 per cent strongly agreed and 36 per cent agreed that there was a good balance between theory and practice, while 42 per cent did not know and 10 per cent disagreed.

While 18 per cent of students strongly agreed and 52 per cent agreed that the assessment tasks in this course required them to demonstrate what they had learnt, 22 per cent did not know, and 6 per cent disagreed and 2 per cent strongly disagreed. Students stated that the style of assessment added to the assessment experience and visiting the sites they were required to undertake assignments on was beneficial.

Students generally approved of the style of assessment and stated that site visits were beneficial. Some students did not like working in groups.

7 Three-hour teaching sessions are standard within the school to allow students greater opportunities to take on part-time jobs. There were no opportunities to change this format.
While 34 per cent of students strongly agreed and 42 per cent agreed that they saw **how they would be able to use what they learnt in the course in their career**, 10 per cent did not know and 4 per cent disagreed. Students commented that there was a good link between content and application with real-world practice and that they understood the importance of the construction industry to their future. However, others commented that more site visits would have added to their understanding of the link between theory and practice and that more visits to commercial buildings would have been good.⁸

The second course, BUIL 1161 Affordability and Sustainability Study Tour, was also a new course – an elective open to all students within the university. Students attended seminars and site visits in both Melbourne and in Auckland, New Zealand, where they were given the opportunity to compare methods of eco-assessing domestic building designs. They also looked at key environmental issues and adaptive housing designs. Students were required to complete an assignment to demonstrate an understanding of sustainability and housing affordability issues as well as looking at current best practice in housing development. They were asked to produce housing plans for a specific location, taking into consideration issues that may affect sustainability performance and long-term affordability. Students were invited to present, in an open forum, the key challenges they experienced in planning for sustainability and to critically explore whether housing sustainability should be driven by the house builder or the consumer. It was hoped that this hands-on approach would mean that students are better equipped to tackle complex issues in their own professional practice (Hayles, Robson & Holdsworth 2006).

Of the participants, 22 per cent strongly agreed and 45 per cent agreed that overall they were satisfied with the quality of the course, while 22 per cent did not know and 11 per cent disagreed. Students commented that travelling overseas and living with their peers allowed them not only to learn from the course, but also from each other. The spare time allowed students to think and discuss with each other the concepts that had been presented to them throughout the day.

While 22 per cent of students strongly agreed and 28 per cent agreed that the course contributed to their confidence in tackling unfamiliar problems, 39 per cent did not

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⁸ The students spent two weeks (6 hours) on site visits to commercial buildings.
know and 1 per cent disagreed. Students agreed that the active learning element and the need for self-motivation and to take responsibility for their own learning enabled them to develop confidence in their own abilities, especially as it related to new information and approaches to assessment.

While 39 per cent of students strongly agreed and 33 per cent agreed that there was a good balance between theory and practice, 11 per cent did not know and 11 per cent disagreed.

While 48 per cent strongly agreed and 24 per cent agreed that they could see how they would be able to use what they learnt during the course in their careers, 16 per cent did not know and 12 per cent disagreed.

While 42 per cent strongly agreed and 24 per cent agreed that the assessment tasks in the course required them to demonstrate what they learnt, 17 per cent did not know and 17 per cent disagreed. Students commented that they were uncomfortable with being assigned to a group and having to rely on other group members; their main concerns were that the group-work mark may not have reflected their own work.9

Both courses focused on student-centred learning and this required the students to take responsibility for their own learning, as there was an expectation that students would become independent and self-motivated learners. The feedback on this learning style was mixed; students who did not see the value in the courses were not comfortable with the delivery style. Those students who did not enjoy the approach to learning and teaching embodied within BUIL 1217 Research and Sustainability stated that they were more comfortable with a traditional lecture style, where learning is assessed by written examination. However, discussions with the lecturers revealed that they believed that the traditional approach to assessment merely requires the learner to display the content that they could recite from memory, and fails to assess their ability to apply the content or developed knowledge.

The approach to sustainability educational pedagogy within the two courses required the students to critically reflect on their own values in order to align their behaviours with the

9 The students had not received a final mark for the course when completing the evaluation, and their concerns were unfounded, as the individual work they produced had the greatest influence on their final grade.
knowledge they acquired through the formal educational experience. Students were challenged to synthesise what they knew through informal learning with what they were formally provided with. This required students to explore unexamined concepts and assumptions that have evolved over their entire formal and informal educational experience. The resulting discussion, reflection and/or debates were often emotionally charged. While some students found this a rewarding experience, others found it difficult. Some students did not see the value in exploring the concept of sustainability, some were ideologically opposed to the concept and others were frightened to confront their preconceptions and explore other possibilities. Students were unfamiliar with this approach to learning and were often initially opposed to education of this nature. However, students generally contributed in class and, despite experiencing discomfort, still felt that they had truly learnt something from the experience. Additionally, linking curriculum to disciplinary and industry examples, whether in the curriculum content or in the assessment, provides students with a contextual framework which illustrates the relevance of the material presented. Experiencing theory and its practical application legitimises course content and stimulates the learning process, which results in a greater depth of learning and retention of knowledge.

From discussions and work with the lecturers involved in the BELP project, it was observed that a considerable amount of time is required to design and prepare for such interactive learning environments, which is one of the biggest barriers to changing curriculum content and approaches to delivery. The preparation and delivery of the two courses was both time consuming and at times emotionally and physically exhausting. Approaching learning and teaching from this perspective requires lecturers to move out of their own comfort zones and rethink their conceptions of teaching and learning. This approach places educators in the position of learner as well. It requires them to think through the moral purpose associated with their curriculum, not just its role in maintaining current professional practice. This approach to teaching and learning requires that educators recognise there are wider consequences of knowledge acquired within the classroom which affect the learner’s actions within society (Carr 2005). Given these challenges, the level of support provided in projects like BELP may well be necessary to achieve genuine curriculum change for sustainability.
4.5 Academic development

The BELP project approach was founded on the assumption that academic development is a key mechanism for achieving curriculum and institutional change for sustainability (Holdsworth et al. 2006a). Hargreaves (1997) argues that embedding and scaling up innovation is more a matter of re-culturing educational practice than merely restructuring curricula. The approach adopted in the BELP project is one in which the ‘cultures of teaching’ in different university schools are the ‘prime focus for educational change’ (Hargreaves 1997, p. 1). The success of this project hinged on an appreciation of the context in which the work took place and the way in which the project was supported by key stakeholder groups within the university.

4.5.1 Action learning approach

The BELP project followed an action learning approach with four stages:

1 Sustainability course audit

To ensure that staff within the School of Management and the School of Property Construction and Project Management were adequately supported, an academic champion was engaged (and given part teaching release) for one year to work as part of the BELP project team. The role of the academic champion was to coordinate activities within the school, using the opportunity for academic staff to precipitate change.

The champions in the School of Management and the School of Property Construction and Project Management conducted audits to identify courses containing material focusing on sustainability. The audit also helped to identify opportunities for and barriers to including sustainability in the curriculum, and assessed the attitudes of staff towards sustainability education. The audit also engaged staff members individually to raise awareness and interest in sustainability (Holdsworth, Bekessy & Thomas 2009).

2 Action learning workshops
Workshops were held in each school to develop a broad understanding of the place of sustainability in the school’s programs and courses, and to develop approaches and strategies for implementing curriculum change. The workshops were run to engage academics in the topic of sustainability and to encourage the incorporation of sustainability concepts into existing content, or the development of new courses where relevant. The sessions were structured to provide academics with the opportunity to think about how they define sustainability in both their personal and professional practice and to explore how concepts of sustainability sit best within their subject material (Holdsworth, Bekessy & Thomas 2009).

3 Development of a web resource

A web resource was developed to assist with the incorporation of sustainability content into courses. The website had three objectives:

- to present information, tools and examples to assist the conceptualisation of sustainability education and to support curriculum development
- to present findings of the BELP project including activities, approaches, courses and lesson plans
- to act as a communication platform to provoke discussion and reflection (Holdsworth et al. 2006a).

4 Action learning groups

In action learning, the most valuable learning occurs when action is taken, for one is never sure the idea or plan will be effective until it has been implemented (Pedler 1997). To follow on from the activity generated by the workshops, an informal group was established in each school to expand the range of courses targeted for revision. The role of the action learning groups was to review generic and school-specific findings from the course audits with the aim of enhancing the adoption and integration of sustainability themes into the school’s programs and courses. The group work was facilitated by the academic champions from each school and assisted by the BELP project co-ordinator (Holdsworth et al. 2006b).
It was recognised that the success of this project hinged on an appreciation of the context in which the work took place. This required an understanding of the approach to educational praxis – pedagogy, learning and teaching, and curriculum development – within the different schools and an appreciation of how sustainability is understood and implemented by professional industry bodies, organisations and potential employer groups. The academic champion provided valuable insights into the culture of the schools and an understanding of the discipline area, assisting in the identification of areas in which sustainability content could be embedded using appropriate change processes. As valued and respected members of the school they ensured that the project was based on collaboration and shared understanding.

The role of the champion was to incorporate sustainability concepts into one of their existing subjects, to coordinate education for sustainability activities within their school and to provide peer support (education, advice, resources) to other academics in the school. The use of champions ensured that the project methodology was tailored to the relevant discipline area, recognising that academic staff are sceptical about change directed by those outside their discipline area (Alabaster & Blair 1996).

To overcome time constraints, which is cited as a major obstacle in actioning organisational change and curriculum renewal (Dawe, Jucker & Martin 2005), part of the project budget was used to buy out the academic champions from some of their allocated work. Previous curriculum renewal projects conducted at RMIT have been unsuccessful at facilitating lasting curriculum change (Findlay & Thomas 2000). While those involved in the RMIT studies in the past have expressed strong interest in sustainability education, other impediments have dissuaded them from developing this focus in their teaching. Thomas (2004) suggested that difficulties may have arisen from the financial difficulties of developing cross-departmental (usually cross-disciplinary) initiatives.

In addition to the subjects developed within each school, an additional key outcome of the BELP project was the development of a flexible framework for curriculum change that other universities could draw upon. The framework was developed from the experiences of the project and can be used in totality, or sections can be used
independently. In either case it is crucial that the framework fits within the culture of the organisation engaged in change. The framework is presented in Appendix F.

4.5.2 Evaluation of the BELP approach to academic development

Interviews with the project team identified that despite some isolated innovation, the BELP project did not substantially change approaches to sustainability education across the two schools. One interviewee commented that ‘much of what is taught has been taught for years’. Improvements in learning and teaching within universities can be very difficult to achieve, especially in light of emerging funding structures, which have seen the increasing decoupling of research and teaching (Holdsworth, Bekessy & Thomas 2009). Consequently, learning and teaching is not seen as a priority area, and academic staff spend little time reflecting on and improving their praxis/practice.

One of the project team identified that an unexpected outcome within one of the schools was the interest generated in improving learning and teaching practice:

Staff within this school began to recognise and value ‘what and how’ we teach.

Consequently, learning and teaching is being taken more seriously with the development of committees and awards to further research in the area. Another unexpected outcome of the BELP project was the link between teaching and research. The perception emerged that research on sustainability and disciplinary practice needed to be embedded into curriculum if it was to remain current with contemporary and future practice. The reasons cited for this shift in thinking included the leadership shown by the academic champion and the relevance of sustainability in current professional practice and policy development. The role of the academic champion was integral to this process, and their understanding of the relevance of sustainability principles in profession practice informed their approach to change within the school and among their colleagues. This understanding was gained through dialogue with individual staff members, and the outcomes of the sustainability course audit and workshops. One interviewee commented that:
The academic champion was a vital part of the project methodology as they provided leadership to other staff members from a disciplinary perspective; they were able to lead from within.

Another outcome of the project was the new area of work undertaken by one of the academic champions; this consisted of the development of new and innovative curricula, the successful application of funded research in the area of sustainability and teaching, publication both nationally and internationally on sustainability education, and the development of trans-disciplinary research projects. This was very inspiring for other staff members within the school, and highlighted the opportunities and possibilities for other academics. This is reflected in the following statement by one of the project team members:

*It was important for the project team to draw on other areas of recognition and validation for the research, such as academic papers, other research grants and links with industry. This helped to increase interest and commitment to the idea of curriculum change and sustainability.*

The BELP approach to academic development was to assist academics to develop their own understanding of sustainability. The workshops were designed to give academics an opportunity to explore the principles of sustainability and the relationship to their own values, before positioning sustainability in their course materials. While the project effectively engaged academics, it did not result in academics taking ownership of their own learning. This was reflected in the following statement by one of the project team:

*There was limited interest from academics within the school, making it very hard to engage initially. As time went on and with the support of a new Head of School, other academics attended a workshop and paid lip service to the project, but they were not prepared to spend the time to identify changes that could be made within their courses unless these changes required minimum effort on their behalf.*

Jucker (2002a) argues that our understanding of sustainable development is predetermined by our social values, personal privilege and power politics. He further argues that this understanding is shaped by the assumptions and methodological issues
associated with the disciplines we work within, at an epistemological, ethical and ontological level. The BELP project provided an opportunity for staff to explore sustainability from a personal perspective and to identify how it might relate to their course content. However, it did not provide enough opportunity, support and guidance to enable individuals to revisit and revise the values, assumptions and understandings that predetermine our understanding and resultant behaviours (Jucker 2002a). Only through a deeper level of engagement can a deeper understanding of sustainability be achieved and in turn become embedded into practice (Fisher 2002; Scott 2002). One of the project team commented that:

_A clear need was identified for staff training in sustainability; many staff members had a shallow understanding of the issues and found it difficult to understand the relevance of sustainability to their discipline beyond a superficial treatment._

Despite the project approach and structure, long-term change did not result. It was apparent from the case study data that because of differences in the relationship between the champion and the head of school and other staff in the two participating schools, the style of engagement of the two schools was substantially different. This resulted in a different level of engagement and short-term success in terms of subject revision and practice (courses taught), and the project aims were more successfully achieved in one school. This outcome may have been different if a more prescriptive approach to change within the schools had been taken, but this would have been difficult to achieve and contradictory to the very essence of the project approach. To ensure the success of curriculum change programs, sensitivity to the needs of particular disciplines is essential. This requires flexibility and freedom within the change team that cannot be directed or determined from the outset by those providing advice. One-on-one interaction with staff members was an important step to achieving buy-in, but this is very time consuming and not always successful.

The lack of ongoing change as a result of the BELP project was also linked to its twelve-month time frame. It was recognised by those involved that this was not adequate to have any real long-term impact within either of the schools, nor was one champion within each school adequate to develop the capacity required to create the level of
Case study 1

A small group of change agents rather than an individual would have been more influential; another year of the project may have strengthened the team around the academic champion. This is especially important to consider when dealing with a culture that is heavily resistant to change.

4.6 Organisational change in universities for sustainability education

Alabaster and Blair (1996) argue that curriculum change projects that are generated from outside the area of change often face resistance. In order to address this issue, the BELP project specifically focused on working within the disciplines of the two schools involved aided by the academic champions from within each school. Rather than seeking change through a centrally mandated, whole-of-institution policy, the BELP project recognised that educational change occurs through cultural changes. This approach was based on the assumption that shifts in culture occur through the way academics work with their disciplinary expertise, interact across interdisciplinary boundaries, and negotiate the forms, purposes and pedagogies through which knowledge and learning experiences are prepared for, and experienced by, students (Holdsworth et al. 2006c).

Organisational change within institutions requires guidance and support from the top (upper-level management support) (Bekessy et al. 2003). Therefore, it was considered important to the success of the BELP project to have management support, and the selection of the two schools was based on the supportiveness of the heads of school and on their understanding, sympathy and attempts at integrating concepts of sustainability issues into their curriculum.

Additionally, Thomas (2004) suggests that curriculum change with a sustainability focus requires a ‘bottom-up’ approach; to achieve a ‘groundswell’, other staff would have to appreciate the relevance of sustainability to their work. The project team were able to support those working within the schools as they had extensive experience in the provision of sustainability training courses and programs, and had conducted a range of relevant research programs and other projects.
The BELP project was structured to overcome the barriers to organisational renewal in tertiary organisations identified by Cowell, Hogson & Clift (1998) as:

- a lack of a culture of value or priority given to sustainability
- a lack of organisational and resource support for staff
- a lack of training for academic staff.

The project identified two additional major factors controlling the structure and functioning of academia – disciplinary structure and economic forces. To overcome time constraints and economic barriers, part of the project budget was used to buy out the academic champions from their daily activities. To overcome the disciplinary structure barriers, high-level management support from the heads of schools was secured, ensuring that staff appreciated that the project was an important priority for the school. Both heads of school were new to the university and this allowed them to engender a focus on innovation and change. However it also restricted their ability to work on the project, as they were limited in the time they could commit. Both saw their role in the project as providing organisational support and leadership and mentoring the champion in order to effect change within the school. Their leadership and support encouraged the champions to expand their positions, formulating their research and teaching to have a sustainability focus.

The findings of this case study suggest that the role of the champions as primary change agents was crucial to the project’s achieving its goals. The ability of the champions to encourage change was determined by their ability to present their case convincingly to staff. For long-term change to occur it is important to build relationships across the school and create a sense of community and a sense of validation. It was identified from the interviews that for this to occur successfully the champion needed to be a valued and respected member of the school who was able to collaborate and share knowledge effectively. Factors that determined this include: presence, academic status, tenure, ability to influence other staff and leadership style. Support from the rest of the project team – especially the project coordinator – was also important to the success of the champion, as was the allocation of time to allow them to work on this project. The
ability of the champions to develop (or not) a community of change was reflected in the initial and intermediate outcomes of the project.

Within both schools, sustainability skills were embedded into some position descriptions, and some of the newer appointments have experience in teaching and research in sustainability. As a result of the project there is now momentum in the university, and more people are thinking and talking about sustainability education. Since the completion of the project both champions have left the participating schools, and this has resulted in a loss of momentum in curriculum development. This is primarily attributed to the perception that there is no one in either school who can provide knowledge and support on sustainability issues. The champions have not yet been replaced, as individuals with the appropriate knowledge and skills have been difficult to identify. While the curriculum in one school, developed and taught by the academic champion, has continued to be taught over the past year and half, permanent teaching staff have been difficult to find, and the long-term viability of these courses is questionable. Courses developed in the second school have not run because of a lack of student interest, and the lack of staff members to champion these courses.

The findings of this case study show that there is a clear link between curriculum change and organisational change, and the lessons learnt from research into organisational change in universities must be taken into consideration when thinking about academic development. Achieving change in teaching practice and the curriculum will require an understanding of the change process – specifically internal influences for change (including beliefs and concepts of teaching) and external influences for change (workplace dimensions and culture). Chappell (2007) argues that if we want to improve teaching (content and practice), we must recognise and deal with both its systemic and its cultural aspects. Chappell argues that cultural activities are highly stable over time and not easily changed. Cultural activities are systems, and systems, especially complex ones such as teaching, can be very difficult to change. As commented by one interviewee:

*We were asking participants to question the foundations of their discipline, and there is clearly some tension in the very nature of some programs and*
sustainability. The value of sustainability education as an ‘add-on’ to an otherwise conflicting program is questionable.

Without an understanding of the change process, academic development programs are unlikely to create lasting change in teaching and learning for sustainable development. Despite its theoretically ideal methodology, BELP failed to achieve its potential in the long term because it was not directly defined as a ‘change project’, or the project did not get as far as the ‘change’ component. By accepting all academic participants on their own terms, and not challenging them to move out of their own comfort zones, the status quo was maintained by the majority and the need for change recognised by only a few.

4.7 Conclusions

BELP led to the modification or development of 16 courses in two contrasting discipline areas to provide a sustainability focus. Other unexpected and unforeseen ideas and skills were also achieved, including leadership, sustainability as a focus for reconnecting teaching and research and an increased profile of sustainability education within the university. Several unique aspects of the project contributed to its success. Firstly, a highly collaborative, interdisciplinary project team was established, with full support from three heads of school. Secondly, a champion was appointed in the participating schools to facilitate the discussion about sustainability education and to assist other academics to change their curriculum. A critical aspect of their appointment was the buying out of some of their time, so that they could be involved in the project without the burden of its being ‘on top of’ their other work. Thirdly, a key element of the BELP project was the recognition that the program goal, that is curriculum revision, needed to fit within the culture of the organisation undergoing change. This also meant that the project needed to be owned and driven by the participants, and this was especially important when considering education for sustainability. The program recognised the inherently contested nature of sustainable development and believed that it could only be truly understood and seen as relevant if it was placed within a specific context – in this instance the curriculum of the specific discipline and program.

The experiences of the BELP project indicate that for any sustainability education curriculum development project to be successful in the long term, there needs to be a
dynamic approach to change management – one that recognises the importance of the culture of the organisation in assisting or blocking the proposed change. There is a need for training that allows individuals within an organisation to develop greater understanding of sustainability, including their personal and disciplinary assumptions and resulting practice. Support from authoritative figures in the university – including academic leaders and department heads – and high-level university policy is essential. Engagement with academic staff needs to be on their level, and change agents are essential to this for both leadership and encouragement. However, it is important to consider their ability to develop, facilitate and empower a community, which is willing and able to embrace change.
5 Case study 2: Youth Encounter on Sustainability and Educators Seminar on Teaching Sustainability, ETHsustainability, Zurich

5.1 Introduction

The Youth Encounter on Sustainability (YES) is a sustainable development education program initiated in 2000 by the Alliance for Global Sustainability (AGS) and run by ETH Sustainability.\textsuperscript{10} The YES program is a two-week intensive course initially held in Switzerland involving 40 participants from approximately 25 different countries.\textsuperscript{11} The aim of the YES program is to sensitise Masters and PhD students from different disciplines and cultures to the concepts and complexities of sustainable development in a unique way, so that the emotion, social, moral and ethical components of the debate are integrated into the more technical and scientific knowledge base (Baud 2004). The program provides participants with a basic toolkit so they are able to make decisions and take actions with fundamental understandings of what sustainable development is, and integrate that into their decision-making processes (ETHsustainability 2005c). A key learning objective is for students to plan their own vision of a sustainable world and to explore their role as emerging leaders.

From the experience of the YES program, ETHsustainability recognised that sustainability education calls for a new vision in college and university curricula – a vision of learning that builds understanding of the critical economic and social

\textsuperscript{10} In 2009 the new board at ETH Zurich ended its financial commitment to the YES courses. This coincided with the retirement of the main creator and driver of the YES course. ETH Zurich still supports the course concept, but YES and the associated activities have been taken out of the organisation into a special company that has the status of an ‘ETH spin-off’ company: ACTIS (Activating Talent in Sustainability). This organisation has been created with colleagues from ETH Zurich who continue to be involved and support the courses. The task of the new company is to identify and obtain funding to support future YES courses.

\textsuperscript{11} To date, a total of 12 international YES courses have been held in Braunwald, Switzerland; one in Tokyo, Japan; one Latin American regional course in Costa Rica; one Central and Eastern European regional course in Slovakia. A total of 700 students from 85 different countries have been trained in these courses and they form the active YES Alumni Network. In 2004 ETHsustainability, the Center for Sustainability at the Swiss Federal Institute of Technology (ETH), Zurich, was given leadership for running the course, though collaboration with the AGS partner schools to deliver the program continues (Grant 2009). By March 2009 there had been 26 courses all around the world, and there were over 1000 committed YES alumni in 110 countries and from all types of academic disciplines.
challenges of the 21st century and their linkages. In response, in 2005 ETHsustainability developed the Educators Seminar on Teaching Sustainability (ESTS). The program recognises that students from all walks of life preparing for careers must be equipped with the knowledge and skills they need to meet the challenge of sustainable development – no matter where their professional lives lead (ETHsustainability 2005b).

The ESTS Program is a one-week intensive short course for professors, researchers and lecturers at college and university level, regardless of their discipline or geographic region. A broad range of disciplines is sought to encourage the multi-disciplinary approach and to facilitate cross-disciplinary dialogue. The learning seminar is designed to help college and university lecturers incorporate the principles of sustainability pedagogy into their coursework with clearly defined concepts and content, instructional tools and methodologies for assessment and evaluation of learning.

The ESTS program has the same basic aims as the YES program, but also includes these additional aims:

- to enhance understanding and integration within higher education programs of the principles of education for sustainability across geographic and disciplinary boundaries
- to share effective teaching tools for sustainability education
- to promote awareness of cutting-edge research on global sustainability issues
- to provide participants with teaching tools and the means to evaluate curricula in their field against sustainability education criteria
- to deliver a transferable model for an intensive international program on sustainability designed for students in higher education (Grant 2009).

This case study examines the content framework, pedagogical approaches and learning objectives that form the foundation of the YES and ESTS programs run by ETHsustainability. The findings contained in this case study will be structured to reflect the SEAD framework for best practice developed in the literature review. Consequently,
the case study will explore how the YES and ESTS programs define, interpret and apply the key components of the SEAD framework, which include:

- an ability for all involved to understand and reflect on their own construction of knowledge and worldview
- how sustainability was defined and understood as it related to education
- approaches to academic development
- organisational change to support sustainability education in higher education.

While this thesis specifically focuses on academic development, it is imperative in this case study to also describe and evaluate both the student program (YES) as well as the academic program (ESTS). This is crucial to understanding the ESTS program, as it has been developed from the structure, approach, content and experiences of the YES program.

### 5.2 YES and ESTS case study methodology

The evaluation of the YES and ESTS programs was guided by an interpretivist paradigm and uses both qualitative and quantitative research methods. Assessment of the programs structure, methodology and content was undertaken using qualitative research methods, specifically semi-structured interviews with four core faculty members, who were selected to be interviewed based on their current role within the program (program leader, coordinator and faculty/teaching staff), which included program delivery, course coordination, and initial and ongoing development of the program’s structure and content from 2000 until 2006. The findings from the interviews were then triangulated against the findings from documentary research to ascertain if the stated program structure methodology and content was consistent. The questions used in the semi-structured interviews are located in Appendix A; the list of documents used in the documentary research is presented in Appendix C; and a summary of the semi-structured interviews is presented in Appendix G.

Attitudinal surveys were undertaken with current and past participants of both programs to determine if the program structure and goals were successfully implemented. The
survey questions are presented in Appendix 2. Three surveys were conducted; one was conducted with the participants of the 2005 ESTS program (see Appendix H for results), and two surveys with the following YES participants:

- the graduating cohort of the August 2006 program (see Appendix I)
- the remaining alumni from 12 YES program that ran from 2000 to July 2006 (see Appendix J).

Surveying the YES graduating cohort in August 2006 allowed for the comparison and assessment of the learning outcomes of those recently completing the program with the findings from faculty interviews and documentary research. The alumni survey allowed for an assessment of the long-term outcomes of the program, in terms of creating personal and professional change for sustainability. The evaluation and assessment of the ESTS program provided an understanding of the success of modifying the YES program for academic development in sustainability.

The YES and ESTS programs evaluation survey constituted a combination of both open and closed questions discussed in chapter 3. The total scores for each survey were then taken to indicate the respondents’ positions regarding the attitude. To ensure that respondents were not forced into providing answers they were not comfortable with, room to provide comments or clarification was included. The survey was placed on a secure website and the link was emailed to participants. The list of participants was provided by ETHsustainability. The August 2006 YES course had a response rate of 100 per cent, the alumni survey had a response rate of 14 per cent, and the ESTS survey response rate was 25 per cent.

5.3 Findings

A complete set of responses from interviews, documentary analysis and surveys is provided in appendices C, G–J. The discussion below presents key findings from the ETHsustainability education programs, using descriptive narrative and statistical analysis of participants’ experiences.
5.4 **Approaches to sustainability education**

ETHsustainability believes that education and raising awareness are the most effective ways to foster the ethical and moral values to guide behaviour to align better with the ideals of sustainability. However, they recognise that there is no set strategy or proven formula for achieving this goal, and it remains the most challenging component of ESD theory to implement. The ETHsustainability education programs seek to be an experimental platform for concepts of social learning that attempt to address this aspect of ESD. The content and pedagogy of their programs are kept open and flexible and tailored to the specific needs of different target groups.

Both education programs chose not to provide a definition of sustainable development to participants, encouraging them to determine meaning for themselves, within their own personal and professional contexts. This is reflected in the responses of the faculty members when asked how they defined sustainable development. All interviewees referred to the standard definitions of sustainable development (the Brundtland 1987 definition); however, they abstained from referring to sustainable development as a definition, but preferred to see it as a concept. As stated by one faculty member, ‘Definitions inhibit implementation of anything practical’. The faculty interviewees were happy, and able, to identify key elements that form the foundations of sustainable development, which included:

*Improving quality of life for all living things on the planet by improving the interaction between the human with the natural environment, and interaction between natural and social systems.*

and

*Understanding of how:*

1. *our actions now can impact the future (understand the impacts of our actions)*

2. *the sum of small collective actions can add up to a fairly potent force for better or for worse so society/individuals need to understand that the net sum of society’s decisions can be quite significant.*
The same approach was taken by faculty members in responding to the question of how they defined sustainability education. No single definition was given, just key elements identified as forming the foundations of sustainability education from the core faculty. Their comments included:

*Education that is more holistic for me – this is firstly making sure that every human has a basic grounding in fundamental natural and social systems on the planet so instead of being very mono-disciplinary – how we more and more are being forced to become these days – it is about making sure that everybody has this basic knowledge and an understanding of the complexities and interconnections of absolutely everything. Of course it is important to have experts within [the] field, but having a holistic concept that needs to be worked on first. The second fundamental concept for education for sustainable development is the nurturing of the development of core skills that allow you to put your knowledge into practice to effect positive change. This is to do with leadership skills, the development of moral and ethical values set.*

*Educate for a shift in mindset so that people realise that any action of any size that they take [has] … the potential to impact the future to affect the future and that if we can move society collectively to understanding the difference between positive and negative impacts then we have the opportunity to really have an impact on the future.*

The faculty members all believed that sustainability education required educators to have an understanding of sustainability content and specific skills to teach such content. This is reflected in the following comments provided by the ESTS participants:

*I think that anyone from any discipline can teach, can understand, and discuss how their field or discipline plays a role in this sustainable development topic, but I think they need to integrate a mindset of impacts and actions with a future-looking mindset.*

*Not just anyone can teach sustainable development. I think there is definitely a very big knowledge base that educators need to have. You need to have*
been through the process that develops this knowledge base; you can have a field of expertise, but you must have a base knowledge in fundamental natural and social systems. So when I talk social system I mean political economic systems, systems that are really driving our societies and how they function and then of course natural systems.

Having an open mind despite having been educated in a mono-disciplinary way of thinking, having an awareness of the world and the key challenges faced, it is also about teaching didactical approach. They need to be much more open and allow a much more participatory environment, where they allow much more the opportunity for students to question, to debate, to learn from discussing from one another, and not just being the sage on the stage, where they are just basically producing the knowledge and the students are consuming it. I think that is a fundamental relationship that needs to change.

5.4.1 Sustainability education praxis: pedagogy, learning and teaching, and curriculum development

YES program

The education for sustainable development (ESD) model developed and taught within the YES program is founded on students' developing basic knowledge of the natural sciences and technology, and an understanding of economic, political, social and cultural structures. This is coupled with the exploration of ethical and moral frameworks and the nurturing of core skills to develop the capacity of participants to successfully devise solutions to global problems. The learning process is grounded in concepts of social and experiential education, putting ESD theory into practice. The YES model of sustainability education is founded on three fundamental elements, as illustrated in Figure 5.1.

The model addresses the need to establish a cross-disciplinary knowledge base about our society and the environment. This ‘includes an understanding of the natural sciences, technology, politics, economics, social sciences and the humanities, organised around sustainability concepts and issues’ (McKeown & Hopkins 2002). Core practical ESD skills are nurtured, such as the ability to:
• think critically and systemically
• communicate effectively across disciplinary and cultural boundaries
• cooperate and work in partnership with others
• move from awareness and knowledge to action

**Figure 5.1:** ESD model applied in the YES program (Grant 2009, p. 331)

- **1. KNOWLEDGE**
  - Cross-disciplinary understanding of society and the environment

- **2. CORE SKILLS**
  - Future visioning
  - Critical thinking
  - Participation
  - Collaboration
  - Systems thinking
  - Transferring knowledge and awareness to action
  - Consider different perspectives

- **3. VALUES**
  - An ethical / moral framework which reorients societies and individuals towards sustainable lifestyles

**ADDRESS GLOBAL CHALLENGES AND REALITIES**

• vision and plan for the future
• participate actively in decision making and planning processes (McKeown & Hopkins 2002)
• consider issues from the viewpoint of different stakeholders (McKeown 2002).

The YES course is set up under the umbrella theme of ‘Living for 10 billion people by 2050’ and is structured in four modules:
1 **Introduction to the concept of sustainable development** – explores and develops the participants' basic understanding of the theme including the goals, the complexities and the inter-linkages.

2 **Basic systems** – provides an overview of human (social, political and economic) systems and natural systems (earth and climate systems and biodiversity).

3 **Human systems: physical needs** – focuses on three issues of fundamental importance to human existence: energy and materials; nutrition and health; and living space

4 **Human systems: psycho-social needs** – explores human behaviour, psychology and sociology: our attitudes, consumption patterns, ethical and moral values and potential for change (ETHsustainability 2004; Grant 2009).

The program has been designed so that the four modules are complementary, strongly interlinked, and clear connections are made between each. These modules are based on the framework shown in Figure 5.2.

**Figure 5.2:** YES program content framework (Grant 2009, p. 332)

### Basic YES Framework

#### Sustainable Development: an Ecological-Social Concept

<table>
<thead>
<tr>
<th>Natural Systems</th>
<th>Human Systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Climate</td>
<td>Social, Political &amp; Economic Systems</td>
</tr>
<tr>
<td>Earth Systems</td>
<td>Psycho-Social Needs: Behaviour and</td>
</tr>
<tr>
<td>Biodiversity</td>
<td>Consumption, Education, Social Relationships</td>
</tr>
</tbody>
</table>

#### Physical Needs

- Energy and Materials
- Nutrition and Health
- Living Space

**Social-Institutional Drivers**

- Economy Sector
- Civil Society
- National and International Governmental Institutions

**Living for 10 Billion people**
The pedagogical approach of the YES program is based on a problem-based model to enable students to develop skills to work towards developing a more sustainable future. Consequently, within each module, ‘participants develop a basic understanding of the key concepts, examine the potential goals relating to sustainable development at a local, regional and international level, and think about possible solutions to reach these goals’ (Grant 2009, p. 332). Key to achieving this goal is the recognition that social drivers play a pivotal role in the development of solutions, and consequently three core ‘social-institutional drivers’ – the economic and private sector, civil society, and local, national and international governance are identified as cross-cutting themes for each module (ETHsustainability 2005c; Grant 2009).

The learning and teaching approach used and the ethical implications described by faculty members were consistent with the approaches described in their documentation. The core faculty members believed that ethics are a fundamental part of any form of education. However, it is particularly important when considering sustainability development education, as the goal is to try to encourage individuals to rethink values to achieve a paradigm shift. They believed that education plays a fundamental role in developing ethical and moral values within society. One of the core faculty members commented that:

"Our action and decisions are founded on our fundamental value set, and our understanding of what our basic needs are, morally what we consider right and wrong, and this is ingrained in cultural factors and is highly complex."

Both the YES and the ESTS programs attempt to address ethics and values from a multicultural and multidisciplinary perspective by asking participants to question and explore what value sets people from different parts of the world have, and how these are culturally shaped, and how we can address these issues while keeping these cultural sensitivities in mind. While ethics and values are inherently important to both programs, it was commented by one faculty member that ethics and values are present as curriculum content, but not given enough time to be fully explored:
We did more talking about the role of ethics and values in spirituality and morality. More talking about concepts rather than how we can change pedagogy so students have more time to think about these issues.

ESTS program

The aim of the ESTS program is to enable participants to examine and explore economic, social and technical complexities in meeting the sustainability challenge. The week-long interactive structure of the seminar encourages participants to share their diverse cultural and disciplinary experiences in incorporating sustainability principles and issues in their own teaching. Discussions in plenary and small working groups help the group to explore and develop content that promotes critical thinking. Participants also explore with experts how sustainability education can meet their university standards, and how to identify opportunities within their institutions to develop and promote teaching strategies related to sustainability education. The faculty members share experiences in establishing the YES program, which may provide a model for others who wish to expand and develop their own sustainability education programs.

The ESTS program has been developed from the YES model (see Figure 5.3). This approach to sustainability education praxis is founded on (a) the development of a certain type of skills base and (b) an understanding of some basic social, environmental and economic principles and systems for curriculum content.
The ESTS program argues that the most challenging and important aspect of ESD is the need to foster a moral and ethical set of values to reorient individuals and societies towards more sustainable lifestyles. Although closely tied to culturally specific traditions, beliefs and social normative systems, the program identifies a number of important values that are relevant to sustainability throughout the global community. These include a respect for human rights and the natural environment, democracy, peace and non-violence, equity (both intra- and inter-generational), biological and cultural diversity, and social and economic justice. The participants of the ESTS program generally agreed with the inclusion of ethics with 75 per cent of participants *strongly agreeing* and 25 per cent *agreeing* that ethics should be a part of education for sustainable development. One participant commented that ‘ethics is the underpinning of sustainability, but this is difficult to teach’.

The overall structure of the curriculum content of the seminar is set out below.

_Sustainability background knowledge_

1. The concept of sustainability
Introduction to the concept and understanding of sustainability in view of education

2 Introduction to education for sustainable development

(a) Discussion of ethics and values and how they inform our thinking processes

(b) Discussion of how education is the principal way to create the fundamental shift that we need to achieve sustainability

(c) Introduction to the importance of education for sustainable development and what it should achieve (ETHsustainability 2005b).

Role of education – education for sustainable development (ESD)

1 Discussion of key components of ESD including its importance, that it should foster cross-disciplinary basic knowledge and develop the core skills

2 Focus on higher education and the challenges for universities today, including a focus on the change process in three areas:

(a) Structure of the university

(b) Teaching methods and integration of ESD

(c) Experiential intensive learning courses

   (i) Stand-alone subjects/courses on sustainable development

   (ii) Integration into curriculum (ETHsustainability 2005b)

Basics in didactical methods at universities

1 Introduction to didactics

2 Learning theory and pedagogy

3 Learning cycles.

4 Pedagogy for ESD: (ETHsustainability 2005b).
Practical training in application of theory / presentation of cases (main focus of the course)

Integrated approach, Agenda 21 and Local Agenda 21 as tool for ESD, implementation, research as field of ESD, and practical ESD material for use in learning and teaching ESD (ETHsustainability 2005b).

YES & ESTS programs

The approach to sustainability educational praxis within both YES and ESTS programs recognises the need for innovative didactical pedagogical methodologies to be embedded into learning and teaching practice. Consequently, the program is structured and taught on the assumption that behavioural change can be achieved only when the learning process involves both cognitive and emotional elements (Grant 2009). The program engages participants in new ways of seeing, thinking, learning and working by making connections to real-life situations through experiential learning. Consequently, participants explore the relationships between individuals, the environment, social systems and institutions, and they foster skills and values necessary to become active participants and decision makers in the change process (Tilbury 2004).

These constructivist learning and teaching methods engage participants in a ‘holistic approach involving both cognitive and emotional learning processes that encourage creativity and new styles of problem solving’ (Grant 2009, p. 333). The learning process includes lectures, student presentations, small group and plenary discussions with interdisciplinary and international faculty members, discussion with invited experts, cultural events, and field trips, artistic and creative activities with a professional artist, and small-group case study and project work. A selection of these is described in more detail below.

Project-based learning and trans-disciplinary case studies

A learner-centred pedagogical approach is taken based on contextual learning around real-world problems which teaches students lifelong learning skills, such as problem solving, application of content to real-world situations, teamwork, communication, self-directed learning, cooperation, and cross-disciplinary understanding (Lipson 2006). Within different modules of the course, students are required to work in small
multicultural and multidisciplinary groups to address challenging, real-world problems, for which there is no single or simple solution. Participants investigate the problem and formulate a solution that crosses disciplinary boundaries; they take on roles different from their traditional ones: ‘The instructors facilitate, and students are encouraged and given tools to become self-directed learners’ (Grant 2009, p. 333).

Adequate time for reflection and processing new information and experiences

One important means for providing adequate time for reflection is the involvement of a professional artist who joins the group for the duration of the course. The artist works with students in the plenary and in small groups to encourage creative expression of concepts and visions. This encourages reflection, and students are guided in painting and drawing activities to reflect on their cognitive and emotional growth and transformation during the program. In 2007 a professional psychotherapist joined the program to conduct activities such as psychodrama with the group. The purpose of this was to improve social interaction in the group, develop communication skills, and to improve participants’ ability to communicate, express themselves and realise their individual potential. These are important leadership skills, which will enable the individual participants to be agents of positive change in their future careers.

Consideration of discourse and interaction across language barriers and subject areas

This activity is critical for individuals to understand sustainability content in a trans-disciplinary, historical and inter-cultural context. The sensitisation of students to the complexity and interactions within and between natural and social systems is as, or more, important than the teaching of mono-disciplinary knowledge (Grant 2009).

5.4.2 Evaluation of learning and teaching: YES program

The learning and teaching approach to sustainability education was positively reflected in the survey results of the August 2006 graduates and alumni survey (see appendices I and J). The participants recognised that the modules they found most interesting were those relevant to their personal lives/interests/studies, and those which allowed them to explore ways of applying the knowledge presented by the course faculty. Additionally,

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12 ESTS survey results are presented and discussed in section 5.5 Academic Development.
74 per cent of the student cohort believed that the multicultural aspect had a significant impact on their learning experience and understanding of sustainable development as it provided them with a global perspective. Of the cohort, 55 per cent recognised the multidisciplinary aspect of the program as being significant as it provided them with an understanding of sustainable development from different disciplinary perspectives. Of the cohort, 52 per cent recognised the social/personal element of the program citing that they had been inspired and motivated by other participants while continually learning about themselves. Of the cohort, 42 per cent identified the academic program as having an impact on their learning, recognising interesting subject material supplemented with high levels of participation and interaction. Of the cohort, 35 per cent identified the physical location of the seminar as having an impact on their learning experience:

*I have had plenty of experiences in multicultural programs, but this program is unique in that the location is remote but beautiful and reasonably self-sustaining, and the opportunity to hear such esteemed academics and professionals delivering presentations was a rich experience.*

An impressive 97 per cent of the student cohort enjoyed the flexible and interactive delivery of the learning program. Two particular delivery methods were highlighted as facilitating an enjoyable learning experience and improving understanding: experiential learning and group work. These will be outlined in more detail below.

*Experiential learning*

- **Field trips**

  Student feedback on the use of field trips as an alternative approach to content delivery was varied. Students commented that the field trips provided them with a unique opportunity to experience how some of the principles taught in theoretical sections of the course were being used in local practice. The field trips added to the student experience by providing them with information about the local culture and environment in an interesting and enjoyable way. These experiences facilitated a deep emotional connection with the natural surroundings. However, those who did not see the excursions as relevant felt that there was not a clear link between the different excursions and the modules.
• Artistic element of the program

The artistic element of the program provided participants with a visual representation of the theoretical elements of the program, and an opportunity to explore emotions associated with program content. Students who responded positively to the use of art as a learning tool commented that it presented new points of view on the subject material; it provided an emotional link between the participants and the program content; it provided a break in the methodical presentation of material (lectures) and linked the individual concepts being presented back to sustainable development as a whole; and it gave individuals confidence to think in different and innovative ways. Participants who did not enjoy the artistic element found it a little distracting and abstract.

Group work

The group work and simulation activities provided a variety of learning experiences and an opportunity for participants to hear and learn how others from different countries and cultural perspectives interpreted and understood sustainable development. Consequently, group work challenged their communication and negotiation skills; participants had to think about how they communicated with others, how to respect others’ opinions and value sets, and how to argue their point with tolerance and open-mindedness. Group work challenged individuals’ ability to work on a large project with tight deadlines, limited technical resources, and often complex group dynamics. Students commented that it was difficult to work with people who did not have the same levels of motivation or opinions, and that it required patience and understanding in order to share ideas and communicate with others.

There were some similarities from the alumni survey. All recognised that the most important factors that contributed to the learning experience were:

• the diversity (both disciplinary and multicultural) of the participants and facilitators

• the complete immersion in the YES environment, which made the learning experience a very deep one
• the mix of social and academic experiences, especially the use of group work and field trips, providing an overall experience that was very engaging

• the focus on student participation and interaction

• the element of fun that the YES course brought to learning

• the organisation of the modules and the knowledge and expertise of the faculty

• the planning and coordination of the course and the balance in terms of group work

• plenary lecture sessions and the diverse experience and disciplines of the student participants

• the combination of learning and teaching methods, i.e. group work, outdoor activities, interactive presentations.

The alumni who responded to the survey commented that they enjoyed the structure of the learning program (lectures, field trips etc.) as they felt that the program, despite being an incredibly intensive one, had provided them a valuable mix of sustainable development theory and practice. Additionally, they believed that the variety of activities provided a complementary experience that integrated a range of issues and grounded them in real-world experiences. Alumni respondents believed that the program made excellent use of the local resources available and that this made learning interesting and practical. However, it was suggested that there be less theoretical content and a greater focus on the practical application of sustainable development.

The graduating August 2006 cohort stated that their expectations prior to undertaking the program were to increase their theoretical and practical knowledge about sustainable development. They expected to achieve this by working and learning from those currently leading the field in research and practice, and by sharing their knowledge, and learning from other students’ experiences within a facilitated forum. Of the respondents 35 per cent believed that all their expectations had been met; 52 per cent believed some of their expectations had been met, while 13 per cent were unsure. Respondents commented that this was a result of a good mix of theoretical and practical knowledge from different disciplinary and cultural perspectives, allowing them to develop
a holistic understanding of sustainable development. Respondents also commented that the mix of delivery methods and the faculty created a safe learning environment where ideas could be shared. However, it was mentioned that most of the content was aimed at the least knowledgeable and that deep discussion on sustainable development issues and how to implement real change was lacking.

Of the August 2006 graduates, 70 per cent responded that their definition of sustainable development had not changed after completing the course, and many cited the Brundtland definition as the one they used. However, some respondents commented that their initial understanding of this definition was simplistic and they now had a deeper, more holistic, understanding of it as a result of their participation in the program. Respondents commented that they now considered other perspectives and priorities (both how and why these issues occur nationally and internationally), and the impact that this has on the translation of theory into practice. Respondents commented that they recognised that the concept of sustainable development needs to be thought about in specific contexts to be truly understood and if change initiatives are to result in lasting change.

The response from the alumni survey was similar with 65 per cent citing that the YES program had informed their definition of sustainable development. The respondents believed that the program informed these definitions by providing personal meaning to each participant. Of respondents 70 per cent believed that experience beyond the YES program had continued to inform their definition of sustainable development. These experiences included their own research (personal, professional or academic), life experiences, association with organisations and individuals who allowed them to reflect on their experience.

In terms of creating lasting change, 6 per cent of the alumni were undecided and 11 per cent disagreed that YES had influenced their personal and professional practice since completing the program. These respondents believed that they already had goals in line with that of the program and that the program simply broadened their outlook and reinforced their passions. Of the respondents, 30 per cent strongly agreed and 53 per cent agreed that the YES program made them more aware of their personal actions and the impacts on the environment; they now recognised that change begins with the
individual and that there are career opportunities in the sustainability area. The program was cited as providing participants with confidence in their abilities to tackle issues with full determination, and to be able work with people from diverse cultures and backgrounds.

5.5 Academic development

The ESTS structure and content evolved from the YES student course. The program did not focus heavily on theoretical materials, but on experiences and actions (materials on the theoretical underpinning of ESD were handed out as pre-reading material including a list of background literature and links). The seminar’s primary focus was on an exchange of practice through discussion forums rather than a teaching exercise, although participants were left with concrete examples of novel approaches to ESD.

Because of the nature of the selection process, the educators seminar was comprised of individuals committed and interested in improving their skills and knowledge in sustainable development, as was the YES course. This was reflected in the survey results of the ESTS participants, who all strongly believed that sustainable development skills and capabilities should be built into all university curricula and teaching. Respondents believed this is important, as universities educate future decision makers and therefore have a responsibility to provide such education. Respondents argued that there is urgency for change and that education is critical to create change in the next generation of professionals across all sectors of society.

ESTS respondents believed specific knowledge and skills are required to educate for sustainability in universities. Respondents commented that educators need to take a holistic, interdisciplinary approach with consideration given to both local and global implications of decisions and behaviours when developing curricula and when teaching. Additionally, respondents believed sustainability education requires academics to be system thinkers, to be empathetic, to be sensitive to other cultures, to value different perspectives, to have social competencies and to be creative. Respondents also recognised that different disciplines require different knowledge and skill sets, commenting that the context in which sustainability education is framed has implications for the way it is taught.
The ESTS approach to sustainability educational praxis focused on the development of sustainability knowledge skills and values, pedagogy and learning and teaching. All the participants of the ESTS program agreed that they enjoyed the structure of the learning program, i.e. being out of their home institution, its intensive nature, and multidisciplinary, multicultural approach. One participant commented that ‘it provided them with broad perspectives that are very critical when thinking and discussing education for sustainable development’. One third of respondents strongly agreed and one third agreed that they were satisfied with the program in terms of its providing them with the skills and ability to build sustainability concepts into their curriculum/research professional practice.

Of respondents, 75 per cent agreed that the course structure and content was relevant to their own teaching/learning/disciplinary practice. Respondents cited the following ‘most important’ factors contributing to their learning experience:

- interdisciplinary and holistic nature of the program
- open space (location)
- ability to share in the knowledge brought to the program by the different participants
- open minds that were not judgmental.

Despite participants’ obvious motivation, interest and desire to increase their skills for such education, when facilitating the ESTS program the ETHsustainability team recognised the need for sensitivity in relation to teachers teaching other teachers. It was difficult to have academics engage and explore different disciplinary perspectives, to move away from their particular field of focus. Associated with this was the resistance to thinking about changing their approach to learning and teaching especially toward more constructivist approaches. The faculty members commented that some academics have been using the same approach for years – they consider it to be effective for their particular field – and are unwilling to change. Faculty members recognised the difficulty in educating educators, citing that participants did not like to be taught how to teach by academics from different disciplines, different universities and of lower academic positions.
One faculty member commented that

*despite the fact that they might be more open minded as they are in an academic environment, teaching the teachers is a very grey area because there is more resistance to development as they feel they are already teachers*

and

*The educator seminar was about a self-motivated approach, but was very difficult as they were quite resistant. You had to be very careful about the material inputs you brought from professors lecturing them. We tried to get people to come and provide examples of how they had integrated these concepts into their program. This could be didactic or material, but they were quite resistant to another professor placed above them (as an expert) and then to be taught by them.*

Finally,

*We tried to bring the professor down to them, but hierarchy was still a problem because they are already quite ingrained in a hierarchical system.*

Another difficulty encountered was the difference in experiences and positions of the participants. Participants found it difficult to identify with others, as their experiences and positions were so varied. This resulted in individuals having very different ideas about how things could and should be done. One faculty member commented that ‘In the future I would do regionally specific work, very focused to a target group’.

One of the ETHsustainability faculty members commented that the focus of the ESTS seminar should have been more on sustainable development content as opposed to alternative ways of teaching. Participants of the ESTS program were more receptive to sustainable development content than being told how to teach. Experience from the program suggests that educators responded better to being given content and using that to develop curriculum material. It was commented that the academics within the program felt that they had been students for a long time, and this gave them their current status. Being lectured to was not going to provide them with the learning experience they
desired. The participants expressed the desire to be creative and to take information presented to them and to integrate it into something important. This was perceived as curriculum development.

The ETH sustainability faculty developed a number of learning and teaching strategies to encourage maximum participation. When not presenting, facilitators were encouraged to work with the participants, assuming the role of seminar participant. Presentations by the core team were kept to a minimum and as short as possible and there was a strong focus on active and self-directed learning.

When reflecting on the experience of the seminar, faculty members questioned its objectives, and suggested that these would need to be rewritten before it was run again. Unlike the YES program that so effectively uses a multidisciplinary approach, there is a strong case for a discipline-based seminar. While the multidisciplinary nature of the program has value in exploring sustainability issues, it can also act as a barrier. During the ESTS program when participants tried to establish a shared definition of sustainable development and education, it was clear that there was no shared language to work from. The different assumptions and experiences between participants led to a lot of debate and the identification of fundamental differences. While a consensus was reached on some core elements, there was more agreement on approaches to education than on definitions of sustainable development. Sustainable development was defined as a broad concept – of it being about a better future for humanity and all living things on the planet – but the vagueness of this concept was problematic when applied to different disciplinary contexts.

In spite of this, the faculty recognised that the very nature of sustainable development is multidisciplinary, and that it is critical to good educational practice to bring different disciplinary experiences together to create a rich learning experience. The interactive and multidisciplinary structure of the seminar encouraged participants to share their diverse cultural and disciplinary experiences in incorporating sustainability principles and issues in their own teaching. This allowed seminar participants to examine and explore economic, social and technical complexities in meeting the sustainability challenge and to gain better understanding of the need for multi-disciplinary perspectives for problem solving. It also provided opportunity for participants to identify common challenges to the
adoption of such approaches and to explore ways of meeting them. Additionally, participants found the interaction and learning from each other the most beneficial part of the course.

Consequently, the three areas of sustainability educational praxis were not equally developed in the educators seminar. The approach to learning and teaching recognised the need for innovative didactical and pedagogical methodologies. While this approach was practised by seminar faculty members, they were not successful in developing it adequately for participants to draw on these skills in their own practice. Sustainable development pedagogy as it relates to an individual’s praxis was not explored in detail with little deep discussion of disciplinary and personal practice and the relationship between the two. Given the level of resistance faced by participants in the areas of pedagogy and learning and teaching the faculty found it easier to focus on curriculum development. Consequently, real alternatives and commitment to a change in practice was not achieved. This was reflected in the survey results which found that 75 per cent of respondents disagreed and 25 per cent agreed that the program has enabled/assisted them in changing their curriculum and teaching /professional practice. In contrast, a third of respondents strongly agreed, a third agreed, while the remaining third didn’t know when asked if they were satisfied with the program in terms of providing them with the skills and ability to build sustainable development concepts into their curriculum/research professional practice.

The role of academic development in sustainability education is to explore the depth of disciplinary assumptions as they relate to understanding of education, sustainable development and the resultant praxis. The ESTS program has the potential to achieve such an objective if initiatives to overcome this resistance are identified and built into the program, with a focus on all areas of praxis, not just curriculum development. Another barrier to achieving the objectives of the seminar was the limited time frame of the program (one week). A further issue that limited the effectiveness of the ESTS seminar, in comparison to the YES course, was the removal of the case study research project as a continuing theme throughout the program. More time researching case studies would allow the participants to assimilate the material and integrate this into some kind of
product and output. This is especially important given that the participants were very self-motivated and good self-learners, and the program needed to reflect this.

Despite providing an intense uninterrupted learning experience, the seminar failed to initiate long-term change in education and sustainable development. Although participants believed they had access to good content and developed new networks, they felt that there was a lack of understanding and exploration of cultural and disciplinary barriers participants would face in their home institution. This was at least partly because the seminar sat outside of the participants' home institutions, and was developed and facilitated by academics from other universities, from a range of disciplines. By removing participants from the heart of their operations, the seminar failed to provide them with the skills to create change within their own professional practice, beyond what they were currently doing. This was reflected in the results of the surveys with 74 per cent of respondents disagreeing and only 25 per cent agreeing that the seminar had enabled/assisted them in changing their curriculum and teaching/professional practice. Faculty members recognised that for long-term change to result education programs must be structured over the long term.

5.6 Organisational change in universities for sustainability education

Change can occur within universities, particularly with respect to academic development, only when the role of the academic individual and the academic community in shaping workplace and disciplinary culture and practice is recognised (Chappell 2007; Keup et al. 2001; Nicholls 2001). The structure of the ESTS and the YES programs, however, is designed to remove participants from their workplace. There are benefits of an intensive program set outside participants' own institution in terms giving them a life-changing experience that create new ways of thinking and aspirations. One faculty member commented that:

Within society, our organisations and institutions there is a huge lack of awareness of the issues and challenges we are facing. There is a huge benefit in taking people out of their institution.
However, the consequence of this approach is that applying new knowledge back in a participant’s home institution is very hard, and it is difficult to support externally. Achieving long-term organisational change requires ongoing advice, support and understanding of the institution’s culture. One faculty member commented that

*the ultimate goal would be to be able to educate in both spheres. That is what we are trying to do with the program. Firstly we need to take people out of the environment they are constrained by, out of the systems and structures, so that they can think clearly in a new environment with new people and new ideas. Secondly facilitate the implementation of their new ideas and concepts when they return to this environment. I feel that is what is missing at this point – the disconnection in the two spheres.*

Respondents of the YES alumni surveys recognise this disconnection. 2 per cent strongly agreeing and 23 per cent agreeing that they had faced resistance when they tried to initiate sustainability initiatives, while 26 per cent were undecided, 38 per cent disagreed and 11 per cent strongly disagreed. Those who did not experience resistance thought this was because they worked in industries where people are already committed to sustainable development, or that they had been successful in articulating their ideas and the associated benefits. However, 89 per cent of the YES alumni respondents believed that the YES program contributes to the wider community, as it creates a community of professionals with sustainability as their common goal.

Those who experienced resistance to organisational change suggested that a paradigm shift is always going to be difficult to achieve, either though lack of knowledge, understanding of the urgency, interest or will. They suggested the following ways to overcome resistance:

- *Education and proper explanation.*
- *Increased communication across sectors.*
- *We must be able to be hard on the topics and soft on the people.*
• **Encourage people to make changes in their lives by explaining the differences by showing them easy ways to do it but most of all by living my life accordingly.**

• **Those of us who have had the fortune to be exposed to it and understand sustainability need to take some responsibility and become the leaders.**

• **Effectively providing clearer and practical examples of why things should be approached in a different ways trying to show the benefits of adopting a new way of doing things in your normal life.**

In addition the findings of this case study suggest that the ESTS program does not provide the required skills and content as they relate to the participants’ own working environments and therefore the level of impact and change in universities is limited. This is partly due to its location, i.e. removing participants from their own university where ‘practice occurs’. Additionally, the ESTS survey respondents did not feel that the faculty would be able to support them in this goal. One participant who had attempted to initiate change for sustainability stated that they faced resistance and were unsure of how to deal with this. Indeed, 50 per cent of ESTS respondents agreed that they had experienced resistance and were unsure how to overcome this. Of the respondents, 75 per cent disagreed with, and 25 per cent did not know if support from the YES team would provide them with assistance in the implementation of the learning outcomes of the course.

Despite this, half of the respondents strongly agreed that the ESTS would contribute to the wider community and disciplinary/professional practice. Participants felt that the program gave them an opportunity to meet and learn from academics from other parts of the world providing them with different perspectives on education and sustainable development and new shared insights. The program also provided a network of individuals to continue to learn and grow from in terms of the development of new skills and ideas. As one participant commented,

*It’s a good idea since many educators are very busy and unable to attend a longer workshop outside of the university.*
5.7 Conclusion

The YES and the ESTS approach to sustainability education sought to foster ethical and moral values to guide sustainable behaviour in students and academics. Neither education program provided definitions of sustainable development to participants, and content and pedagogy were kept open and flexible so they could be tailored to the needs of different groups. The pedagogical approach was learner-centred, based on contextual learning around real-world problems. The teaching and learning methods constructed were diverse and required active participation and self-directed leaning. Core skills developed included the capacity for participants to successfully devise solutions to global problems, through problem-based learning, critical and systemic thinking.

While the YES program benefited from a multicultural and multidisciplinary experience, this feature was not as beneficial for academic educators in the ESTS seminar. Discussion and the development of tools for engaging students with issues of sustainable development and education were not possible with an academic audience from different disciplines, as they had no shared language to work from. Recognition of different disciplinary assumptions was possible, but this was achieved only at a superficial level and did not influence deep discussion of sustainability education praxis.

The experience of the ESTS program identified the difficulties faced when teaching. While the faculty recognised that sustainability education embodies the need to understand sustainable development knowledge and improved teaching and learning skills and content, they felt they were best positioned to focus on content. The YES framework was suitable for developing sustainable development content knowledge, but improving teaching and learning skills will be successful only if it is provided within an academic’s own discipline area in the context of their own institutions.

Additionally, knowledge of organisational culture must be embedded into the education program for change in education practice to occur. The ETHsustainability approach to change management in universities focused on the ‘bottom-up’ approach to driving change. However, taking academics away from their home institutions and having them taught by individuals from another institution does not allow for an understanding of the
cultural and organisational barriers that must be addressed if any change initiative is to be successful. While participants of YES and ESTS recognised that they are now part of new networks, they did not feel that the program structure supported lasting change.
6  Case study 3: Forum for the Future: Education and Learning, London

6.1  Introduction

This case study examines the content framework, pedagogical approaches and learning objectives of the sustainability education programs implemented by Forum for the Future’s Education and Learning Department.\(^\text{13}\) Forum for the Future is one of the UK’s leading sustainable development charities, and works across all sectors of society through a range of partnerships and projects, with the aim of developing new policy and practices to meet sustainability challenges. From 1999 to 2003, Forum for the Future ran programs on organisational change and sustainability education, specifically, the Higher Education 21 (HE21) program (in 1999), and the Higher Educational Partnerships for Sustainability (HEPS) (2000–2003).

The aim of the HEPS program, built on the experience of HE21, was to establish partnerships with higher education institutions (HEIs) through positive engagement with the sustainable development agenda, and to generate the tools, guidance and inspiration that would encourage the rest of the sector to do likewise (Forum for the Future 2004a, 2004c). The objectives of the program were:

- To embed a strategic approach to sustainable development into partner organisations.
- To create a sense of common purpose and leadership amongst partner organisations in order to promote sector wide change.
- To design and trial a system for sustainability reporting that has broad support in the sector and is consistent with best practice within the sector, and is consistent with government policy.

\(^\text{13}\) At the end of 2006 Forum for the Future was restructured, and the Education and Learning Department no longer exists. Some of the responsibilities and projects written about here are now the responsibility of the newly formed Public Sector Department; others are now defunct.
To leave senior management in partner institutions with the knowledge, motivation and skills to structure sustainability into their strategic and operational planning processes, research policies and curriculum planning.

To build similar capacity in the HEI stakeholder community – local and regional government, funding councils, research councils, student organisations, suppliers, national government and the local community.

To complete a number of innovative partner-designed initiatives that drive forward the agenda, demonstrating clear benefits.

To develop materials and processes which are communicated and shared with partners, including the development of good practice (Forum for the Future 2004c, p. 1).

The HEPS program resulted in the development of the HEPS Curriculum Design Toolkit as a means of assisting academics in the area of sustainability education.

This case study explores how the key components of the SEAD theoretical framework of best practice developed in the literature review were defined, interpreted and applied by Forum for the Future’s Education and Learning Program:

• an ability for all involved to understand and reflect on their own construction of knowledge and worldview

• how sustainability was defined and understood as it related to education

• approaches to academic development

• organisational change for universities in sustainability education.

### 6.2 Forum for the Future case study methodology

The evaluation of Forum for the Future’s Education and Learning HEPS program was guided by an interpretivist paradigm and used both qualitative and quantitative research methods. Assessment of the program’s structure, methodology and content was undertaken using semi-structured interviews with key staff members. Two members of the Education and Learning team were selected to be interviewed based on their role within the department and the HEPS program, its delivery, and the development and evaluation of the HEPS Curriculum Design Toolkit. See Appendix A for a list of semi-
structured interview questions and Appendix K for a summary of the interviews. The findings from the interviews were then triangulated against the findings from documentary research. See Appendix C for a list of the documents used.

In order to determine how educational materials were being used by academics within the UK’s Higher Education Institutions (HEIs), a sustainability literacy survey was conducted in collaboration with Forum for the Future. A summary of the ‘Integrating Sustainability Literacy survey is presented in Appendix L. The aims of the survey were to identify good practice exemplars in order to learn from, and share, new innovative approaches currently being undertaken within higher education in the UK. The survey assumed that much of the work in the HEIs could be linked to the work of Forum for the Future through the HE21 and HEPS programs or their involvement in sustainability education policy at the national level. The survey was web-based and promoted using the subject centre network of the UK’s Higher Education Academy (HEA).

The survey asked academics to identify how their courses helped students to develop skills and knowledge and appreciate / critically examine the need for change to more sustainable behaviour. The survey also asked participants to identify how they had developed sustainability aspects of their courses and the barriers/opportunities they believed existed, and to record anything they considered innovative or successful. The survey sought to assess the degree to which HEIs in the UK had adopted the principles of ‘sustainability literacy’, as described by Forum for the Future and the UK’s education policy. The survey was conducted by the researcher as part of a three-month internship undertaken in 2006.

6.3 Findings

A complete set of responses from interviews is provided in Appendix K; a list of documents used in the documentary analysis is provided in Appendix C. The discussion below presents key findings from the HEPS project, using descriptive narrative and statistical analysis of participants’ experiences.
6.4 Approaches to sustainability education

Forum for the Future had little expertise in the area of education at the time of its conception, but it recognised that sustainability literacy for educators and learners was a major priority. In order to develop expertise and credibility in the area of sustainability and education, Forum for the Future recognised the importance of building its own capabilities. Consequently, Forum for the Future researched and developed the Masters in Sustainable Leadership. The aim of the masters program is to develop leadership skills for sustainable development. As described by one interviewee,

*Leaders tend to be anointed, appointed and elected, whereas leadership is something that can be exercised by anybody anywhere, whether it is in their own family or any part of the workplace or private life. So we are interested in leadership as a life skill and sustainability literacy leadership as a life skill for all.*

The Masters in Sustainable Leadership combines practice and theory to emphasise the link between leadership and sustainable development and then provide the scholars with the opportunity to apply those ideas in real-world contexts. It has the following course objectives:

- To create sustainability literate future leaders
- To demonstrate the viability of leadership for sustainable development programs and enable it to be duplicated around the world. (Forum for the Future 2006c, p. 1)

Forum recognised that employers do not necessarily want sustainability specialists, but want to be able to recruit from the usual range of disciplines confident that the graduates will be sustainability literate. With this knowledge and teaching experience Forum for the Future began their engagement within the higher education sector.

Through their experience in the masters program, the Education and Learning team recognised that definitions of sustainability and sustainable development were not helpful. They believed that sustainable development has been over defined, and that this has led to people resisting or disagreeing with set definitions. One interviewee commented that:
A lot of what Forum is about is moving away from a set of words that allows people to disagree all the time, and moving more towards discussions of what sort of world we want to live in, and what is a desirable type of future, and talking in those terms. This approach has resulted in an enormous amount of homogeneity in people’s responses, as we are able to come to a rough agreement and then work towards it.

Consequently, a flexible and dynamic approach to defining sustainable development was taken, with a focus on the development of sustainability competencies. Forum for the Future developed a set of intellectual and practical tools that allowed academics, and others in the sector, to define sustainable development and to help institutions think through any decision, large or small, in a sustainable development context. The HEPS program used two models to assist the development of sustainable development to partner institutions:

- Five Capitals Model
- Sustainability Appraisal Model.

The five capitals model challenged individuals or groups to consider how their operations within the university affected five different forms of capital – natural, human, social, manufactured and financial. This model was then operationalised through the sustainability appraisal grid, which placed the types of capital on one axis of a table, with the other axis showing the three ways in which any university operates: as a business, as a provider of learning and research and as a member of the community. This resulted in a 15-square grid which mapped how the university:

- already contributed to sustainable development
- would like to contribute in an ideal world
- would prioritise over any given period of time, in the real world (Forum for the Future 2004c)

Examples of the sustainability appraisal grid used as part of the HEPS program are presented in Appendix M.
The impacts and opportunities identified by the sustainability appraisal grid were then discussed in the context of the ‘12 Features of a Sustainable Future Model’. The 12 features were a series of statements describing what a sustainable society would look like. They were designed to be used as a guide to develop or appraise the policies and projects of the institution in question. Under the 12 features model, in a sustainable society:

1. there would be very low use of non-renewable resources
2. there would be minimal waste and emissions
3. there would be more green space and enhanced biodiversity
4. everyone would enjoy a high standard of health
5. people would be adept at social relationships and keep learning throughout their lives
6. people would have access to opportunities for employment, creativity and recreation
7. there would be trusted and accessible systems of governance and justice
8. there would be a sense of common purpose and shared positive values
9. institutions and other structures would promote change
10. there would be safe, supportive living and working environments
11. infrastructure would make best use of people’s innovation and skills
12. there would be a fairer valuation of natural, social, human and manufactured capital

(Forum for the Future 2004c, p. 6).

The approach to sustainability education used by Forum for the Future recognised the need for the development of the basic literacy that an individual would need to be able to live and work sustainably. They believed that the most effective approach to sustainable development was to integrate sustainability literacy into the content and delivery of all courses in all disciplines, and that this must be done in the context of an institution with a clear strategic approach to sustainable development. One interviewee described Forum for the Future’s definition of sustainability literacy as
a necessary part of teacher/academic education as building capacity for sustainability education in a classic change model which requires three things:

1 People have to understand the need for change.

2 People have to have the capabilities and the confidence to change.

3 People must become part of the change process themselves by being able to recognise and reward good behaviour in others.

Hence the rationale for the development of the sustainability education curriculum tools.

A definition of a sustainability literate person was developed as part of this process:

A sustainability literate person would be expected to:

- understand the need for change to a sustainable way of doing things, individually and collectively
- 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 (Forum for the Future 2004a, p. 9).

To assist in the development of sustainability literacy knowledge and skills (see Table 6.1) Forum for the Future then developed examples across the five forms of sustainability capital (natural, human, social, manufactured and financial), which academics could use as a guide in their course development. The following list provides some examples described by Forum for the Future:

- Natural Capital: Basic ecology, energy generation and supply, low carbon futures
- Human Capital: How to maintain health/wellbeing, understanding of equality and diversity, ethics, human rights
- Social Capital: Citizenship, government, local and regional strategies, risk, regulation, personal rights and responsibilities, effective organisations
- Manufactured Capital: Best practice in industry, environmental management, business case for sustainable development, material and energy use

- Financial Capital: Basic economics, value concepts, cost/benefit analysis, whole-life costing, funding streams (Forum for the Future 2004b, pp. 12–13).

The knowledge and skills identified here are largely generic, as it was believed that the way these were embedded should be determined by the individual’s professional and personal situation. Forum for the Future developed five overarching principles they believed should guide innovative course design and good teaching:

Table 6.1: Sustainability literacy knowledge and skills (adapted from Forum for the Future 2004b, p. 14)

<table>
<thead>
<tr>
<th>Understanding need for change</th>
<th>Knowledge and skills to act</th>
<th>Recognising and rewarding</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Long-term thinking</td>
<td>• Leadership (by example)</td>
<td>• Empathising</td>
</tr>
<tr>
<td>• Futures planning</td>
<td>• Parenting</td>
<td>• Communicating</td>
</tr>
<tr>
<td>• Solutions-orientated</td>
<td>• Teaching skills</td>
<td>• Appreciating others’</td>
</tr>
<tr>
<td>approach</td>
<td>• Creating ownership</td>
<td>views</td>
</tr>
<tr>
<td>• Articulating barriers/</td>
<td>• Managing information</td>
<td>• Developing/sustaining</td>
</tr>
<tr>
<td>opportunities</td>
<td>• Change management</td>
<td>relationships</td>
</tr>
<tr>
<td>• Critical thinking</td>
<td>• Patience, negotiation,</td>
<td>• Team working</td>
</tr>
<tr>
<td>• Assimilation/organisation</td>
<td>diplomacy</td>
<td>• Working with diversity</td>
</tr>
<tr>
<td>• Confidence to challenge</td>
<td>• Strategic visioning</td>
<td>• Managing stakeholder</td>
</tr>
<tr>
<td>• Confidence to go above</td>
<td>• Case-making</td>
<td>relationships</td>
</tr>
<tr>
<td>minimum standards</td>
<td>• Taking responsibility/leading</td>
<td>• Advocacy</td>
</tr>
<tr>
<td>• Listening/reflection</td>
<td>• Decision-making</td>
<td>• Consensus building</td>
</tr>
<tr>
<td>• Absorbing/giving information</td>
<td>• Linking legislation</td>
<td>• Capacity building</td>
</tr>
</tbody>
</table>

- The ‘at the same time’ rule should be applied: ‘the learner should learn how to analyse issues and choices from an environmental, social and economic perspective at the same time, rather than separately’ (p. 18).

- A learner-centred approach works best.
• Ethics and values matter: ‘If sustainability is to be achieved, the ethics and values that support it will be just as important as scientific and technological advance’ (p. 20).

• Sustainability literacy should be integrated into the content and delivery of all courses.

• Good learning practice is essential.

These five principles embody the following characteristics of sustainable development education – learner-centred, outcome-led, cross-curricula, practically based, group and individual learning, reflective practice, recognising the complex relationships of the real world, learning in context, the importance of informal learning experiences to complement the formal learning and an appreciation of the learner’s cultural and geographical history (Forum for the Future 2005a). Additionally, Forum for the Future considered that learning and educational praxis around sustainability literacy must include the following:

• How to find, carry out research and make judgements about the quality of information (eg Does it come from a reliable source? How to manage with gaps or uncertainty in knowledge?)

• How to solve problems creatively and abstract learning from doing so – in particular any principles that may be transferred to other situations, including those where considerable uncertainty reigns.

• How to abstract learning from experience in general. If most of our learning is informal, then techniques are needed to make the most of any experience (good or bad) including carrying forward the learning in a positive way.

• How to learn through reflection on experiences. Making connections to derive additional learning and how to translate that into changed action, sometimes known as transformative learning (Forum for the Future 2004a, p. 21).

Forum for the Future’s approach to sustainability education was described by one interviewee in the following way:

*It is about recognising what you value. And then when you choose to make decisions, you reflect on that and make a decision based in terms of the*
outcomes you are able recognise. Because you are able to see things differently, because you are able think differently, because you were taught in a different way. Sustainable development simply means development patterns for people that have the capacity to continue into the long term. Part of that is the ethics that we use to shape and govern what we want to do, the values we apply in everyday life, but it also includes that broadness of realising that this is not a narrow thing.

### 6.5 Academic development

The HEPS program supported 18 UK HEIs working in partnership to develop and implement their own sustainable development (SD) strategies whilst building the capacity of senior managers. The HEPS program worked across four areas of HEIs (research, curriculum, business and community), recognising the impacts that each area has on the environment, the economy and society (see Figure 6.1). By taking each of these areas in turn, HEPS offered a framework which had the potential to produce graduates capable of accelerating change towards a more sustainable society. Although all staff in HEIs were seen to have a role to play, the particular role of academics was recognised as crucial in recognising the linkages between all areas of work (Johnston & Buckland 2002).

Figure 6.1: HEPS approach (Johnston & Buckland 2002, p. 16)
At the time, the HEPS program was innovative in that it was structured using a consistently applied framework for understanding sustainable development that is intellectually coherent and practical. The activities undertaken by Forum for the Future and partner institutions had four main strands of activity:

- sustainability reviews: to identify partners’ strengths and opportunities to change
- individual work programs: to help partners deliver their own objectives
- partnership-wide initiatives: to develop tools and guidance for the sector
- influencing strategy: to cascade learning to others and influence policy (Forum for the Future 2004c, p. 3)

For details of these programs, see Appendix N.

One of the four areas of work within the HEPS program focused on academic development in curriculum and education, undertaken using the HEPS Curriculum Design Toolkit. The toolkit was developed with the aim of providing transferable tools and guidance to support action by individuals and institutions, avoiding the ‘one-size-fits-all’ fallacy (Forum for the Future 2005a). To integrate sustainable development into the design of all types of learning activities, Forum for the Future developed the HEPS Curriculum Design Toolkit. The toolkit is a competency-based approach leading to transformative learning rather than transmissive learning as defined by Sterling (2001). It advocates for an analysis of the relationships and needs of the learner with regard to sustainability, then looks at the basic knowledge and skills needed to establish a basis for learning. The toolkit then looks at a spectrum of competencies that might need to be developed to deliver these outcomes. This toolkit is presented in Appendix O. The associated methodology was based on a pedagogy that was:

- Learner focused
- Holistic in nature.
- Outcome led
- Compatible with the learning (Johnston & Buckland 2002, p. 17).
The HEPS Curriculum Design Toolkit took the user through the following seven steps to curriculum design (for more details see Appendix O):

1. Mapping the learner’s world
2. Making ethics and values explicit
3. Determining sustainability competencies
4. Identifying learning outcomes and specific knowledge, understanding and skills and assessment procedures.
5. Deciding on the best delivery methodology
6. Promoting the course
7. Reviewing and renewing the course (Forum for the Future 2005a p. 29).

The toolkit was designed to be appropriate for one-day training sessions, whole degrees, new or existing courses or continuing professional development programs.

As part of the HEPS program, Forum for the Future’s Education and Learning team worked one-on-one and in small groups with academics to guide the implementation of the toolkit. However, the toolkit was developed so that it could be implemented by anyone without guidance and was freely available on Forum for the Future’s website. The rationale for this approach was explained by one interviewee as:

[It] enables organisations like Forum for the Future and other enthusiasts to lobby and encourage without telling lecturers how to lecture, so it is empowering for lecturers because we are just saying from our perspective this is the ideal outcome … over to you.

In a critique of the approach to sustainability education used by Forum for the Future, Sterling and Scott (2008) recognise that it draws on the concept of sustainability praxis; the toolkit maps the context of the learner, and this includes a values audit to keep course development on track. They argue, however, that there is still confusion about the difference between ‘embedding sustainable development in education’ (p. 391), and reorientation towards ‘education for sustainable development’ as a more holistic response involving cultural change. Within HEIs in the UK, sustainability and ESD are
perceived as a change in curricula content, rather than pedagogic change and renewal. Scott & Gough (2004) argue that this is a result of a number of issues relating to the development and delivery of the HEPS curriculum design toolkit:

- Elaborate pedagogies are not always necessary.

- People do not learn things just because educators think they are important:
  
  The toolkit sets out a clear ‘expert’ element which is considered to be beyond the scope of negotiation in that the toolkit ranks knowledge and sets learning objectives in relation to its pre-specified ‘twelve features of a sustainable society’ (Scott & Gough 2004, p. 239).

- Social change must recognise the role of informal learning.

- There is a lack of guidance in interpreting and implementing the toolkit.

Additionally, the approach to learning is more managerial than emancipatory, as it is founded in thinking that originates in economies and in natural science (Sterling & Scott 2008). The measurable learning outcomes of the toolkit are informed by the “‘twelve features of a sustainable society”, rather than a pedagogy of individual and collective self-discovery’ (p. 230), and as such, learning is then seen as ‘instrumental to the achievement of sustainable development, rather than being, of itself, a vital and substantial aspect of any ongoing process of sustainable development’ (p. 239). Scott and Gough (2004) argue that Forum for the Future’s curriculum toolkit exhibits a worldview that is radical and manipulative, and that the pedagogies overwhelmingly lean towards the development of a world that is founded on egalitarian principles. The authors argue this is unrealistic and unattainable and that the toolkit does not consider other worldviews and rationalities; they believe equity across the economy, society and environmental is not possible, especially against the twelve criteria that define a sustainable society.

Further, Scott and Gough (2004) suggest that a detailed toolkit can become ‘over-prescriptive about what counts as sustainable development, or as learning that contributes to it’ (p. 244). How to achieve ‘sustainable development’ and all it entails is still largely unknown, and thus knowledge on sustainable development and approaches to teaching can develop only through shared practice. Applications of prescriptive
The ‘Integrating Sustainability Literacy’ survey was inconclusive regarding the depth to which the approach to sustainability literacy of Forum for the Future and UK education policy has been embedded into the educational praxis of the UK’s HEI. This is in part due to the low response rate to the survey, with only 13 responses to a survey promoted to all academics throughout the HEI subject centre network. While the information that was provided illustrated innovative approaches to sustainability literacy and education there was not enough information to determine a whole of sector approach. I have concluded that surveying academics is not the best approach to obtaining information about learning and teaching practices and that toolkit approaches to educational change are most successful when guidance and direction is provided. This concurs with Forum for the Future in their assessment of the HEPS program, who recognised that working with academics to integrate sustainable development into the curriculum is very difficult in practice. Some of the barriers identified were: the perception that the curriculum was ‘already too full’ and the difficulty of obtaining co-operation from colleagues in other departments. Interviewees from Forum for the Future commented:

"Most difficult was engaging with the curriculum and research and … in retrospect I don’t think we tackled it right. We believed it when they said that it was too difficult and too controversial and that we were wrong. We were too passive in shipping it to one side, and when we did the evaluation they admitted they [were] not wanting to engage with it – it was too difficult.

Engagement with the universities involved with HEPS was very much focused on them identifying their needs and ways we could help them; Forum was led by the partners. As we proceeded through the project it became apparent that work on sustainability literacy in the curriculum was not proceeding very well and not much was happening. This was a huge criticism of the program, because core business is teaching, and learning and research, not energy efficiency programs, and all the work was occurring in the property services area."
I think we faced resistance within the academic community towards sustainability education because it is a language and a capacity issue. At one level individuals don’t really understand what sustainable development is and therefore do not recognise its potential to be a useful way of articulating the broader purpose. There is also an issue with the management structure within higher education. People who run universities are chief executives who are driven by targets; they are not necessarily visionaries from the old school who are even interested in why the higher purpose for higher education is leading change.

Forum for the Future identified two key messages from HEPS work on curriculum:

1. It is best to think of sustainability as a non-discipline – it is more about the intellectual and practical tools that enable people to decide and act in a way that favours sustainable development than it is about significant additions to course content.

2. The market for sustainability specialists is likely to be small. Employers are looking for sustainability literate employers across all disciplines (Forum for the Future 2005b, p. 6).

While the toolkit allowed for the development of sustainability knowledge and skills within a disciplinary context, because of its generic nature, the depth of take-up was dependent on an individual’s professional and personal situation (Murray & Murray 2007). Forum for the Future’s approach does not explicitly deal with the issue of motivation, but simply equipping individuals with the appropriate knowledge and skills does not guarantee that they will be fully utilised. Values and beliefs have a vitally important role in developing behaviour, yet we may not be as aware of our own attitudes, emotions and other internal states as we might like to think we are (Bem 1971, p. 2). Forum for the Future emphasises the relevance of values (Forum for the Future 2000, p. 8; Parkin et al. 2004, p. 18), but does not explore their role in sustainability education in depth. For academic development to occur in any subject as it relates to educational praxis, academics must experience confrontation and develop self-awareness if they are to recognise the limitations of current practice and identify and adopt alternative approaches (Ho 2000).
6.6 Organisational change in universities for sustainability education

Although the HEPS approach to academic development did not lead to a wide adoption of sustainability literacy in HEI in the UK, the program was successful in influencing governance and leadership within the higher education sectors (Forum for the Future 2004c; Sterling & Scott 2008). At the completion of the program all 18 partners had either embedded a strategic approach to sustainable development into their governance and planning systems, or had established the mechanisms (such as policy development groups) to enable this to happen (Forum for the Future 2004c; Sterling & Scott 2008). Since 2000, nine university-wide sustainability groups have been established, eight partners have made specific reference to sustainable development in their strategic plans, and nine have adopted (or, at the time of writing, were close to adopting) sustainability policies. Among the universities involved, it was recognised that a successful policy requires input from all key parties, endorsement by senior management, mechanisms and resources to deliver on the promise, and effective internal and external communication (Forum for the Future 2004c; Johnston & Buckland 2002).

Forum for the Future used a ‘whole of sector’ approach to achieve organisational change. To facilitate the incorporation of sustainability literacy into educational praxis, Forum for the Future aimed to influence national policies and develop cross-sector links, to develop leadership within universities and to disseminate guidance documents and practical tools. One interviewee commented,

\textit{We have a very straightforward mantra which we apply. In order to get a system to change you have to work with the most important components within that system and this includes:}

1. \textit{Capacity building, mainly of senior managers but sometimes others}

2. \textit{Getting into the organisation policy framework – at its simplest getting the word sustainability in there: at a more sophisticated level; getting them to change their HR purchasing etc.}
3 Looking at national policy framework that they operate within and getting that changed to facilitate them wanting to be more sustainable

4 Providing tools [the HEPS Curriculum Design Toolkit] – the tricky stuff which once everyone has decided that it is a great thing to do and you [are] still not quite sure how to do it e.g. carbon trading

5 Areas of recognition and reward … so within the system getting a positive feedback loop working as well, so those people who take a chance and grapple with the sustainability agenda don’t get punished but are actually rewarded for it.

Forum for the Future’s work was focused in the following areas:

• government policy and agencies

• professional bodies

• higher education institutions.

6.6.1 Government policy and agencies

Forum for the Future’s approach to organisational change ensured that the government policy – the Higher Education Bill and the strategies of the funding councils – that guided and informed learning and teaching within the higher education sector embodied the key principles of sustainability literacy. Forum for the Future worked closely with Higher Education Funding Council for Education (HEFCE) and the Higher Education Academy (HEA) to develop programs and initiatives that supported the development of sustainability literacy. This systemic approach to change was in part possible because of the team and their professional experience in education and politics. This experience provided an understanding and ability to positively influence the incorporation of sustainability principles into government policy. Consequently, the programs initiated and operated within the Education and Learning Department tied in closely with the sustainable development policy and strategy within the UK Forum for the Future helped shape the following government policies and strategies:


• In 2004, the HEA was launched to bring together the functions of the Institute for Learning and Teaching in Higher Education and the Learning and Teaching Support Network’s (LTSN)\(^{14}\) generic centre and its subject centres, which remain as a network of 24 different disciplinary centres. One strand of activity was the funding of individual subject centre projects. The HEA was expected to help deliver the sustainable development strategy and action plan for the HEFCE\(^{15}\), launched in 2005.

• See Appendix P for a history of the development of the UK’s education policy.

### 6.6.2 Professional bodies

Forum for the Future worked with professional bodies to help develop requirements and guidelines for education and training related to sustainability. It was believed that additional pressure from professional bodies for graduates with sustainability skills would have some impact on the content of degree courses offered by universities. In 2005 Forum for the Future initiated two programs funded in part by UK Department for the Environment, Food and Rural Affairs (Defra):

• Engineers for the 21st Century, which works with government, the engineering profession, pioneering companies and the emerging generation of engineering leaders to identify and remove the barriers to embedding sustainability into teaching, policy and practice.

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\(^{14}\) The LTSN Generic Centre’s mission was to broker information and knowledge to facilitate a more co-ordinated approach to enhancing learning and teaching. The Generic Centre has four main project areas: assessment, employability, e-learning, and widening participation. The site provides a number of resources including circulars and newsletters, and a resources database <http://www.library.qut.edu.au/services/teaching/guide/websites.jsp>.

\(^{15}\) The HEFCE is a non-departmental public body which distributes money provided by the government to institutions carrying out higher education teaching and research. It is responsible for monitoring the financial health of such institutions and has a role in ensuring quality and good practice (Katayama & Gough 2008).
• Professions in Partnership for Sustainability (PIPS): Forum for the Future supports a learning partnership with a range of professionals to help them identify and develop the skills they need to make sustainability a reality in their working lives. Representative organisations from accounting, engineering, surveying and design professions are the ‘champion partners’, but a range of other professions were included in the PIPs initiative, and the sharing of experience between professions is a key part of the program. The program focuses on achieving practical change through supporting professional education and improved curricula and institutional standards to promote sustainability. The assumption is that an emphasis on professions is an essential change element of ESD, particularly to encourage young professionals.

6.6.3 Higher educational institutions

Forum for the Future’s education initiatives were embedded in the HE21 and HEPS programs, discussed in section 6.5. In 2005, the Sustainability Integration Group (SIGnet) was developed as a network of bodies that fund, plan and regulate the post-school sector. The network brings together senior members of these organisations to work together to integrate sustainability literacy across the education system. It builds understanding and capacity, whilst simultaneously demonstrating that the implementation of sustainability strategic objectives can be successfully achieved in the post-16 education sector. The focus on cross-sector co-operation promotes joined-up action by the various stakeholders involved. The main objectives of the initiative are:

• to work together to facilitate and support the integration of sustainability literacy into curricula

• to create students who understand the need for change to a sustainable way of doing things, individually and collectively

• to create students who have sufficient knowledge and skills to decide and act in a way that favours sustainable development

• to create students who will be able to recognise and reward other people’s decisions and actions that favour sustainable development (Sterling & Scott 2008).

6.6.4 Success of the Forum for the Future approach

Forum for the Future’s approach to organisational change addressed policy and upper management structures within HEIs and external professional bodies in an attempt to create a culture that embraces change by decreasing resistance from the top down. While their work aimed to provide guidance and leadership, Sterling and Scott (2008) argue that HEIs do not respond to this approach. Unless they are driven by their internal and external communities, ESD initiatives will not be successful in higher education institutions. This is a reflection of the ‘notional independence English HEIs from government where there is a fine, but important, line between offering support to the HE sector, and attempting to steer it in a particular way’ (Sterling & Scott 2008, p. 389). The more government prescribe desired directions and outcomes the less likely the HEIs are to respond and act. Katayama and Gough (2008) argue that it cannot be assumed that interventions designed to promote sustainable development in other institutions are appropriate in the higher education sector.

Centralised top–down intervention is significantly different from bottom–up initiatives and is likely to result in bolt-on approaches to integrating sustainability into curriculum, rather than deep, embedded change. Regardless of the excellence of such approaches, it is unlikely that significant change will be achieved, particularly if the expertise guiding and defining sustainable development in an educational and professional context is seen as being ‘external’. Scott and Gough (2004) argue that teaching staff in universities ‘know that their job is to promote learning by their students, rather than to promote sustainable development, and may well resent being told that their priorities ought to be otherwise’ (Scott & Gough 2004, p. 245).

Forum for the Future’s experiences implementing HE21 and HEPS supported the findings of Scott and Gough (2004), highlighting unresolved tension between the desire for autonomy within institutions such as universities and the need for rapid, whole of
sector transformation. This casts doubt on whether the HEPS model can provide the appropriate framework to create change, as the political context in which HEIs function means there is sometimes conflict between the autonomy that is vigorously defended by universities and the need for swift sector-wide adoption of sustainable development. Forum for the Future recognise that there are insufficient resources to facilitate the change required and that the successes of HEPS came from the allocation of specific resources.

Despite the failings of such initiatives and the disparate outcomes, Forum for the Future (2006b) and Sterling and Scott (2008) recognise that they have acted as a driver for change. The HEIs emphasise that support and pressure from the bodies that frame and influence higher education (funding councils, government, and accreditation boards) are welcome incentives to action. Sterling and Scott (2008, p. 388) summarise:

> the interest and activities of agencies external to HEIs have been key to the growth of SD-related work in universities, building on the existing SD interests of institutions, and individual academics, through research, consultancy, teaching, and management.

### 6.7 Conclusion

Forum for the Future’s approach to sustainability education was not about definitions, but focused on the development of literacy and competencies that would result in sustainability literate graduates. Central to Forum for the Future’s approach to change within the higher education sector was the creation of a broad culture of change by working across several areas of the sector in a systemic way, using centralised, top-down strategies. Change was initiated within government through the development of policy and within professional bodies through specific programs to help develop requirements and guidelines for education and training related to sustainability. Change was also directly sought within higher education institutions in the areas of research, curriculum, business and community as part of the HEPS program. The HEPS program provided a benchmark that aimed to raise the sectoral norm, provided positive partnerships that supported practical action by organisations whilst promoting a collective understanding of sustainable development through sharing of experiences.
As part of Forum for the Future’s approach to academic development, they developed the HEPS Curriculum Design Toolkit, which was designed to be used ‘in-situ’, with limited assistance by Forum for the Future. But if academic development is to be successful and enable change in educational praxis, academics must experience confrontation, self-awareness, availability of alternatives, and the building commitment to a new conception. It is very difficult for academics to experience these phases without intensive guidance. Despite being developed to be adapted to any discipline, it was considered by some to be too prescriptive. Furthermore, it was developed outside HEIs by non-academics, and this resulted in poor acceptance of the material. Consequently, the level of change in educational practice and praxis that resulted from the toolkit was limited.

Theoretically, a top–down approach to change by influencing government policy, coupled with programs like HE21 and HEPS working on the ground across all levels of HEIs, should have resulted in widespread transformative change. However, the level of interaction within the HEIs was not adequate to gain the support needed. An assessment of the strengths and weakness of the HE21 and the HEPS programs by Forum for the Future recognised that the programs were focused on achieving the final transformation of the sector rather than facilitating the process of change. Organisations and bodies were segregated by type of change needed to make the transformation to sustainable development. The tailored approach was seen as vital for successful influence on the sector. Their experience within these programs acknowledged an unresolved tension between individual autonomy of institutions and the need for rapid transformation of the whole sector. Consequently, doubt was cast on whether the HEPS model can provide the appropriate framework for this.

This is not to say that the work of Forum for the Future’s Education and Learning program has been in vain. Much has resulted directly and indirectly from the HE21 and HEPS programs and there are many examples of excellent practice in interdisciplinary teaching and widespread acknowledgement of sustainability education in higher education. However, barriers to change remain: institutional inertia, pedagogic complexity and disciplinary conservatism (Katayama & Gough 2008). These barriers provide evidence that many different approaches to achieving change are required,
including that we need to value that which we continue to learn, ‘to develop policy through a process of challenge, rather than merely implementing it through learning what others already (believe themselves to) know’ (Katayama & Gough 2008, p. 421).
7 Synthesis of sustainable education SEAD framework and case studies and conclusions

This thesis recognises academic development as one means of reorientating education within universities to include sustainability principles and to nurture the development of sustainability educational praxis. It explores alternative practices for delivering sustainability education within universities and investigates how we prepare our tertiary educators to teach and challenge students. Specifically, it identifies requirements of academic development programs that will provide educators with the skills to engage students with the ideas of sustainable development.

In order to determine what an ideal academic development program for sustainability education might look like, a theoretical framework for sustainable education academic development (SEAD) programs was constructed, based on an analysis of the literature in the areas of sustainability education, academic development and organisational change. Three international case studies have been presented in which alternative approaches to academic development in sustainability have been critically evaluated. The case studies have been examined in terms of their interpretation of sustainability education, their approaches to academic development and their ability to achieve wider organisational change within universities.

The following discussion compares the findings of the case studies with the theoretical framework to identify the features of academic development programs that are most likely to result in lasting change for sustainability.

7.1 Sustainability education

7.1.1 Definitions

Findings from each of the three case studies concurred with the SEAD framework regarding definitions of sustainability and/or sustainable development. All three case studies recognised the limitations of enforcing a ‘one size fits all’ approach when working both with students and academics, and found that definitions of sustainability are most useful if they are informed by professional and personal experience. The
academic development programs explored in the case studies assisted academics and students to develop a deeper understanding of their own definition of sustainability. Subsequently, participants felt that they had a greater understanding of the consequences of their decisions and actions, both personally and professionally. This is a critical first step in developing sustainability education praxis (Kemmis 2009; Kemmis & Grootenboer 2008). However, more than a deeper understanding of their definition of sustainability was required for participants of these programs to evolve their sustainability education practice into praxis. If a transformational change in practice is to result, participants must explore and understand the way they construct their definition and the limitations this has on their own praxis. This can be achieved only through critical reflection, and the ability to recognise their own disciplinary culture and worldview. Academic development programs must provide the motivation, knowledge support, and staff with this capacity if their participants are to move beyond the first step.

### 7.1.2 Sustainability educational praxis

The SEAD framework recognises the need for education to be informed by educational praxis rather than practice alone. Sustainability education requires that the links between pedagogy, learning and teaching practice, and curriculum development are recognised and critiqued against individuals’ own recognised worldview, values and assumptions. The case studies investigated in this thesis developed their programs from constructivist pedagogies, resulting in an educational approach that was experiential, learner-centred, and required participants to think systemically and critically. Approaches to learning and teaching and curriculum development within each case study were also consistent with the approaches identified in the SEAD framework. Learning and teaching objectives of these programs identified both the need for sustainability skills/competencies/literacy and discipline-specific sustainability content.

What varied significantly among the case studies was the ability of those delivering the programs to develop and use the skills they were fostering in the participants. This reflected a lack of focus (or ability) on the continuing development of their pedagogy and subsequent praxis. Approaching academic development from a sustainability education perspective requires educators (lecturers) to move out of their comfort zone and rethink their conceptions of learning and teaching, consistently engaging and developing their own pedagogy. This approach places
academic educators in the position of learner. It requires them to think through the moral purpose associated with their learning and teaching, curriculum and disciplinary practice, not just its role in maintaining current professional practice. It requires them to recognise that there are wider consequences of the knowledge acquired within the classroom, which affect the learner’s actions within society (Murray, Brown & Murray 2007; Murray & Cotgrave 2007).

The BELP project focused heavily on the development of learning and teaching skills, and the ability to select appropriate content. It did not have a strong focus on the explorations of disciplinary assumptions and the role they play in shaping praxis, that is, the development of a sustainability pedagogy, learning and teaching and curriculum development against an individual’s worldview. While the project asked academics to deliver materials that challenged students’ own assumptions and resulting practices, the program did not challenge the academics to do the same. This was reflected in the acceptance of personal definitions of sustainability/sustainable development without asking academics to explore the construction of these definitions from both a personal and disciplinary perspective. Consequently, the materials developed did not have a long lifespan after the completion of the project and the depth to which sustainability/sustainable development education was explored was not genuinely transformative.

The YES model attempted to embed learning and teaching and curriculum consistent with a sustainability education approach, but again failed to explore in detail the constructions of definitions relative to subsequent sustainability education praxis. Both ESTS and YES predominantly focused on the development of sustainability knowledge rather than on professional practice and ongoing skills relating to reflective critical and systemic practice.

Forum for the Future’s HEPS Sustainability Education Curriculum Toolkit paid particular attention to pedagogy, learning and teaching practice and the development of curricular knowledge. However, the program was criticised for being overly prescriptive regarding predefined skills and capabilities.

The three academic development programs on sustainability education explored in this thesis excelled in the area of learning and teaching and curriculum development identified in the literature review and defined as best practice in the SEAD framework. However they did not specifically focus on developing and exploring
greater understanding of pedagogy and praxis and the implications for the improvement and understanding of learning and learning and teaching practice, curriculum development and the development of their own pedagogical knowledge. Despite the recognised role of ethics and values in sustainability education, the approaches taken by each case study failed in each participant exploring their own worldview and associated disciplinary, cultural and personal assumptions. Consequently, the programs did not result in creating the level of ‘self-awareness’ required for a transition from educational practice to praxis or achieve third-order learning and practice in sustainability education. This can be attributed to a lack of ability on behalf of those running the programs in terms of their own ability and its translation into the learning a teaching embedded into the program itself.

### 7.2 Academic development

Sustainability education praxis requires the development of knowledge and skills in areas of pedagogy, learning and teaching and curriculum development. Additionally, the SEAD framework recognised the same areas as relevant to the success of academic development programs. As with definitions of sustainability and sustainability education disciplinary experience, culture and traditions must be recognised if a change in practice is to result. This will only occur if academics are able to recognise and reflect on the issues embedded in their own practice, and are then able to explore new and alternative approaches. Jarvis (1999) argues that practitioners must engage in developing theory from practice if they are to develop a meaningful teaching practice and to develop appropriate pedagogies and curriculum. If this form of engagement and reflection occurs, then the quality of education will improve.

All of the academic development programs explored in this thesis recognised and utilised the skills required to enable, understand and effect change, including reflective practice, systemic and critical thinking and problem solving to allow for reflection and deep learning. However, the degree to which educators adopted new approaches to educational practice evolving to praxis in each program varied, and this was a direct reflection of the experience of participants and the structure of the development programs. The success of the programs was inextricably linked to the educators’ understanding of sustainability and the degree to which their own practice reflected this understanding. Success hinged on whether the academics involved in
the development and delivery of academic development programs were proficient and active in deep reflective practice and conscious of continually exploring their own worldviews and the effect this has on their pedagogy, teaching and learning skills and curriculum development. Whilst all of the programs allowed flexible definitions of sustainability, the degree to which these definitions and associated pedagogical, instructional and curricular practices evolved into transformative leanings was dependent on the approaches used in the facilitation of the programs.

The SEAD framework identified four phases required for academic development to facilitate change: confrontation, self-awareness, availability of alternatives and building commitment. Central to these phases was transformative learning; where participants began the process of re-evaluation of their past-beliefs legitimated by shared disciplinary assumptions. Transformative learning is ‘becoming critically aware of one’s own tacit assumptions and expectations and those of others and assessing their relevance for making an interpretation’ (Mezirow 2000, p. 4), each case study approached these phases with different emphasis, and this resulted in different levels of awareness.

The approach taken by the BELP and ESTS programs was to work directly with academic staff, but the level of confrontation was minimal, and focused academic development in the areas of curriculum content. While this is an appropriate way to start, neither of the programs ran for adequate time or were structured in a way that would result in deep exploration, reflection (self-awareness) and questioning of practice. While the case studies provided alternative approaches to education and focused on developing skills, capacity and commitments from their participants, without this higher level of awareness, deep-seated change was not possible. The toolkit approach taken by Forum for the Future was publicly available and used ‘in-situ’. The level of guidance given to participants regarding its application depended on whether or not the organisation was a HEPS ‘partner university’. Again, as a result of the lack of adequate guidance, the depth to which assumptions and practice were questioned was limited.

The SEAD Framework recognises that the relationship between academic development, learning and the scholarship of teaching is essential to facilitating and developing sustainability education. Successful academic development requires teaching and learning to be perceived and understood in an academic and scholarly
way. Teaching is often thought of as a range of activities that involve the learner either passively or actively engaged in some form of activity, on the assumption that learning will be associated with that activity. The connection between the ‘teaching’ and the learner is often not understood or embraced by the academic. Despite the fact that participants in each program were volunteers and were interested in sustainability education, there was resistance to discussion of improving teaching and learning practice in both the BELP and ESTS case studies. The academic participants of the ESTS program were interested only in curriculum content, while participants within the BELP program recognised only the importance of improved learning and teaching practice when its use in research was identified.

It is essential for academic development programs to consider the ways in which academics in different disciplines develop their knowledge of teaching, learning, scholarship and research. Any academic development program should facilitate learning through the discipline’s base and draw on expertise from within the discipline. As such, programs should facilitate learning to the extent that academics begin to understand the scholarship of teaching within their discipline. The academic development programs examined here recognised the need to think about education and sustainability from a disciplinary perspective. However, intensive guidance is required if this is to be successfully achieved. BELP was the only program that worked closely with the academic participants to develop a group of committed individuals. However, this was unsuccessful in the long term because support was provided for only a finite period of time, and the groundswell diminished when the program ended. The experience of Forum for the Future was similar: the outcomes of the Curriculum Design Toolkit were limited because of the lack of discipline-specific guidance in its use and application. ESTS worked with a multidisciplinary group of participants, which provided the opportunity to share ideas from across disciplines and create a more holistic understanding of sustainability. However, the lack of support upon completion of the program meant that participants struggled to translate ideas to their own disciplines with the culture of their home institutions.

7.3 Organisational change in universities

Much of the work carried out by educational developers is based on the underlying assumption that equipping individuals with new skills and attitudes will eventually lead to improved practice and higher quality learning and teaching. Added to this
assumption is the belief that the newly equipped individual will be able to influence colleagues, and thus bring about further change in learning and teaching quality. The experiences from each of the case studies shows that more often than not this does not occur, with new-found enthusiasm eroded and old habits resurfacing on return to the department or school. There are numerous barriers to the adoption of new practice within higher education, and central to this is organisational culture. Altering the culture of the institution can occur only by changing underlying assumptions and institutional behaviours, processes and products. This must be deep, pervasive and intentional, affecting the whole institution over a long period of time (Eckel & Kezar 2002).

Sterling and Thomas (2006) argue that the inter-disciplinary nature of the sustainability paradigm means that curriculum for EfS cannot be developed by a central curriculum unit. They believe that curriculum for EfS must be developed from the issues and needs of the discipline/profession/course area. Curriculum must have sustainability principles embedded in it and then a context provided so that analysis, exploration and meaning can be generated. Sterling and Thomas (2006, p. 363) argue that

this implies that the only people who can achieve the development and delivery of EfS are, consequently, the academic teaching staff themselves. Nonetheless, it will be difficult for academics who have not been studying EfS to do all the work to develop a set of capabilities themselves, not least as it engages them in a role as learners as teachers.

The findings from this research concur with Sterling and Thomas (2006). It is only when academic development is situated within the culture of the organisation, and is seen to be driven from management that a change in practice and operations will result. The duration of the project and its structure will ultimately determine how deep and successful the change will be. The ESTS program was unable to effect change within the participants’ home institutions because the program did not consider organisational culture and its role in blocking and enabling change. Both BELP and Forum for the Future worked with staff directly within their organisations. However, the work of Forum for the Future was always perceived as being driven from outside (owing to their work with government and their success in informing higher education policy) and as a result they faced resentment from the UK academic community. BELP worked from within the organisation, but had limited success due to the short time frame of the project and limited resources (time and staff). The duration of
projects determines the ability of staff to achieve transformative change in their teaching practice/praxis. For double-loop learning to occur, action and reflection are needed, creating a culture of evolving practice.

7.4 **SEAD: Exploration of worldview in the development of pedagogical, instructional and curricular knowledge**

The literature review identified key overlapping principles that are central to sustainability education, academic development and organisational change, and these must be explored critically against one’s own worldview if transformational change in educational praxis is to occur. This is essential as our individual and collective worldview shapes our beliefs and practices (Fricker 1998; Robottom & Hart 1993). Understandings of sustainability and education, academic development and organisational change are founded in our worldviews and this must be recognised, critiqued and transformed into new ways of knowing across pedagogical, instructional and curricular knowledge. Specifically, some of the principles that must be included in any academic development program for sustainability education are:

- recognition of assumptions embedded into the thinking and practice within all disciplines
- recognition of the ethical consideration required in educational praxis
- discussion of the dominant scientific Western worldview.

Each case study recognised these three principles, but to varying degrees, and this is evident in the structure of each program, the approach to learning and teaching and curriculum development. The ‘lived’ experiences of those developing academic development programs determined the depth to which these three principles are embedded in such programs. Interestingly, common to all of the case studies was the fact that they were all constructed from an evidence base related to the individual’s own experience in the development and teaching of sustainability education programs for university students. The individuals/organisations drew on an evidence base informed by their own practice/praxis and this is reflected in the different approaches taken in each case study. This is inherently linked to their own understanding of the worldview and construction of knowledge as this translated into personal and professional practice/praxis.
7.5 Limitations of the study

This research is limited to three case studies focussed on creating change within formal education within the Higher Education sector. A more diverse range of programmes, including an analysis of informal community based sustainability education programmes, may have allowed for conclusions that could lead to more inclusive findings, and a greater understanding of what might constitute more successful approaches to academic development programs. There is no assumption being made that the findings here are representative of a larger sample. A larger selection of case studies may have yielded a stronger basis for generalising about conclusions. Especially, when considering the success of local educational initiatives in informal educational context. However, I have some confidence in the generality of the findings given their robustness across case studies, despite the diversity of approaches to academic development.

Additionally, there are no assumptions that participation within these programs will or has resulted in transformational change in educational praxis, by the participants within their area of activities or programs. A conscious choice to develop the SEAD framework as preliminary to the case study research was made. This framework is embedded with my assumptions and understanding of sustainability education. As a consequence this may have resulted in some level of bias with respect to the analysis of the case study findings and conclusions of the research.

7.6 Conclusion

The question of how to embed sustainability principles and capabilities in our education systems has become increasingly important over the past two decades as research and action for sustainability has gained momentum (Graham 2000). Universities in Australia and overseas are beginning to develop and incorporate sustainability into the curriculum as a result of growing concern for environmental protection, social justice and equity. However, to ensure we develop sustainability curricula that are holistic, multidisciplinary and contextually relevant, we need our academic institutions to go beyond merely reflecting the priorities of today’s society. Rather, graduates must be able to educate others to think innovatively and creatively and to have the ability to embed their own set of values in their professional practice.
Sustainability education requires students to develop meta-skills such as the ability to think critically about the nature of knowledge and about the ways in which knowledge is produced and validated. Skills and capabilities specific to each profession are also required. Educating for these new skills will require shifts in educational practice, pedagogy and the development of new curriculum. Academic development programs are needed to assist educators to develop sustainability educational praxis. This is where educators are aware of their disciplinary assumptions and traditions and recognise the priorities and values that are played out in the classroom (through the construction of curriculum, learning and teaching methods and the pedagogy that consciously informs this) that in turn influence their own and their students’ personal and professional practice.

There are many, varied approaches to sustainability education, all of which may have validity, depending on which teaching tradition the educator comes from and what their standpoint on sustainable development is (Dawe, Jucker & Martin 2005). However, a common theme is that sustainability education requires educators to reflect on their own understanding of sustainability and their own pedagogy and educational methods. This is problematic as many academics do not have an educational theory background (Sterling & Scott 2008) and find the idea of different approaches to learning and teaching founded on values and ethics confronting. Additionally, reflecting on one’s own worldview to determine how this informs teaching style and the development of pedagogy and curriculum requires flexible approaches to definitions of sustainability, which have previously been approached from an instructive and prescriptive model rather than in an encouraging and collaborative manner.

To improve their learning and teaching practice, educators need to consider themselves as active learners who recognise how they construct their own understanding of knowledge. This is especially important for those engaging in sustainability education, given that the sustainability paradigm is contested and open to epistemological interpretations (McAlpine & Weston 2000; Putnam & Borko 2000). Chappell (2007) argues that reflection is an essential ingredient of the learning process and that unless lecturers engage in critical reflection and ongoing discovery, they stay trapped in unexamined judgments, interpretations, assumptions and expectations. According to Barnett (1992), reflective practice enables lecturers to compare their teaching to their own experiences highlighting differences between
theory and practice, with the reflective process becoming a means of re-conceptualisation. However, as argued by Chappell (2007), the role of reflection in improving educational pedagogy has been devalued in recent years. Sustainability education needs to openly challenge the learner and encourage discussion about the complexity of our environmental, social and economic systems rather than discussing content in isolated simplistic terms, so that the learning experiences are participatory and respectful of the different perspectives of others. Unless deep learning is facilitated and supported, sustainability education will result in shallow learning and no change in practice.

Universities are characterised by both their collective and individual values, beliefs and structures. Academic and disciplinary modes of identity are arguably the constituent elements of scholarly cultures. These cultures are maintained, perpetuated and enforced by the communities which develop within the disciplines and departments of a university. Consequently, when thinking about notions of changing practice we need to think about how practice is constructed, and recognise that it is highly situated (Kemmis 2008a, 2008b). The development of curriculum, pedagogy and educational method are all heavily influenced by the social and cultural character of the teaching institution and discipline area, and these factors can impede change (Chappell 2007). Consequently, academic development is best situated within the discipline undergoing change and led by educators who are respected for their learning and teaching practice within that discipline. Learning that takes place must include pedagogical content knowledge, the capacity to represent a subject in ways that transcend the split between intellectual substance and teaching process (Boyer 1990). Additionally, those developing and delivering academic development programs must also continually develop their own pedagogy in light of their experience. As pedagogical, institutional and curricular knowledge is informed by one’s own definition and understanding of sustainability/sustainable development, failure to engage with these issues continually can limit the scope and success of academic development.

For change to occur within higher education, the academic self and the academic community need to be considered. Organisational change must be led from both the ‘top down’ and ‘bottom up’, and drivers of change must be identified and supported. Support is needed from senior management to establish a collaborative style, and demonstrate openness and a willingness to listen. It is also important to ensure the
culture of the organisation is steered in the direction to support such changes, through initiatives that recognise and reward. However, simply changing structures, policies, and reward systems will not achieve change in educational praxis. Institutional changes also rely on outsiders to play important roles. External leadership is required from organisations that can influence curriculum and graduate outcomes in line with sustainability principles.

Change must also be supported from the bottom up; this requires empowered individuals and groups within organisations and can be guided by leadership at all levels where there are connections between people who share a concern, a problem or a passion and who want to deepen their knowledge and expertise in this area by interacting on an ongoing basis. Intensive and personalised support must be provided – time, resources and space that allows for employees to reflect, think systemically and shift to new mental models. Toolkits provided without facilitation will not be adopted.

A significant transformation is required for universities to meet the challenge of sustainability education. Yet the theoretical and practical foundations required are still in their infancy, and holistic models of sustainability education are yet to be developed. The need for understanding change in universities – both curriculum change and organisational change – is paramount if sustainability education is to be successful. I hope that the framework for academic development programs developed in this thesis will provide guidance to those wishing to begin the journey.
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Appendices

Appendix A  Case Study Semi-structured Interview Questions

Organisational Structure and Operations
What are the priorities of your institution?
What are the major operations of the organisation?
Could you please give a sense of the program/project that you have been involved in?
  What are its aims and how are they implemented?
  How many people work in this program/project?
  How is it funded?
How is the project/program organised?
Does your organizational mission/values statement support the objective of your program/project?

Education and Sustainable Development/Sustainability
How do you define sustainable development/sustainability?
How do you define education for sustainable development/sustainability?
Do you believe that educators need certain knowledge to teach sustainable development/ sustainability?
How important is it for sustainable development/sustainability capabilities to be built into university curriculum?
What are the skills you believe educators need to be able to teach sustainable development capabilities?
Do you believe that education for sustainable development/sustainability should be taught in tertiary Institutions as a single subject or integrated into existing curricula?
Do you believe we need to educate current teaching academics about education for sustainable development/sustainability? Why/Why not?
Do you believe that ethics are a relevant part of education for sustainable development/sustainability?
Sustainability Education Program/Course

Student/Participants' learning environment
How is the learning program structured?
What do participants learn in the course/program?
What are the learning goals for the course/program?
What learning outcomes are achieved by participants? Are these measured and if so how?
Are students/participants clear about what they are required to achieve/learn in the course?
Do participants stay in contact with you after they have experienced the learning program to discuss the course or their learning? What type of feedback do they receive?
What is the participants’ physical environment like? Is there a reason for this structure?
What is the students'/participants’ social environment? Does this affect their ability to implement what they have learned during the course/program? How do you think this could be overcome?
Do participants have access to appropriate resources to implement what they have learnt in their own institutions? How do you think this could be overcome?
How much do the students/participants participate/engage in the course?

Students'/Participants' learning strategies
What types of learning strategies does the course require students/participants to use?
How motivated and interested are students/participants in the course?
How much time and effort do students/participants put into learning for the course?
How self-directed or self-regulated (ie set goals, manage time and effort, plan their learning, monitor progress, adapt strategies as required, evaluate performance, persist in the face of difficulties, seek help when they need it) are students/participants in the course?
To what extent is the course structured so that students link what they are learning to their own teaching/disciplinary practice?

Students'/Participants' reactions to program/course
How confident are students/participants about learning in the course?
What reactions do students/participants express when attending classes /when applying the knowledge from the course/program?

**Learning barriers**

What are the barriers you have encountered to engaging participants in the topic of sustainability and education? Have you developed techniques to overcoming these? In your experience, what are the key barriers to the adoption of sustainability/EfSD education by participants of your program? What elements/structures need to be in place to enable uptake?

**Overall**

What in your opinion are the most important factors contributing to a student's/participants positive learning experience?
Appendix B  Case Study Survey Questions

YES Alumni Survey

This survey uses a five point Likert scale and some open ended questions and should take approximately 20 minutes to complete. Please answer the open ended questions as honestly and in as much detail as you feel appropriate. The Likert scale question require you to indicate your degree of agreement with the statements provided from Strongly agree to strongly disagree.

1. In what year did you attend the YES program?
   - July 2000
   - August 2000
   - July 2001
   - August 2001
   - July 2002
   - August 2002
   - July 2003
   - August 2003
   - July 2004
   - August 2004
   - July 2005

2. What is your disciplinary background?
___________________________________________________________________
___________________________________________________________________

3. What geographical region are you from?
   - Europe/+UK
   - North America
   - Asia Pacific
   - Africa
   - Central/South America

4   □ Male   □ Female

5. What elements of the program had the greatest impact on you? (Please select as many as you feel appropriate)
   - The academic program i.e. lectures and content
   - The social/personal aspect of the program
   - The multicultural aspect of the program
   - The multidisciplinary aspect of the program
The location of the program

If yes any/all of these please explain why?

___________________________________________________________________
___________________________________________________________________

6. What is the most significant memory you have from the YES Experience?

___________________________________________________________________
___________________________________________________________________

7. The learning goals for the course/program were made clear to you.

1 __ __ __ __ __ 5

Very clear        Don’t Know        Not clear

Please provide reasons?

___________________________________________________________________
___________________________________________________________________

8. I believe I achieved my learning goals

1 __ __ __ __ __ 5

Achieved        Don’t Know        Did not achieve

Please provide reasons?

___________________________________________________________________
___________________________________________________________________

9. What in your opinion what were the most important factors that contributed to the learning experience?

___________________________________________________________________
___________________________________________________________________

10. Did you enjoy the structure of the learning program (lectures, field trips etc)?

Yes   No   Why/Why not? (please provide reasons)

___________________________________________________________________
___________________________________________________________________
11. Which of the following adjectives describe your memories of the program? Please circle?

- Happiness
- Boredom
- Pride
- Frustration
- Anxiety
- Understanding
- Anger
- Enjoyment
- Confusion
- Satisfaction
- Other________________________

12. The program has assisted you in changing your approach to personal practice/decisions/employment choices.

1 __  __  __  __  __  5
Greatly assisted  Don’t Know  No assistance

Why/Why not?
_________________________________________________________________
_________________________________________________________________

13. I was highly motivated and interested in pursuing sustainability within my personal and professional practice as a result of your participation in the course.

1 __  __  __  __  __  5
Strongly agree  Don’t Know  Strongly disagree

Please provide reasons.
_________________________________________________________________
_________________________________________________________________

14. The YES program has assisted in changing your approach to your studies and/future career path.

1 __  __  __  __  __  5
Strongly agree  Don’t Know  Strongly disagree

What is your job today? What is your future career path?
_________________________________________________________________
_________________________________________________________________
15. I would recommend the YES program to others wishing to experience a similar program on.

1 __  __  __  __  __ 5
Strongly agree    Don’t Know    Strongly disagree
Why/Why not? (Please provide reasons)
___________________________________________________________________
___________________________________________________________________

16. How do you define Sustainability/Sustainable Development?
___________________________________________________________________
___________________________________________________________________

17. Did the YES program inform your definition of Sustainable Development?
   Yes  No
If Yes how?
___________________________________________________________________
___________________________________________________________________

18. Has anything else contributed to changing your definition of sustainable development since?
   Yes  No Please explain?
___________________________________________________________________
___________________________________________________________________

19. I believe that environment & social ethics (e.g. inter and intragenerational equity, social justice, ecosystems services) are a part of Education for Sustainable Development.

1 __  __  __  __  __ 5
Strongly agree    Don’t Know    Strongly disagree
Please provide reasons
___________________________________________________________________
___________________________________________________________________
20. I believe that Education for Sustainable Development should be a part of all students learning experiences.

1 __ __ __ __ __ 5
Strongly agree Don’t Know Strongly disagree
Please provide reasons

21. I have you experienced any resistance to the adoption of material that you have generated as a result of this program within my social environment like i.e. interaction with one another and with staff (learning institution/employee).

1 __ __ __ __ __ 5
Strongly agree Don’t Know Strongly disagree
Please Explain and/or provide examples?

22. If you experienced resistance how do you think this could be overcome? (please provide examples)

___________________________________________________________________
___________________________________________________________________

23. Have you participated in the activities and been apart of the alumni program?
Yes □ No □

The YES program has assisted you to implement the learning outcomes of this course on a scale from 1 (greatly assisted) to 5 (no assistance)?

1 __ __ __ __ __ 5
Strongly agree Don’t Know Strongly disagree
Why/Why not? (please provide reasons)

___________________________________________________________________
24. How effective has the YES course been compared to other short course you have attended in terms of improving my knowledge and generating action?

___________________________________________________________________
___________________________________________________________________

25. Do you have access to appropriate resources to implement the learning outcomes of the program in your personal and professional life? Yes  No
Why/Why not? (Please provide reasons) How do you think this could be over come?

___________________________________________________________________
___________________________________________________________________

26. Do you see this program/course as contributing to the wider community and disciplinary/professional practice?  How? Please provide examples?

___________________________________________________________________
___________________________________________________________________
YES August 2006 Survey Questions

1. Why did you apply for the YES program?
___________________________________________________________________
___________________________________________________________________

2. How did you hear about the YES program? (Please circle)

Website  Friends  YES Alumni  University  University Professor

Other
___________________________________________________________________
___________________________________________________________________

3. What is your disciplinary background?
___________________________________________________________________
___________________________________________________________________

4. What were expectations of the YES programs before you arrived?
___________________________________________________________________
___________________________________________________________________

5. Where your expectations meet on a scale from 1 (the program met all my expectations) to 5 (the program didn’t meet any of my expectations)?

   1 __  __  __  __  __  5

   Met all expectations  Did not meet my expectations

   Why/Why not? (Please provide reasons)
___________________________________________________________________
___________________________________________________________________

6. How do you define Sustainability/Sustainable Development?
___________________________________________________________________
___________________________________________________________________
7. Has this definition changed as a result of your experience within the YES program?

Yes  No  if yes how has this definition changed?

___________________________________________________________________
___________________________________________________________________

8. Which of the modules did you find most interesting and useful in thinking through sustainable development as a concept? (please tick relevant box)

- Module 1: The sustainability concept: Introduction and basic understanding
- Module 2: Basic systems: natural systems/human systems
- Module 3: Physical Needs
  - 3.1: Energy & Materials
  - 3.2: Nutrition & Health
  - 3.3: Living Space
- Module 4: Psychosocial needs

Please provide reasons for your choices.

___________________________________________________________________
___________________________________________________________________

9. What elements of the program had the greatest impact?

- The academic program i.e. lectures and content
- The social/personal aspect of the program
- The multicultural aspect of the program
- The multidisciplinary aspect of the program
- The location of the program

If yes any/all of these please explain why?

___________________________________________________________________
___________________________________________________________________
10. How did the artistic elements of the program with Klaus add to your experience in the program?
___________________________________________________________________
___________________________________________________________________

11. How relevant to the program content were the field trips (i.e. visit to Glarus/Cheese making farm)?
___________________________________________________________________
___________________________________________________________________

12. Did you enjoy the delivery of the learning program (this means lectures, materials, field trips, cultural night etc)?
Yes  No  Please specify elements you enjoyed most and why.
___________________________________________________________________
___________________________________________________________________

13. What did you find valuable about the group work? What would you change and how?
___________________________________________________________________
___________________________________________________________________

14. Were the learning goals for the course/program made clear to you on a scale from 1 (very clear) to 5 (Not clear)?

1 __ __ __ __ __ 5
Very clear  Not clear
Please provide reasons?
___________________________________________________________________
___________________________________________________________________
15. Do you believe you achieved these on a scale from 1(Achieved) to 5 (Not achieved)?

1 __  __  __  __  __  5
Achieved Not achieved
Please provide reasons?
___________________________________________________________________
___________________________________________________________________

16. How motivated and interested were you in the course from a scale of 1(highly motivated) to 5 (highly unmotivated)?

1 __  __  __  __  __  5
Highly motivated Highly unmotivated
Please provide reasons.
___________________________________________________________________
___________________________________________________________________

17. To what extent is the course structure and content relevant to your own learning/disciplinary practice on a scale of 1(Very relevant) to 5(Very irrelevant)?

1 __  __  __  __  __  5
Very relevant Very irrelevant
Please Explain?
___________________________________________________________________
___________________________________________________________________

18. How satisfied were you with the program in terms of understanding Sustainable Development from a scale of 1(highly satisfying) to 5 (highly unsatisfying)?

1 __  __  __  __  __  5
Highly satisfying Highly unsatisfying

19. Can you suggest any alterations to the program to improve the learning experience?
___________________________________________________________________
___________________________________________________________________
20. Which of the following adjectives describe your reactions during this program?
Please circle?

□ Happiness  □ Boredom  □ Pride  □ Frustration
□ Anxiety  □ Understanding  □ Anger  □ Enjoyment
□ Confusion  □ Satisfaction

Other_______________________________________________________________

21. What in your opinion are the most important factors that contribute to a learning experience?
___________________________________________________________________
___________________________________________________________________

22. Will this program assisted you in changing your approach to your studies and/ future career path on a scale from 1(greatly assisted) to 5 (no assistance)?

1 __  __  __  __  __ 5
Greatly assisted  No assistance

Why/Why not?
___________________________________________________________________
___________________________________________________________________

23. Would you recommend the YES program to others wishing to experience a similar program on a scale from 1(strongly recommend) to 5 (would not recommend)?

1 __  __  __  __  __ 5
Strongly Recommend  Would not Recommend

Why/Why not? (Please provide reasons)
___________________________________________________________________
___________________________________________________________________
24. Do you believe education programs on sustainability are important for all students to experience?

1 __ __ __ __ __ 5
Most Useful Least Useful
Why/Why not? (please provide reasons)
___________________________________________________________________
___________________________________________________________________

25. Do you see this program/course as contributing to the wider community and disciplinary/professional practice? How? Please provide examples?
___________________________________________________________________
___________________________________________________________________

25. General Comments-
___________________________________________________________________
___________________________________________________________________
YES Educator Seminar: Survey Questions

This survey uses a five point Likert scale and some open ended questions and should take approximately 20 minutes to complete. Please answer the open ended questions as honestly and in as much detail as you feel appropriate. The Likert scale question require you to indicate your degree of agreement with the statements provided from Strongly agree to strongly disagree.

Demographics

Q 1. Which area of the University do you work in? (Please tick the box)
- □ Teaching/Research
- □ Administration
- □ Management
- □ Services (property)

Q 2. What discipline area do you teach/work in?
___________________________________________________________________
___________________________________________________________________

Q 3. What geographical region are you from?
- □ Europe/+UK
- □ North America
- □ Asia Pacific
- □ Africa
- □ Central/South America

Q 4
- □ Male
- □ Female

Education for Sustainable Development

Q 5. Sustainable Development skills/capabilities should be built into all university curricula.

1 __  __  __  __  __ 5
Strongly agree        Don’t Know        Strongly disagree
Q6. Do you believe that educators need certain knowledge to teach education for sustainable development? Yes  No
If yes what are these?
___________________________________________________________________
___________________________________________________________________

Q7. Do you believe that educators need certain skills/capabilities to teach education for sustainable development? Yes  No
If yes what are these?
___________________________________________________________________
___________________________________________________________________

Q8. I believe that environment & social ethics (e.g. inter and intergenerational equity, social justice, ecosystems services) should be a part of Education for Sustainable Development.

1 __  __  __  __  __ 5
Strongly agree  Don’t Know  Strongly disagree

Please provide reasons
___________________________________________________________________
___________________________________________________________________

Q9. I believe that Education for Sustainable Development should be taught in tertiary Institutions as a single subject.

1 __  __  __  __  __ 5
Strongly agree  Don’t Know  Strongly disagree

Please provide reasons
___________________________________________________________________
___________________________________________________________________
Q10. I believe that Education for Sustainable Development should be taught in tertiary Institutions integrated into existing curricula.

1 __  __  __  __  __ 5
Strongly agree  Don't Know  Strongly disagree
Please provide reasons

___________________________________________________________________
___________________________________________________________________

Q11. How do you define Sustainability/Sustainable Development?

___________________________________________________________________
___________________________________________________________________

Q12. How do you define Education for Sustainable Development?

___________________________________________________________________
___________________________________________________________________

YES Education for Sustainable Development Program/Course Experience
(Please answer these questions based in your experience of the YES Educators seminar held in 2005)

Q13. Did you enjoy the structure of the learning program i.e. intensive nature, out of your home institution, multidisciplinary, multicultural? Yes  No  Why/Why not?
Please provide reasons.

___________________________________________________________________
___________________________________________________________________

Q14. The learning goals for the course/program were made clear to you.

1 __  __  __  __  __ 5
Strongly agree  Don't Know  Strongly disagree
Please provide reasons?

___________________________________________________________________
___________________________________________________________________
Q15. The learning outcomes made clear to you.

1 __  __  __  __  __  5
Strongly agree       Don't Know  Strongly disagree
Please provide reasons?

___________________________________________________________________
___________________________________________________________________

Q16. I believe you achieved these.

1 __  __  __  __  __  5
Strongly agree       Don't Know  Strongly disagree
Please provide reasons.

___________________________________________________________________
___________________________________________________________________

Q17. I was motivated and interested in the course.

1 __  __  __  __  __  5
Strongly agree       Don't Know  Strongly disagree
Please provide reasons.

___________________________________________________________________
___________________________________________________________________

Q18. The course structure and content was relevant to my own teaching/learning/disciplinary practice.

1 __  __  __  __  __  5
Strongly agree       Don't Know  Strongly disagree
Please Explain?

___________________________________________________________________
___________________________________________________________________

Q19. I was satisfied with the program in terms of providing me with the skills and ability to build sustainable development concepts into my curriculum/research professional practice.

1 __  __  __  __  __  5
Strongly agree       Don't Know  Strongly disagree
Q20. Can you suggest any alterations to the program to improve the learning experience?

___________________________________________________________________
___________________________________________________________________

Q21. Which of the following adjectives describe your reactions during this program? Please circle?

Happiness  boredom  pride  frustration
Anxiety  understanding  anger  enjoyment
Confusion  satisfaction
Other_______________________________________________________________

**Overall**

Q22. What in your opinion what are the most important factors that contribute to a learning experience of this nature?

___________________________________________________________________
___________________________________________________________________

Q23. The program has enabled/assisted me in changing my approach to curriculum development and your teaching practice/professional practice.

1 __  __  __  __  __  5
Strongly agree       Don't Know       Strongly disagree

Q24. I have you experienced any resistance to the adoption of material that you have generated as a result of this program within your social environment like i.e. interaction with one another and with staff (teaching, support and admin).

1 __  __  __  __  __  5
Strongly agree       Don't Know       Strongly disagree

Please Explain and/or provide examples?

___________________________________________________________________
___________________________________________________________________
Q25. If you experienced resistance how do you think this could be overcome? (please provide examples)

___________________________________________________________________

___________________________________________________________________

Q26. Support from the YES program team would assist me to implement the learning outcomes of this course.

1 __  __  __  __  __  5  
Strongly agree     Don’t Know     Strongly disagree

Why/Why not? (please provide reasons)

___________________________________________________________________

___________________________________________________________________

Q27. Do you have access to appropriate resources to implement the learning outcomes of the program in your own institution/social environment?

Yes    No    Why/Why not? (Please provide reasons) How do you think this could be overcome?

___________________________________________________________________

___________________________________________________________________

Q28. My experience of the YES program have allowed me to have influence my social environment/Tertiary Institution.

1 __  __  __  __  __  5  
Strongly agree     Don’t Know     Strongly disagree

Why/Why not? (please provide reasons)

___________________________________________________________________

___________________________________________________________________

Q29. I would you recommend the program to others wanting guidance/supporting in understanding and developing curriculum which includes concepts of sustainable development.

1 __  __  __  __  __  5  
Strongly agree     Don’t Know     Strongly disagree
Why/Why not? (Please provide reasons)

___________________________________________________________________
___________________________________________________________________

Q30. Do you see this program/course as contributing to the wider community and disciplinary/professional practice? How? Please provide examples?

___________________________________________________________________
___________________________________________________________________
Appendix C  Documents used in documentary analysis

Ch 4 Beyond Leather Patches Sustainability Education project, RMIT University, Australia


Ch 5: Youth Encounter on Sustainability and Educators Semina on Teaching Sustainability, ETHsustainability, Zurich
Baud, R 2004, YES – Student Education in Sustainability Public Education in a Knowledge Society: Creativity, Content, and Delivery Mechanisms”, Delhi
Sustainable Development Summit, New Delhi, 1 February 2004.


ETHsustainability 2005c, *Youth Encounter on Sustainability (YES) Braunwald 2005 Summary report*, ETHsustainability, Zurich.

Grant, M 2009, ‘Internationalising education for sustainability – the Youth Encounter on Sustainability (YES)’, in P Corcoran & Osano (eds), *Young people, education and sustainable development: Exploring principles, perspectives, and praxis*, Wageningen Academic Publishers, Wageningen The Netherlands


**Ch6: Forum for the Future: Education and Learning, London**


Appendix D: Summary of the semi-structured interviews with the BELP project team

Aim and project structure

- To create long-lasting change in the way sustainability is taught across courses and modules within subject discipline(s) in a school.
- The process included a top-down as well as a bottom-up approach and required ‘buy in’ from academics as well as the head of school.
- The BELP project aimed to use a sample of program teams to design and implement a model that establishes greenhouse issues into their curricula, under the broad framework of sustainability concepts, analysis and outcomes. The process involved engaging a champion from participating Schools, running workshops to stimulate interest amongst staff and supporting the champion to develop new and/or revised teaching material with other staff within the School.
- The champion needed to build links with individuals across the school in order to successfully engage with staff and achieve the project goals. Their role was important in terms of building relationships across the school, and creating a sense of community and sense of validation. This does not really exist within any of the schools across RMIT, and is difficult to build. A project like this builds a very solid commitment to a place, and to the student.
- The structure work really well but not without the support from the project officer. Support from the project officer was just as important as the management support because it completes the project. Having a champion without colleague support and validation would leave them isolated and unable to have any real influence. For long term change support around the champion must be built by those around them.
- The model was excellent the problem was the personalities and the authority held by the project team to lead and be clear about the strategic direction

Barriers to the implementation of the project

- There was limited interest from academics within the school, making it very hard to engage initially. As time went on and with the support of a new head of school, other academics attended a workshop and paid lip service to the project. However they were not prepared to spend the time to identify changes
that could be made within their courses unless these changes required minimum effort. The approach was not successful as it requires buy-in from individuals; no buy-in, no results. If more than one person had taken the project on-board there may still be interest. Because the ongoing project co-ordination has been handed over to someone within the school with no interest in the project, nothing more will happen.

- How the champion interacted with the staff influence the extent of the project.
- Unfriendly, uninterested colleagues and time constraints were the principle obstacles. Opportunities were created as I was given the autonomy to design courses in a way that could have a positive impact on student experience.
- Academics tend to work in isolation and are quick to deflect responsibility. If they don’t buy-in to the project immediately, they are very unlikely to buy-in at a later date, unless it may help them gain a promotion/favour within the school. If academics drove innovation rather than waiting for innovation to bite back from industry there would be a huge interest within the school, but the lack of research appears to stifle innovation which in turn impacts on what is taught – i.e. not the new paradigm but the status quo!
- One of the problems was that the academic champion was on contract and didn’t spend a lot of time in the office and therefore didn’t perhaps have the ability to influence other staff therefore was significantly reduced.
- The culture of the school is very much about maintaining the status quo of just about everything.
- Obstacles to achieving change included tenure of staff involved (both champions have taken jobs in other universities), lack of tangible support from senior university management and lack of opportunity to include new or revised courses in the structure curriculum of participating programs. Another important obstacle stems from the fact that we were asking participants to question the foundations of their discipline and there is clearly some tension in the very nature of some programs and sustainability. The value of sustainability education as an ‘add-on’ to an otherwise conflicting program is questionable.
- Portfolio has pulled back from sustainability as a research theme.
- It had limited impact because I think that these things take time and you just have to keep plugging over time.

Success of project in initiating and driving change within the School.
• “I don’t think the project resulted in creating change within the school; but it did provide a focus for academics to start thinking in terms of sustainability.”

• The style of engagement of the two participating Schools was substantially different, partly due to the relationship between the champions and the Heads of School and other staff. “The project depended on the champion being able to present the case convincingly to staff within the School, which for some reason was made difficult if they are perceived as an ‘outsider’ or a temporary/sessional staff member.”

• Prescriptive approaches sensitive to the needs of specific disciplines is essential for curriculum change programs to be a success. “It seemed to me that one-on-one interaction with staff members was an important step to achieving buy-in, but this is very time consuming. A clear need for staff training in sustainability was identified; many staff members had a shallow understanding of the issues and found it difficult to understand the relevance of sustainability to their discipline beyond a superficial treatment.”

• Indirect and possibly more long-lasting change was created through shifts in the attitudes and interest of participants

• The academic champion became our hub for sustainability in the school in both the research and the teaching that gathered other people even though they’re where some challenges around that.

• Reflecting now probably not I think if we had another year that would have really bedded down those things and really strengthen the team that could have progressed things a lot more. In a way we have now lost momentum

• “The staff within the school now value teaching and learning not necessarily sustainability. The other interesting outcome is that people within the schools watched the academic champion grow and develop from someone initially in a marginalised position to someone recognised for their approach to teaching, funded research and is now very engaged across the university. In that way it created a model of behaviour and empowering model that you don’t get otherwise.”

• The teaching and research as a combined model was very confronting but it was an area of development that was empowering and inspiring to others giving them a lot of encouraging. It was really good, it hasn’t all been good but you can see some good as a consequence.
Appendix E: Property Construction and Project Management

Student survey questions and responses

RMIT Student satisfaction survey questions
Responses to the following closed questions were analysed:
1. This course contributes to my confidence in tackling unfamiliar problems;
2. Assessment tasks in this course require me to demonstrate what I am learning;
3. There is a good balance between theory and practice;
4. I can see how I'll be able to use what I am learning in the course in my career;
   and
5. Overall I am satisfied with the quality of the course.

The responses to two open ended questions were also analysed:
1. What were the best aspects of the course; and
2. What aspects of this course are in most need of improvement?

Student Response
BUIL 1217 Research and Sustainability
Student commented that the course helped them to understand sustainability concepts, raised the importance of environmental issues and assisted them in learning new approaches to building/construction and sustainability from both a personal and professional content. 28% of participants strongly agreed and 40% agreed that overall they were satisfied with the quality of the course. 26% did not know and 6% disagreed. However, some students commented that there was too much expected knowledge, and there needed to be a briefer introduction into topics. Students also found the logistics of the course difficult citing that three lectures were to long and class sizes were to large to maximise the learning process.

Student felt the guest speakers, group work, footprint activity and site visits added to the learning experience both assisting with the understanding of theory and practice but also enabling them to problem solve. 14% of students strongly agreed that the course contributed to their confidence in tackling unfamiliar problems 44% agreed, 32% did not know if it had while 5% disagreed. While 12% of student strongly agreed
and 36% agreed that there is a good balance between theory and practice. While 42% responded that they didn’t know and 10% disagreed.

18% of student strongly agreed that the assessment tasks in this course require them to demonstrate what they had learnt, 52% agreed, 22% responded that they did not know 6% disagreed and 2% strongly disagreed. Students sited the style of assessment as adding to the assessment experience and visiting the sites that you were required to undertake assignments on as beneficial. However, others were uncomfortable with the group process and simply working in groups.

34% of students strongly agreed and 42% agreed that they saw how they would be able to use what they learnt in the course in their career, 10% responded that they did not know and 4% disagreed. Students comment that there was a good link between content and application with real world practice and that they understood the importance of the construction industry to the future. However, others commented that more site visits would have added to their understanding of the link between theory and practice and that more on commercial buildings would have been good.

**BUIL 1161 Sustainability Study Tour**

Strongly agree 4 (22%) of students strongly agreed that the course contributed to their confidence in tackling unfamiliar problems 28% agreed while 39% did not know and 1% disagreed. The active learning element and the sense of responsibility and self motivation enabled student to develop confidence in their own ability especially as it related to new information and approaches to assessment.

42% strongly agreed 24% agreed 17% didn’t know and 17% disagreed that the assessment tasks in the course require them to demonstrate what they learnt. Students commented that they were uncomfortable with being assigned a group and having to rely on other group member. There main concerns were that group work does not reflect the work of the individual

39% of students strongly agreed and 33% agreed that there was a good balance between theory and practice, while 11% didn’t know and 11% disagreed.
48% strongly agreed and 24% agreed that they can see how they will be able to use what they are learning in the course in their career. 16% commented that they didn’t know and 12% disagreed.

22% strongly agreed and 45% agree that overall they were satisfied with the quality of the course 22% commented that they didn’t know and 11% disagreed. Travelling overseas and living with their peers allowed students to not only learn from the course but also from each other. The spare time allowed students to think and discuss with each other the concepts that had been presented to them throughout the day.
Appendix F: BELP Flexible Change Framework

Development of Project Team
The curriculum renewal program should focus within academic schools with a core support team and identified academics from within the schools to facilitate a process tailored to the discipline area. The core team members should include an academic reference team, project coordinator, participating academics and academic coordinators.

Academic Reference Team
Identification and appointment of academics who have previous experience and understandings of

Project Coordinator
Manages the project
Provides support to the participating Schools to promote understanding of sustainability and innovative educational/pedagogical approaches.

Participating Schools
The selection of schools based on their understanding, sympathy and previous experience in attempting to integrate concepts of sustainability into their curriculum.
Upper management support is important, so the ‘Head of School’ needs to be supportive and seen to be actively involved.

Academic Champions
Academic champions should be engaged to ensure that staff within each of the schools feel supported, engaged and empowered.
Academic champions facilitate activities within the schools, providing opportunities for academic staff to precipitate change drawing on their cultural understanding of operations, curriculum development and understanding of sustainability from a disciplinary perspective.
Sustainability Course Audit

The role of the course audits is to:

- Identify courses containing material focusing on sustainability;
- Identify opportunities and barriers to embedding sustainability capabilities and concepts into current teaching practice within specific academic schools;
- Identify staff attitudes to the sustainability education.

This information allows the project team to develop a curriculum renewal process that is contextually relevant and fits within the culture of the school.

Development of Course Audit

The project coordinator and the academic champion should develop the sustainability course audit. The audit should be structured in a way that demonstrates to the participant the variety of sustainability-related topics that could potentially be taught. The audit also provides opportunities for the identification of barriers, opportunities, and assistance that the participants need if it is to be successful.

Dissemination Results of Course Audit

The academic champion should disseminate results of the sustainability course audit so that participants associate the project as sitting within their academic school and guided by a fellow colleague.

Action Learning Workshops

Action learning workshops assist in the development of a broad understanding of education for sustainability, specifically how it fits into programs and courses and strategies for implementing (developing new curriculum) within the academic schools as determined by the teaching academics themselves. The workshops should be developed based on audit results, and run to engage and encourage staff to include education for sustainability into existing content, and the development of new courses where relevant. The workshops should be structured to provide academics with the opportunity to critically reflect on what sustainability means to them in both their professional and personal practice, while exploring how the sustainability paradigm sits best within their subject material. The workshop structure recognises the importance of reducing barriers to the adoption of sustainability into course curricula by developing a culture of collaboration across the school, and providing a safe and open forum for real discussion to be had about this complex and often contested paradigm.

To set up a process for those interested/inspired to continue meeting to discuss and work on renewal/review process (development of a community of practice).
Action learning through action research

Action learning groups should be established within each school to review generic and school specific findings from the course audits, and potential curriculum renewal opportunities identified in the workshop. The group work should be facilitated by the academic champion with the assistance of the project co-ordinator. Individuals and small teams of academics within the school explore ways of enhancing the adoption and integration of education for sustainability into the schools’ programs and courses.

Curriculum Renewal and Course Development

Education for sustainability is a challenge for educators as the material is complex and requires new ways of thinking and presenting. The curriculum renewal program must assist academics in developing their own holistic understanding of sustainability, where it can be defined within the context of the discipline, understood in relation to the limitations and opportunities presented in societal practice, and taught in a way that is progressive. New innovative instructional strategies and techniques need to be collaboratively researched in order to institutionalise new pedagogical approaches.

Curriculum can be developed in two ways; as stand alone courses, or as modules to sit within existing courses.

1. Stand Alone Sustainability Courses

Stand-alone courses are developed to add sustainability concepts as they relate to the discipline into the curriculum. These courses provide students with the theoretical understandings of the many practical solutions to sustainability within the context of their discipline.

Ideally they should make links to other courses in the program and to represent a building block for the ultimate integration of education for sustainability throughout the program. Student learning within these courses could/should focus on current and potential professional values and practices within the context of a sustainable future. For example, content can be structured so that all students at some point within their studies understand:

A. How their discipline area and professional practice functions and affects the natural environment and its contribution to a sustainable economy.
B. How their discipline area and professional practice builds social capacity
C. The basic values and core assumptions present in the content and methods of their academic discipline.

2. Education for Sustainability Modules

Education for sustainability modules are components of the overall course (perhaps up to ¼ of the class time with/without related assessment) that introduces sustainability into the curriculum as it relates to the particular course.

This approach involves developing basic sustainability modules within existing courses. Modules can be made up of resource materials, notes for faculty to guide integration of the resource into the program, an outline of learning objectives, and examples of assessment tasks.

(Holdsworth et al. 2009)
The following check list was developed to support the implementation of the flexible change framework. The checklist has been divided into three phases: Project Development, Engagement, and Action and outlines the elements that are crucial to the success of an education for sustainability curriculum renewal project based on the findings and experiences of the BELP project. These points do not need to be strictly adhered to, but they have been recognised as critical elements to consider and should be used as a guide to inform project development and operation (Holdsworth et al. 2009).

### Education for Sustainability Curriculum Renewal Project Checklist

<table>
<thead>
<tr>
<th>Phase: Project Development</th>
<th>Phase: Engagement</th>
<th>Phase: Action (Development of Curriculum Material)</th>
</tr>
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<tbody>
<tr>
<td>• The project has the ability to attract critical resources</td>
<td>• There is a wide level of engagement and participation across a broad cross section of the participating school, and across the university others are able to offer support, advice and information. • There is a high level of academic credibility. • The project challenges educators to think critically about the pedagogical issues associated with education for sustainability in relation to their disciplines. • The project allows educators to deliberate and reflect on alternative solutions, and finally justify instructional decisions in a supported and empowered environment. • Time is allocated for the academic champions and the project coordinator to develop material in a collaborative approach so that disciplinary content and sustainability content evolve into education for</td>
<td>• Curriculum development needs to be owned and driven by the teaching academics • Curriculum development should be developed with a contextual focus and using a constructionist approach, where students’ learning is centred on the creation of meaning by the students based on knowledge that is taught through the emphasis of its relation to real situations, and relevance by framing it in the context of the discipline • Curriculum development should fit within the culture of the school in a way that can be developed and built upon to ensure steps are in place to ultimately integrate education for sustainability in a way that is holistic and sustainability is no longer thought of as an add on component to the learning process or professional practice. • Reflection on the process for</td>
</tr>
<tr>
<td>• The project has sufficient funding to be able to buy out some portion of the academic champions’ time to dedicate to the curriculum renewal project. • The project has the support of high-level management, such as the ‘Head of School’ • The academic champions have the ability to empower and lead others. • The project benefits are understood and widely disseminated across the academic schools. • The project fits</td>
<td></td>
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within the culture and ethos of the academic school the renewal program is operating within.

<table>
<thead>
<tr>
<th>sustainability.</th>
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<tbody>
<tr>
<td>• Sustainability is presented as a generic concept that requires definition within a disciplinary context.</td>
</tr>
<tr>
<td>• The project team is seen as collaborators, but not as the driving force behind the project directing participants how they should define sustainability and what information should be included into the existing curricula.</td>
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<tr>
<th>curriculum review as well as review of the content and pedagogy associated with courses needs to be a regular activity.</th>
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<tbody>
<tr>
<td>• There is allocated funding for follow up once the project is finished to ensure change is ongoing.</td>
</tr>
<tr>
<td>• There is provision in the budget to develop resources to support those involved in the change process.</td>
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(Holdsworth et al. 200)
Appendix G: Summary of the Semi-structured interview questions with the YES/ESTS faculty

Aim of the YES Program

- The main aim of the YES program is to sensitise masters and PhD students from different disciplines and cultures to the concepts and complexities of Sustainable Development. The aim of the program is to do this in a unique way so that the emotional, social, moral, and ethical components of the debate are integrated into the more technical and scientific knowledge base of sustainable development. Additionally, it was seen as imperative to provide participants with a basic toolkit of knowledge and skills so they are able to make decisions and take actions. Sensitising in this context means exposing people to questions about the future of human development, while facilitating the development of a sense of importance to their own lives, and to nurture the development of community feeling within the individual.

Aim of the ESTS Program

- The educators program ran in 2005 and was made up of 16 participants from around 15 different countries. It was a shorter program than the YES program, one week, and addressed the issues of education and sustainable development from a global perspective.

- The aims are the same as the student program; however, the educators program also sought to explore and provide assistance with the practical implementation of sustainable development content into the learning and teaching practices of participants from a disciplinary perspective.

- To provide individuals with a framework that participants could take with them, which included practical examples of how they could bring about change their teaching methodology. Additionally, faculty commented that they sought to provide participants with the skills to assist creating a change in curriculum to include sustainability other programs within their universities.
Program facilitation

- There is one central office in Zurich and a number of regional project managers based outside of the central office. The core team directs all of the operations and regional work is directed by regional project managers. The role of the regional project managers is to work with the local networks and to understand local issues. There is a team of 6 permanent staff and 4-5 people permanently work in different regions. The core team responsibilities include running the day to day program, developing educational content, and the overall logistical framework for the program. There is also faculty from partner institutions (AGS universities and regional partners) some regularly attend the program and some teach specifically for one or two sessions.
- This structure ensure faculty understand the aims and objectives of the course/education. However, in some instance bad habitats get entrenched, and new staff members from different institutions are engaged to bring a new perspective.

Definition of Sustainable Development/Sustainability and Education for Sustainability/Sustainable Development

- All of the program team recognised and referred to the standard definitions of sustainability and sustainability education as being important; however, they abstained from defining these terms in any other way than as concepts because definitions “inhibits implementation of anything practical”.
- “Improving quality of life for all living things on the planet by improving the interaction between the human with the natural environment, and interaction between natural and social systems.

and

Understanding of how:

1. our actions now can impact the future (understand the impacts of our actions)
2. the sum of small collective actions can add up to a fairly potent force for better or for worse so society/individuals need to understand that the net sum of society’s decisions can be quite significant.”

- The key elements identified as forming the foundations of education for sustainable development include:
- “Education that is more holistic, for me this is firstly making sure that every human has a basic grounding in fundamental natural and social systems on the planet. Instead of being very mono-disciplinary it is about making sure that everybody has a basic knowledge, an understanding of the complexities and interconnections of absolutely everything. It is important to have experts within field but everyone should understand holistic concepts such as environment and economics, and this needs to be worked on first. The second fundamental concept for education for sustainable development is the nurturing of the development of core skills that allow you to put your knowledge into practice to affect positive change. Education of this kind must ensure students/individuals have leadership skills embedded with well developed moral and ethical values inline with sustainability principles.”

- “Educate for a shift in mindset so that people realize that any action, of any size that they take, has the potential to impact the future to affect the future. Additionally, if we can move society collectively to understanding the difference between positive and negative impacts then we have the opportunity to really have an impact on the future.”

- “sustainability means future pathways of human development”

Learning and Teaching Skills required for Education for Sustainable Development/Sustainability?

- The interviewees believed that there are a set of skills required by those wishing to teach Education for Sustainable Development/Sustainability. However, the skills identified differed and had different weightings of importance these include;

  - One interviewee believed that “I think that anyone from any discipline can teach, can understand, and discuss how their field or discipline plays a role in this sustainable development topic. But I think they need to integrate a mindset of impacts and actions with a future looking mindset.”

  - “Not just anyone can teach sustainable development. I think there is definitely a very big knowledge base that educators need to have. You need to have been through the process that develops this knowledge base. You can have a field of expertise but you must have a base
knowledge in fundamental natural and social systems. When I talk social system, I mean political economic systems, systems that are really driving our societies and how they function and then of course natural systems.”

- “Having an open mind despite having been educated in a mono-disciplinary way of thinking, having an awareness of the world and the key challenges faced, it is also about teaching didactical approach. They (educators) need to be much more open and allow a much more participatory environment where there is a greater opportunity for students to question, to debate, to learn from discussing from one another, and not just being the sage on the stage where they are just basically producing the knowledge and the students are consuming it. I think that is a fundamental relationship that needs to change.”

Is it necessary to educate our educators to teach sustainable development/sustainability?

- This was seen as Important but very difficulty as experience suggested that the academic participants were resistant to being taught/attending academic development programs; which, focussed on developing learning and teaching skills. Faculty discovered that participants were hesitant to open up, and explore different disciplinary approaches, and to move away from their particular field of focus to get a bigger picture.

Ethics and Sustainable Development Education

- “They are a fundamental part of any form of education. But especially sustainable development education as the goal is to try to encourage to rethink the way individuals values, and think about the world to achieve a achieving a paradigm shift.”

- Ethical and moral values are something that education plays a fundamental role in developing within society. Faculty commented that education is about our fundamental value set and our understanding of what our basic needs are, morally what we consider to be right and wrong in our actions. Faculty commented that this is something that is ingrained in cultural factors and is highly complex, and which the program attempts to address at a multicultural and multidisciplinary level. “Asking our participants to question and explore
what value sets people have from different part of the world, how are these culturally shaped, and how can we address these issues while keeping these cultural sensitivities in mind. This includes questioning and asking what our ethical values, understanding who, are while developing new ways of being.”

- While ethics and values are inherently important to education for sustainable development within both programs (ESTS and YES) it was commented that they were present as curriculum content. “We did more talking about the role of ethics and value in spirituality and morality. More talking about concepts rather than how we can change pedagogy, so students have more time to think about these issues.”

Learning goals

- The respondents all recognised that the goal of the YES program was to sensitise individuals to concepts of sustainable development. However, this is very generic response and if asked for more details different people gave different responses.
- “For me is this fundamental understanding of how this concept of sustainable development impacts different field disciplines areas of work and thinking. So no matter what your chosen career when you leave this place you have a basic grounding in what the concepts are. That is the ideal outcome but again different people may have different ideas. How is the course structured towards the participants own disciplinary practice? I think that personally this is an area where we don’t do as good a job as we could. If I was king of the world for a day I would structure what we do here at the end of each module or day so there is a conversation about how this all relates back to reality. I think a lot of this stuff is at high level. I think it is valuable good to have the philosophical and conceptual, but I think it is important for students to leave with a clear understanding about how this links to my research, studies, job, discipline and life. So, it is quite theoretical with some problem based ideas to work through theory, but not grounded enough in the reality of practice.”

Program Structure

- “The program structure and location is what makes the programs fundamentally different and unique. The programs are always set in a beautiful natural environment and this enable the students to think clearly and
interact with each other. The isolated environment ensures the participants are not distract by a big city, and allows them to bond and develop emotional connection within the group. It is a very intense experience and there is a natural sense of community that builds, and that is part of what we are trying to create we are trying to build and network and relationship of people. This is achieved with outdoor activities organised so participants interact and connect with nature. The approach to teaching and learning is varied and when students participate in lectures we always make sure they are interactive with questions, and small group work. We also ask that they participate in a number of workshops and they do group work projects. The group work is multidisciplinary and multicultural in nature.“

- A set of goals common to each course/seminar is that the multidisciplinary nature is critical. Participants are individuals with “different experiences disciplinary backgrounds and this works for a very rich learning experience. Taking things from business, science, social science, what ever discipline having different perspectives makes for a good learning environment.”

- It was identified by faculty that the multi-disciplinary can act as a barrier. “Cultural differences can make the material less accessible to different people, sometimes this is the result of the assumptions associated and sometimes it’s learning styles.”

- “Within society our organisations and institutions there is a huge lack of awareness of the issues and challenges we are facing. There is a huge benefit in taking people out of there institution in terms of creating change, and giving people life changing experience that create new ways of thinking and aspiration. However, the consequences of this is that going back is very hard and it is difficult to supporting them: as opposed to keeping people in their situation providing them knowledge while working within the institution itself this is of benefit because your are in there. That is the ultimate goal to be able to educate in both of those sphere that is what we are trying to do with the program we are developing. Firstly, we need to take people out of the environment that is constraining them. Removing them from the systems and structures that bind, so that they can think clearly in a new environment with new people and new ideas. Secondly, you need to be able to facilitate their implementation of these concepts when they return to this environment. You need to have educational systems in place where you can give practice
examples of what these people can continue to do, and provide them with a support network in their home/work environment so they can con with these actions. I feel that is what is missing at this point there is a disconnection of the two spheres. Does this impact on the long term outcomes of the course itself? I am sure it will remain in every participant mind as a big life changing experience they have had on these courses, but it is very easy to fall back into old habit without follow up. That is why we are trying to place students once they have been throughout the program in their own countries to see how they can effect change and then have another program that develops leadership skills so they can effect change and continue work hence the role of the region groups and the world YES forum project to bring it back to the local level.”

Educators Seminar

- “The educators program had a session where we looked at developing core knowledge. The point of this was to ensure that everyone was on the same playing field regarding what we thought sustainable development is, what we need to have a basic understanding in, what our students need to have a basic understanding in, and then to allow for discussion and debate amongst the group. The next part of the framework was examples of practical implementation at the subject specific level within universities, and then in more holistic courses. We also looked at mainstreaming sustainability education at the institutional level, and what that meant for life on campus.”

- “The educator seminar was about a self motivated approach but it was very difficult as they (the academic participants) were quite resistant. You had to be very careful about the material inputs you brought from professors from other institutions when they lectured. The academic participants were quite resistant to being taught by other professors. So, we tried to get people to come and provide examples of how they had integrated these concepts into their programs.”

- It was identified by the project team that there was a lot of debate when trying to establish a common language around sustainability and education. “That was one of the fundamental differences when it comes to educating educator versus the student they had a very strong opinion on everything. A consensus was reached on some core elements, but there are always so many details that have to be left for debate when it comes to sustainable development
especially around definitions of sustainable development. I think we came to more agreements on approaches to education then we did on definitions of sustainable development; which is interesting but for me that is the fundamental gap none of us can come to an agreement on. We all consider sustainable development to a broad vague concept of a better future for humanity and all living things on the planet. But I know when we put it into context and try to bring it to the application level it become very fuzzy.”

- The educator seminar was about bonding, one shared outcome was the development of a strong network of motivated like minded people around the world. The participants commented that they found then interaction and learning from each other the most beneficial part of the course.

- “One of the issues with courses on sustainability is that we talk about concepts but implementing and acting in projects is very difficult. The existing systems and structure which we want to work to change are barriers, but by trying to live amongst this, and be successful is difficult as they (the participants) get drawn back into the issues. “

- “My approach in the future would be a more open forum setting where they discuss their experiences. We tried to bring the professor down to them but hierarchy was still a problem because they are already quite engrained in a hierarchical system. The other problem was we took university level teachers and professors that were at different levels (PhD students to University Deans), so it was difficult to get a conversation as they had very different roles in the university, and had very different ideas about how things should be done. In the future I would do regionally specifically very focused to a target group. Would you have people of different positions of authority? I think you can do that if you have it regionally specific but the problem was we had too much diversity in cultures and different structural restraints to many differing levels. Additionally, institutional politics was problematic but also at a higher policy level e.g. policy set by government difficult when talking about how this will effect change. Always a trade off because it is always valuable for people to hear what other are doing in other areas to get radical concepts, but we need to find a way to combine that.”

- “The aims and objectives... “I think the initial objectives were one thing what we realized having piloted it once was that it needed to be slightly different. I think the initial objectives were going to bring together educators from high
schools and university level from around the world. Bringing them together to learn about how to integrate sustainable development concepts into their teaching. I think that was the objective. What I learned, as did the team, was that we can be far more effective by providing similar content and experience to what we provide to the students in the YES course. We want to give the educators a taste of what all this stuff is, what it means, and then let them determine as to how they want to introduce the information back into their classroom. We are not in a position to be educating educators on how to teach. I think we are in a position to be able to provide them content in a new and engaging way that they can then translate it into a form that works for them, and their environment, and I think that is how future ones will be structured as well. “

- The content of the course was essentially quite similar to the YES we had the modules we has a cross cutting conversation. The thing we did not do and in hind sight I regret was the case study research project that extended throughout the course. This is don’t happen as it does in the YES program due to the fact the educator course was only one week long.. They only worked on the project for the last day and a half and I think that was a mistake. I think that is the thing that these folk got the most out of. The educators were in my experience were more self motivated, self directed learners and we need the program to reflect this. I think in the future that they contribute most and contribute and assimilate it throughout and integrate in cool ways that we could never imagine.”

Educator seminars: Sustainable Development content and/or alternate ways to improve teaching

- From the experience of the program educators responded better to being given content and using that to develop material, they did not need or respond well to be lectured too.
Appendix H  Survey results ESTS 2005 participant survey

Demographics
All respondents work in teaching and research within HEI
Respondents are academics within engineering (environmental/chemical and material) or regional development
The geographical region participants were from are Europe/UK, Asia Pacific, and North America
Half the respondents were male the other half female

Education for Sustainable Development
- Development skills/capabilities should be built into all university curriculum
  100% of the participants responded that they strongly believed that sustainable development skills and capabilities should be built into all university curricula. Participants believed this is important as HEI educate future decision makers and therefore have a responsibility to include such material into curricula. They also believed that there is urgency for change, and that education is critical if the next generation is to act in all sectors of society differently to the current generation.

- Sustainable development education requires a certain knowledge base
  100% of participants believed that educators in HEI need certain knowledge to teach education for sustainable development. Participants cited that educators needed to be able to take a holistic, interdisciplinary approach with consideration given to both local and global implications of decisions and behaviours. They also believe that sustainable development education required academics to be system thinkers, empathetic, sensitive to other cultures and value different perspectives.

- Sustainable development education requires a certain skills/capabilities base?
  100% of participants believed that educators needed certain skills/capabilities to teach education for sustainable development. Participants believed that educators needed:
    - social competences
    - mythological skills
    - Creativity
• Open mindedness
There was also recognition that different disciplines require different knowledge and skill sets. Participant’s comments that this was important to recognize in the context of Sustainable development education as it has implication for the way in which sustainable development is framed in terms of content and approach

• Environment & social ethics (e.g. inter and intergenerational equity, social justice, ecosystems services) should be a part of Education for Sustainable Development
75% of participants strongly agreed and 25% agreed that ethics should be a part of Education for Sustainable Development. Respondents commented that ethics is the underpinning of sustainability, but this is difficult to teach

• Education for Sustainable Development should be taught in tertiary Institutions as a single subject.
67% of responded agreed that Education for Sustainable Development should be taught in tertiary Institutions as a single subject while 33% disagreed. Those respondents who agreed suggested that as single subjects it could be taught generally to a wide audience, and was easier to manage given the current workload of teaching academics, and given the amount of content that would need to be learnt. However, they recognized that single subjects would not lead to deeper learning and advocated that for such learning to occur the discipline needed to be integrated into relevant courses.

While those who did not agree that should be a single subject argued that it should be integrated into all courses “…we need to show it is (sustainable development) applicable knowledge and it should be default of every persons to think before acting.”

• Education for Sustainable Development should be taught in tertiary Institutions integrated into existing curricula.
50% of respondents strongly agreed and 50% agreed that Sustainable Development should be integrated into existing curriculum in tertiary Institutions. This would encourage a new way of thinking that is second nature rather than seen as add on content.
• Definitions of Sustainability/Sustainable Development
When the participants were asked how they defined Sustainable Development they used the Brundtland definition or its principles such as intergenerational equity. One responded felt the idea of spirituality needed to be added to the definition.

• Definitions of Education for Sustainable Development
Respondents defined Education for Sustainable Development as:
“change the default of people to always think before act.”
“learning the ways of thinking that lead to the sustainable “
“Education where SD is incorporated into all courses/programs”

YES Education for Sustainable Development Program/Course Experience
(Please answer these questions based in your experience of the YES Educators seminar held in 2005)

• Structure of the learning program i.e. intensive nature, out of your home institution, multidisciplinary, multicultural
100% of responded agreed that they enjoyed the structure of the learning program i.e. intensive nature, out of your home institution, multidisciplinary, multicultural and that it provided them with broad perspectives that are very critical when thinking and discussing education for sustainable development.

• Program learning goals and outcomes were made clear to you
All respondents agreed that the learning goals of the course were made clear to them. 75% of respondents agreed that the learning outcomes were clear while 25% said they were unsure.

• Achievement of the program learning goals
25% of respondents strongly agreed while 25% agreed that they achieve these learning outcomes. I believe you achieved these.

• Motivation and interest in the course.
All respondents strongly agreed that they were motivated and interested in the course.
• Relevance of course structure and content to participants teaching/learning/disciplinary practice.

25% of respondents strongly agreed while 75% of respondents agreed that the course structure and content was relevant to my own teaching/learning/disciplinary practice.

• Satisfaction of the program to provide participants with the skills and ability to build sustainable development concepts into their curriculum/research professional practice

33.3% of respondents strongly agreed, 33.3% agreed while 33.3% didn’t know if they were satisfied with the program in terms of providing them with the skills and ability to build sustainable development concepts into their curriculum/research professional practice.

• Suggestion to improve the learning experience?

There was no response to this question.

Overall

• Most important factors that contribute to a learning experience

Respondents cited the most important factors that contribute to their learning experience were the:

  • Interdisciplinary and holistic nature of the program
  • The open space
  • The ability to share in the knowledge brought to the program by the different participants
  • Open minds that were not judgmental

• Program use in enabled/assisted a change in approach to curriculum development and teaching practice

75% of respondents disagreed and 25% agreed that the program has enabled/assisted them in changing their curriculum and teaching /professional practice.

• Experience of any resistance to the adoption of material that you have generated as a result of this program within your social environment.
50% of respondents disagreed that they had experienced resistance to the adoption of material generated as a result of this program within their social environment. While 50% agreed that they had experience resistance and were unsure how to overcome this.

- If you experienced resistance how do you think this could be overcome? (please provide examples)
  No response was received to this question

- Support from the YES program team would assist me to implement the learning outcomes of this course.
  75% of respondents disagreed and 25% did not know if support from the YES team would provide them with assistance in the implementation of the learning outcomes of the course. Respondents believed that the support provided at the seminar was sufficient.

- Do you have access to appropriate resources to implement the learning outcomes of the program in your own institution/social environment?
  All respondents believed that they have access to appropriate resources to implement the learning outcomes of the program.

- My experience of the YES program have allowed me to have influence my social environment/Tertiary Institution.
  33.3% of participants strongly agreed 33.3% agreed and 33.3% did not know if their experience at ESTS program has allowed them to influence their social environment within their tertiary institution

- I would you recommend the program to others wanting guidance/supporting in understanding and developing curriculum which includes concepts of sustainable development.
  75% of respondents strongly agreed while 25% agreed that they would recommend the program to others wanting guidance and/or support in understanding and developing sustainable development curriculum. Participants cited the value of sharing and learning from others experience
Do you see this program/course as contributing to the wider community and disciplinary/professional practice? How? Please provide examples?

50% of respondents strongly agreed that the ESTS would contribute to the wider community and disciplinary/professional practice. Those having attended the program felt that it provided participants with the opportunity meet and learn from participants from other parts of the world. They commented that the program provided them with different perspective on education and sustainable development and allowed them to share new insights. The program also allowed for the development of a network of individuals to continue to learn and grow from
Appendix I: Survey results YES August 2006 student survey

Demographics of the Survey group
The August 2006 YES course was used as the short-term study and there was a 100% response rate. Of the participants surveyed 47% were male and 53% female, 31% were from an economics, business, marketing and law disciplinary background, 16% were from a health science, art, education, architecture and humanities and 53% a science, engineering.

The appropriateness to which the intentions (goals) of the curriculum materials match stakeholder needs inline with short-term expectations

Student expectations of the program
Participants stated that they were interested in the YES program as it presented a unique opportunity to explore sustainable development as a concept from both personal and professional perspective. They believed that the course offered from a personal perspective the opportunity to share their own personal experiences, have fun, and provide them with motivation and knowledge supported by internationally recognised universities. While from a professional perspectives it provided them with the opportunity to improve their knowledge of sustainable development from that of interest to something that would be relevant to their research and future professional practice. Additionally, it provided the opportunity to become part of a multicultural and multinational network was also cited as important.

Participants’ expectations prior to undertaking the program were to increase their knowledge on sustainable development both theoretically and practically. They expected to achieve this by working and learning from those currently leading the field in research and practise, and by sharing their knowledge and learning from other students’ experiences within a facilitated forum. This was seen as especially important given the international and multicultural aspect of the program. Participants expected a variety of experiences they expected to develop friendships and networks and for this to strengthen the dialogue around sustainable development and assist in the implementation of the knowledge acquired. Personal expectations of the participants were to have fun, and learn how to begin to deal with challenging and complex situations by thinking and acting in new ways, ultimately learning more about themselves and using the experience to develop and grow.
Having undertaken the program 35% of the participants believed that all their expectations had been met, 52% believed some of their expectations had been met while 13% were unsure. Participants commented their expectations had been met as a result of a good mix of theoretical and practical knowledge from different disciplinary and cultural perspectives. This allowed them to develop a holistic understanding of Sustainable Development. Participants also commented that the mix delivery methods, diversity of study areas, team and stimulation games created a safe learning environment where ideas could be shared. However, it was also mentioned that most of the content was aimed at the least knowledgeable in the room, and that owing to the intense nature of the course deeper discussion and how to implement real change was lacking.

The effectiveness of the goals /intentions of the curriculum materials in terms of achievability.

YES Learning Goals

37.5% of students found the learning goals clearly articulated. However, comments indicate that the learning goals were interpreted to mean learning about concepts of sustainable development. 25% believed that the learning goals of the YES program were somewhat clear, but they were unable to detail or write specifically what they thought these were. 25% responded that they were not sure and commented that in the beginning they were not clear but as the course progress they became clearer, these respondents commented that that they were not articulated well enough. 12.5% felt that they were somewhat unclear and did not remember if that had been given any goals. Participants commented that this was not necessarily a negative, but they found leading up to the course commencing they found the course content badly communicated.

40% of the participant believed that they achieved all the learning goals, and now have more holistic understanding of the dynamic nature of sustainable development. However, participants believed they reached these goals simply because they had learnt “many things that I believed I never knew”. 46.7% of participants believed that they somewhat achieved the learning goals suggesting that while their knowledge had increased, they still need time to internalise and apply the concepts, citing that would have been the real achievement. While others were satisfied with what they
had achieved; however, they suggested that they would have achieved all of them if they had more time for more reflection, reading, deeper discussion and absorption. It was commented that this was especially important for those students that don’t learn quickly and needed time to integrate new concepts and thoughts. 13.3% of participants believed they did not know if they had achieved the learning goals as they did not know what they were.

62.5% of participant felt that they were highly motivated throughout the duration of the program, 28.1% believed that they were highly motivated and interested in the program most of the time and 9.4% comment that were not sure. The range of topic, activities and experts included in the program captured participants’ motivation and interest. However, motivation and interest was lost due to the intensive nature of the program and the fact that this left them feeling tired. Participants also commented that sometimes there was not enough personal space and time to reflect on the materials. This was also evident in the fact that the majority experienced positive emotions while undertaking the program rather than negative ones.

Understanding of Sustainable Development

Students were asked how they defined sustainable development prior to undertaking the course and if the program had influenced their original definition and understanding of the concept. Their definitions focussed on the following concepts and terms: Living within the limits of one planet; inter and intergenerational equity; diversity; use and management of natural resources; personal and societal responsibility; locally adapted contextualised and flexible development; consciousness of our place within the ecosystem; systems perspective; interconnections between economy, environment and society, and the Brundtland Definition of Sustainable Development.

70% of the students responded that their definition had not been changed; however, there was recognition that their initial definition was simplistic. Having completed the course participants believed that their understanding was deep and more holistic. Participants commented that they now thought about their definition in a wider context than simply their own experience, they now consider other perspectives and priorities (both how and why these occur nationally and internationally), and the impact that this has on the translation of theory into practices. Participants commented that they recognised that the concept of sustainable development needs
to be thought about in specific contexts to be truly understood if it is to create lasting change.

The 30% of students that said their definition had changed cited formal institutionalised definitions of sustainable development such as the Bruntland definition and their understanding was vague and abstract. While they still used these definitions post program completion their YES experience had enabled them to create meaning in their definitions so that they became their own.

**Curriculum content and it usefulness in facilitating understanding of Sustainable Development**

The content models students identified as most useful in assisting their own learning where those containing new and interesting content and included different perspectives. Modules which provided content frameworks that systematically lead students through the concepts being presented, building on existing knowledge and deepened their understanding, were identified as most useful. Additionally, the interest and relevance of the modules was influenced by the learning and teaching skills of the presenter. One respondent commented “the teachers managed to explain in simple words complex issues and the passion when they did so.”

Students commented that the modules they found most interesting were those relevant to their personal lives/interests/studies, and those which allowed them to explore ways of applying the knowledge presented.

**Program structure and it usefulness in facilitating understanding of Sustainable Development**

**Multicultural aspect**

74% of the entire student cohort believed that the multicultural aspect had a significant impact on their learning experience and understanding of sustainable development; as it allowed them to understand sustainable development form a global perspective.
Multidisciplinary aspect
55\% of the entire cohort recognised the multidisciplinary aspect of the program; as it provided them with an understanding of sustainable development from different disciplinary perspectives.

Social aspect
52\% of the entire cohort recognised the social/personal element of the program citing that they had been inspired and motivated by other participants; while, continually learning about themselves.

Academic aspect
42\% of the entire student cohort identified the academic program as having an impact on their learning. Respondents recognised the role of interesting subject material supplemented with high levels of participation and interaction.

Location
35\% of the entire cohort identified the location as having an impact on their learning experience. “I have had plenty of experiences in multicultural programmes but this programme is unique in that the location is remote but beautiful and reasonably self sustaining, and the opportunity to hear such esteemed academics and professionals delivering presentations was a rich experience.”

Program Delivery
97\% of the student cohort enjoyed the flexible and interactive delivery of the learning program. Two particular delivery methods were highlighted as facilitating an enjoyable learning experience and improving understanding.

1. Experiential Learning

Field Trips
Student feedback on the use of filed trips as an alternative approach to content delivery was varied. Students commented that the filed trips provided them with a unique opportunity to experience how some of the principles taught in theoretical sections of the course were being utilised in local practice. The field trips added to the student experience by providing them with information about the local culture and environment in an interesting and enjoyable way. These experiences facilitated a deep emotional connection with the natural surrounding. However, those that did not see the excursions as relevant felt that there was not a clear link between the different excursions and the modules.
Artistic Element of the program

The artistic element of the program provided participants with a visual representation of the theoretical elements of the program. In addition it provided participants with an opportunity to explore their emotional responses to the program content. Students who found the use of art as a learning tool commented that it presented new points of view on the subject material; it provided a link between the participants and the program content; and it provided a break in the methodical presentation of material (lectures). It also was seen to link the individual concepts being presented back to sustainable development as a whole. This provided a holistic view of the course, and the concept; and gave individuals the confidence to think in different and innovative ways. Participants who did not enjoy the artistic element found it a little distracting and abstract.

2. Group work

The group work and simulation activities provided a variety of learning experiences and an opportunity for participants to hear and learn how others interpreted and understood sustainable development from different countries and cultural perspectives. Consequently, group work challenged their communication and negotiation skills; participants had to think about how they communicated with others, showed respect for others opinions and value sets, and reflect on the construction and evidence of their claims, about how to communicate this with tolerance and open-mindedness. Group work challenged individual’s ability to work on a large project with tight time deadlines, limited technical resources, and often complex group dynamics. Students commented that it was difficult to work with people who did not have the same levels of motivation or opinions, they believed that this required patience and understanding in order to share ideas and communicate with others effectively.

The impact of the program on participants.

Satisfaction with the YES program

47.1% were highly satisfied with their understanding of sustainable development as a result of undertaking the program. 38.2% were somewhat satisfied with their understanding of the program while 2.9% were not sure and 3.3% were slightly unsatisfied with their understanding of sustainable development as a result of undertaking the program.
40.6% of students believed that the program had influenced their future career pathways. 18.8% of participants felt that the program had somewhat influenced their approaches to their studies and future career paths. While 25% didn’t know to what extent the course have assisted them, 12.5% felt the program was not really any assistance while 3.1% commented that it was of no assistance. 85% of students having experience the YES program believed that it would impact on the wider community through both personal and professional practice. The participants believed that as part of such a large and diverse group their knowledge would diffuse into their professional careers. As individuals they felt that the program would contribute to their disciplinary areas but also as members of a connected group.

Those participants that were unsure of the impact on the wider community in improving the implementation of more sustainable practice questioned the conviction of those aware of environmental problem to act any differently from those that are unaware, and that communicating information of this nature in the hope of creating change was very difficult.

93.8% of participants responded that they would highly recommend and 6.3% said they would recommend the YES to those wishing to experience a similar program. Reasons citied ranged from the fun, great learning experiences, good way to build network for career opportunities, empowers and provides the tools for change. When asked if education programs on sustainability are important for all students to experience 81.3% strongly agreed, 6.3% some what agreed, 9.4% did not know and 3.1% responded not important at all. Comments ranged from:

- “It is critical for changing the current trends and to sensitize all the people about the importance of this issue.”
- “Everybody should have knowledge about the matter and try to apply it in their way of life.”
- “Educating people is the most important step to make the change.”
Appendix J: Survey results YES Alumni student survey

Demographic of the Survey Sample
360 surveys were sent out and 49 responses were received, providing us with a 14% response rate. 64% of participants were male and 45% were female. Of the participants, 6% were from economics, business, marketing, and law backgrounds; 33% were from health science, art, education, architecture, and humanities backgrounds; and 57% were from a science, engineering, and medical background.

The effectiveness of the goals/intentions of the curriculum materials in terms of achievability
YES Learning Goals
17% strongly agreed while 66% agreed that the learning goals were clearly articulated through materials provided prior to course commencement or in the orientation on the first day. Others suggested that the structure and systematic approach allowed the participants to determine for themselves the learning goals as the program progressed. However, many believed that the goals were quite abstract or vague. Many interpreted them to be “an introduction to the interdisciplinary nature of sustainability as a first step towards realising a sustainable society” or “learn about sustainability in multicultural and multidisciplinary setting.” 15% of participants strongly agreed and 72% agreed that they met the learning goals. While 11% remain undecided and 2% disagreed. Citing that they had hoped to gain more from the lectures and that the course could have been a bit more focused; it was too much in too little time.

Impact of the program on the participants
Influence of the YES program in changing personal and professional practice.
6% of participants were undecided and 11% disagreed that the YES program changed their personal and professional practice since completing the YES program. Participants commented that they already had goals in line with those of the program and that the program simply broadened their outlook and reinforced their passions. 30% strongly agreed and 53% agreed that the YES program made them more aware of their personal actions and the impacts on the environment; they now recognised that change begins with you, and that there are career opportunities in the sustainability area. The program was cited as giving participants confidence in their
abilities to tackle issues with full determinism, and work with people from diverse cultures and backgrounds.

**Understanding of Sustainable Development**
Participants brought with them to the program an understanding/definition of Sustainable Development, which included concepts of multi-disciplinarily, systemic links between social and environmental systems, increasing resilience of human and ecological systems, long term-ism, and repetition of activities without causing harm, equity, prosperity, equality, harmony and ingenuity, responsibility, economic activity without environmental and social exploitation, the Brundtland definition.

65% of participants said that the YES program had informed their definition of sustainable development and 35% said it had not. The program informed these definitions by providing personal meaning to each participant. 70% of participants believed that experience beyond the YES program had continued to inform their definition of sustainable development. These experiences included their own research personal, professional or academic; life experiences; association with organizations and individuals whom allowed them to reflect on their experience.

**Curriculum content and its usefulness in facilitating understanding of Sustainable Development**
Participants believed that the most important factors that contributed to the learning experience were:

- “The diversity (both disciplinary and multicultural) of the participants and facilitators.”
- “The complete immersion in the YES environment which made the learning experiences a very deep one.”
- “The mix of social and academic especially the use of group work and field trips providing an overall experience that was very engaging.”
- “The focus on student participation and interaction.”
- “Many causes in the field of sustainability are burdened with guilt, which makes youth want to stay away from activism, but the YES course was full of fun and enjoyment.”
- “The organization of the modules and the knowledge and expertise of the faculty the planning and coordination of the course the balance in terms of
group work and plenary lecture sessions and of course the diverse experience and disciplines of the student participants.”

- “The group work was really helpful the outdoor activities (where you could comment on what was discussed during the lectures) and definitely friendly presentations were absolutely crucial.”

All the participants enjoyed the structure of the learning program (lectures, field trips etc) citing they felt that the program, despite being an incredibly intensive one, had provided them a valuable mix of sustainable development theory and practice. The variety of activities on offer; lectures, field trips, stimulation activities, films and group work provided a complimentary experience that integrated a whole realm of issues and grounded them in real world experiences. Participants believed that the program made excellent use of the local resources available and this made learning interesting and practical. However, it was suggested that there be less theoretical content and more of a focus on the practical application of Sustainable development.

Program Structure and its usefulness in facilitating understanding of Sustainable Development

Academic aspect
53% of the entire student cohort surveyed selected the academic program as having the greatest impacts on their experience. Participants commented that it provided them, with an opportunity to learn from a variety or perspectives and that the presentations maximised interaction between participants. Additionally, it facilitated a cross-cultural/ inter-country understanding of current sustainability challenges. However, some participants suggested that the course was too short to explore all the issues associated with sustainability/sustainable development.

Social/personal aspect
73% of the entire student cohort surveyed selected the social/personal aspect of the program as having the greatest impact. Students commented that the diverse backgrounds and interests of the participants assisted their understanding of sustainability as it allowed them to see issues from other perspectives.
Multicultural aspect
38% of the entire student cohort surveyed responded that the multicultural nature of the course provided a challenging and interesting experience. It allowed participants to learn from different cultures, regions and experiences.

Multidisciplinary aspect
55% of the entire student cohort surveyed recognised the multidisciplinary aspect of the program as having the most impact. The multidisciplinary aspect of the program impacted on the participants in a way that forced them to think about problems and solutions from a variety of perspectives.

Location
76% of the entire cohort selected the location of the program as having the biggest impact. The beauty of the location had an impact on students, as many had never been to such a place. However, students recognised that it was very different to that of developing nations, if located in such a country a different learning experience may have resulted.

Effectiveness of the YES program compared to other short course.
The alumni believed that the YES course was a very effective short course as it allowed them to network, provided excellent resources for further research, it is a unique experience, good presentation and structure of material.

Motivation and interested in pursuing sustainability as a result of participation in the YES program.
30% strongly agreed 53% agreed that they were highly motivated and interested in pursuing sustainability within my personal and professional practice as a result of your participation in the course. Participants cited the increase in knowledge and the dedication, energy and enthusiasm of other participants left them motivated after the course to pursue sustainability. “I change a lot of personal behaviours after the program and try to encourage those around me as well. My personal choices as a consumer have been influenced quite a bit from the YES experience (including how I recycle the buying of produce and the gas/mileage efficiency of my new car.) It has also made me to be more conscientious of learning more about the corporations I
support. While 15% were undecided and 11% disagreed about how highly they were motivated after participating in the YES program.

**Resistance to the adoption of material generated as a result of the YES Program**

2% of participants strongly agreed and 23% agreed that they had experienced resistance to the sustainability initiatives participants tried to implement as a result of the YES course. 26% were undecided, 38% disagreed and 11% strongly disagreed. Those that did not experience resistance explained this as they worked in industries were people are already committed to sustainable development, or had been successful in articulating their ideas and the associated benefits.

Those that have experienced resistance suggest that a paradigm shift is always going to be difficult to achieve, either though lack of knowledge, don’t understand the urgency, interest or will. One participant commented that their organization is willing but not financially able. Other suggest that resistance they have faced in the education sector is a result of government policy, prescribe curricula, time and lack of interest from colleagues, siloed approach to disciplines, and in many academic institutions young faculty are "required" to become a disciplinary experts before they participate in multidisciplinary practice.

Those that have experience resistance believe that the follow are ways that we can begin to overcome this:

- “*Education and proper explanation.*”
- “*Increased communication across sectors.*”
- “*We must be able to be hard on the topics and soft on the people.*”
- “*Encourage people to make changes in their lives by explaining the differences by showing them easy ways to do it but most of all by living my life accordingly.*”
- “*Those of us who have had the fortune to be exposed to it and understand sustainability need to take some responsibility and become the leaders.*”
- “*Effectively providing clearer and practical examples of why things should be approached in a different ways trying to show the benefits of adopting a new way of doing things in your normal life.*”
The appropriateness to which the intentions (goals) of the curriculum materials match stakeholder needs in terms of application in personal and professional practice post course completion

Relevance of the YES program

72% of participants strongly agreed that they would recommend the YES program. 26% agreed and 2% were undecided. Overwhelmingly, participants believed the academic content of the program is targeted for those who are new to sustainability with an experience in writing and researching or for people who are experts in one field and want an overview of others/to network across fields. For people who have a broad understanding of sustainable development the concept will not be new, but there is still plenty to get out of the course. Participants believe the program offers a lot of opportunities to meet an international constituency of student’s young professionals and leaders who are passionate about making a difference in the world. Comments included “It also offers a complete immersion environment where you can learn a great deal about global sustainability while having fun!” “For the youth it is a good springboard to network and strengthen their role in addressing the issues of sustainability.”

67% of respondents strongly agreed and 29% agreed that EfSD should be a part of all students learning experiences while 4% remained undecided. The alumni believed that no matter what discipline area individuals are trained in the concepts of sustainability are applicable. Participants believed that sustainability could be taught as a basic ethic, as a way of widening your perspective of the world so that you can reflect and analyse your goals, directions, and action it was recognise that there should not be separate course on sustainable development within the education system but an integrated approach.

89% of respondents believed that the YES program contributes to the wider community in terms of improving our understanding of sustainable development, as it creates a community of professionals with sustainability as their common goal. The program provides participants with a firm grounding in the challenges and issues of sustainable development with the hope that these then will become change agents within their environments. The program also ensures there is a dissemination of information through out society by the alumni gatherings and activities. The alumni
network is also valuable as the participants promote what they have learnt in the program and likely to recommend others to apply. However, 10.6% of respondents did not believe that the program contributes to the wider community as it has limited outreach given the number of student who have undertaken the courses.

Participants felt very strongly about the link between ethics and sustainability education. With 67% of respondents strongly agreeing and 28% agreeing that ethics are a central part of such and educational experience: while 2% are undecided and 2% disagree. Responses recognised that the current approach to education was reductionist and needed to evolve to include an understanding of the systemic links between disciplines, actions and the resulting complexities. Respondents also acknowledged that without a moral awareness of human responsibilities to both the community and the ecosystem we will never achieve a more sustainable future. However participants recognised that the way “responsibility” is defined or thought about was different as a result of background and culture. “I think those coming from developed countries might have a different view of inter and intergenerational equity, social justice and ecosystems services.” And that “SD must explore equity/justice issues because injustice and inequity are contributing factors to for example continuing poverty. At the same time it’s difficult because discussing equity/justice end up introducing politics.” Participants also felt that is was courses such as these that provided such education “This was one of the key elements of the YES course, which I really loved and felt touched by.”.
Appendix K: Summary of Semi-structured interview with Forum for the Future HEPS staff.

Organisational Structure and Operation

- Forum for the Future is a sustainable development charity working primarily through partnership.
- Forum for the Future was set up to work practically to implement the sustainable development aspirations that emerged out of the UN conferences. Specifically, Forum for the Future was set up to work across all sectors working for solutions and partnerships across all sectors. It was recognised as vital that Forum did not become the expert, but an integral part of working in partnership with sectors. Key to the success of the organisation has been the partnership model.
- When Forum for the Future was first establish the education sector was not an area of expertise, but had been identified as extremely important to the development of alternative practices across all sectors. Consequently, it was recognised as vital for the organisation to develop capacity and skills in education and sustainability if they were too able to lead and work with authority in the area.
- One way of building expertise was the development and teaching of the Master in Sustainable Leadership.
- Forum for the Future distinguish between leaders and leadership. One interviewee commented that “Leaders tend to be anointed, appointed, and elected where as leadership is something that can be exercised by anybody anywhere whether is it in their own family, or any part of the workplace. or their private life. So we are interested in leadership as a life skill for all and sustainability literacy leadership as life skills for all.”
- The organizational approach to working with further and higher education in the UK is a systematic approach. One interviewee commented “We basically we have a very straight forward mantra which we apply. In order to get a system to change you have to work with the most important components within that system. There are 5 areas to require attention
1. Capacity building: mainly of senior managers, but sometimes others
2. Development of policy: at its simplest getting the word sustainability into policy and at the more sophisticated level getting them to change their HR purchasing etc
3. Development of the national policy framework and changing it so that it encourage sustainability.
4. Providing tools
5. Encouraging the recognition and reward of action: so that within the system individuals/group/organization receives positive feedback.”

- The concept of sustainability literacy stemmed from the notion that individuals need basic literacy’s to be able to live and work in the modern world and through the work of Forum for the Future these concepts were included in the UK’s Sustainable Development strategy
- “Sustainability literacy is a necessary part of teacher/academic education as building capacity for sustainability education is a classic change model which requires three things
1. People have to understand the need for change
2. People have to have the capabilities and the confidence to change
3. Must become part of the change process themselves by being able to recognize and reward good behavior in others.
This was the rationale for the development of the sustainability education curriculum tools.”
- “At Forum for the future we have developed a sustainability literacy framework which is the outcome based. It was developed to get around the endless debate and lists that result from deciding what sustainability content is. Additionally, it enables organizations like Forum for the Future and other enthusiasts to lobby and encourage without telling lectures how to lecture. It is empowering for lectures in that sense because we are just saying from our perspective this is the ideal outcome over to you quite an enjoyable challenge we think to actually produced graduates who are capable for doing this.”
- As part of the work of Forum for the Future developed two higher education partnership programs. One was HE21 “which basically was a very quick and dirty type sort of two year project working with 25 universities identifying best practice and publishing it and promoting it. The conclusions were that yes there is good practice out there and it is dependent on the people who promote it, and it is the people who form the best practice, but it doesn’t
necessarily result in institutional change. So the higher educational partnerships (HEPS) program was initiated, and it sought to create institutional change. We miraculously got funding from all the funding councils and it ran very well considering the money that it had. I think it was before its time. I think looking back it was a bit before its time, but what it did do was lay the ground of awareness in universities. Not just the 18 that we worked with but more broadly and particularly with the bodies that plan fund and regulate higher education. “

- Critical at all points to the HEPS program has been the engagement of the sector bodies. Most difficult was engaging with the curriculum and research. It was commented by one interviewee “I don’t think in retrospect we tackle it right. We believed it when they said it was too difficult and to controversial, and in that we were wrong. We were too passive in shipping it to one side and when we did the evaluation they admitted that they did not wanting to engage with it - it was too difficult – according to the academics and the researchers.”

- Engagement with the universities involved with HEPS was very much focused on them identifying their needs and ways Forum for the Future could help them. Forum was led by the partners. It was commented that “As we proceeded through the project it became apparent that work on sustainability literacy in the curriculum was not proceeding very well and not much was happening. This was a huge criticism of the program because core business is teaching, and learning and research not energy efficiency program and all the work was occurring in the property services area. Fortunately at that point Forum was approach by the Chilean government to help embed sustainability into the curriculum at the University of Antolagasta so together with the university Forum for the Future developed one of their sustainability curriculum development tools.”

- “None of the curriculum tools are rocket science but rather it is simply good educational practice”

- “The tools themselves were only published at the end of the HEPS program and they have not been developed into any sort of educational program. It is hoped that as Forum is restructured and education and learning is merged into the new Public Sector Department that there will be a focus on leadership and developing leaders, and that training and capacity building will be a major
focus. Currently the master program is one way we are doing this and the tools are the foundation of that program.”

• Forum for the Future has developed a number of tools which help people think through an approach to education and sustainable development. These tools were developed for academics to use within their own discipline, school, and workplace culture rather than under the direction of Forum for the Future. They were developed to build capacity in situ. Forum for the Future believed that working closely with individuals would not have created change. But approaching education change from a train the trainer way, picking out three of 4 individuals within the university probably within the academic development HR or PVC teaching and learning group, and guiding them through the activities, so that they could be the catalysts within the organisation would have had great impacts.

Sustainable development and education for sustainable development

• “I think the term is instrumentalist I look at sustainable development, and think education is an important way of delivering that.”

• “Sustainable development has been slightly over defined which enables people to say they don’t agree quite with that interpretation etc. A lot of what Forum or the Future is about is moving away from a set of words and moving more towards discussion of what sort of world we want to live in and what is a desirable type of future. Talking in those terms has resulted in an enormous amount of homogeneity in people’s responses. It has been ill served by politicians because it has been seen as a political orthodoxy; where as I see it as a condensed articulation of the world everyone wants to live in.”

• “I think ethics is part of sustainability and sustainability is not the environment essentially sustainability is about achieving economic, social and environmental goals at the same time. It is doing that together being able to think about whatever decision we are making whether it is in relation to the environment, people, and the economy. Thinking in the context of the three together, there is not culture for doing that, we have separate government departments, separate faculties/course in the universities, separate pages in the newspaper. So for me sustainability literacy is the capacity to be able to understand broad context of how and where everything happens; so that as
your making decisions and choices you are thinking about it in that broad context."

- “Sustainable development is about recognizing what you value, and then when you choose to make decisions you reflect on that, and make a decision based in terms of the outcomes you are able recognize because you able to see things differently, because you are able think differently because you were taught in a different way.”

**Creating change**

- “It is very important in my view to have a whole institutional mission that supports sustainability for change to occur. Universities are missing the trick with sustainable development; they are seeing it as either an environmental agenda, or an indoctrination of a new political ideology. What they are not recognizing is that embracing the sustainable development agenda enables them to get back to the sort of value frameworks that brings moral purpose back into universities…. It is my view that if they took on sustainable development they could re-orientate their purpose…. To me it is frameworks for making sense of a lot of things that academics don’t seem to be able to grasp at the moment …it is a new rearticulation of a very old set of ideas.”

- “It is about showing people that others have done it and come out the other side quite well. It is as much as possible about defining the outcome for people - if you do it this what this is what it will look like and that is a good thing. A lot is also attributed to confidence - we are lucky people feel confident working with us. We never profess to give the right answer, but that if you are working with us you are working in the right direction. This comes down to the general reputation of the organisation, and the expertise that sits within it - their track record gives people the confidence to take chances and to take risks, and then the ability to describe what it looks like so people know what they are getting into.”

- “Creating change is a systemic thing top down, bottom up, sideways. Whatever you are looking at it is about building positive feedback loops, picking out key individuals who control change, and sometimes that maybe the VC or an influential lecture. It is important to keep yourself outcome focused to ensure you steer away from ridged change management processes working with what seems to be the best approach to achieving your outcomes.”
• “You need leadership to inspire people to come with them. A sustainability leader is not any different to a leader in any other field.”

• “The institution led approach has it limitations. I am a much bigger fan of a discipline led approach. I think academics in general listen to other academics in their field rather than other academics, and then there is a problem with managerial culture. This is why we are doing all the work with the HEA because they are organized by disciplines, which seems to be a model that is working.”

Why do you think academics are resistant?

• “I think it’s a capacity issue at one level not really understanding what sustainable development is, and therefore not recognition its potential to be a useful way of articulating the broader purpose. There is also an issue with the management structure within higher education. The people who run universities are chief executives who are driven by targets, they are not necessarily visionaries.”
Appendix L: Summary of the ‘Integrating Sustainability Literacy’ Survey

Introduction
This research sought to undertake a sustainability literacy survey utilising a pre-tested framework (see project methodology) to identify good practice sustainability literacy techniques. The survey results were collated and key themes and approaches deduced as a way of promoting and sharing good teaching and learning practice across the tertiary sector. In this research sustainability literacy has been defined using Forum for the Future’s definition which defines a sustainability literate person as someone who is able:

1. Understand the need for change to a sustainable way of doing things, individually and collectively.
2. Have sufficient knowledge and skills to decide and act in a way that favours sustainable development.
3. Be able to recognise and reward other people’s decisions and actions that favour sustainable development.

The project objectives are:

i. To conduct sustainability literary survey of a number of lecturing staff affiliated with subject centre utilising a web-based survey;

ii. To develop a summary report of the findings including trends, outcomes, exemplar approaches to sustainability literacy as currently being taught, including recommendation to improve practice;

The Expected Outcomes included:

- Confirmation of the theoretical elements of EfSD being translated into practice within UK universities.
- Knowledge of the sustainability literacy content currently taught within the disciplinary subject centres as it relates to specific university subjects/courses.
- An understanding of the level of capacity that exists to teach it sustainability literacy.
Identification of sustainability literacy that can be shared with others wanting to develop sustainability literacy within their own subjects/courses.

**Project Methodology**

The consultation began with the identification of key contacts within each of the HEA subject centres. The contacts within the subject centres sent out the survey to academics currently developing and teaching sustainability literacy within their curricula. Once academics had been contacted the identification of courses and academics currently undertaking education in sustainability literacy and developing new teaching approaches would be a result of a self audit of course content, utilising the framework developed by Forum for the Future discussed below.

**Survey Questions**

1. **BASIC DETAILS**

   1.1 Submitted by:
   1.2 Name of undergraduate programme/degree and course/s or module/s and UCAS code:
   1.3 Educational Institution:

2. **WHAT IS BEING TAUGHT?**

   Please explain in the boxes provided how the course covers any of the following criteria, including teaching approaches and examples of curricula where appropriate.

   2.1 How does the course help students to appreciate/critically examine the need for change to a sustainable way of doing things, both on an individual and collective level?

   2.2 How does the course help students to acquire sufficient skills and knowledge to decide and act in a way that favours sustainable development?

3. **How have you developed this sustainability aspect of your course?**

   3.1 Is there anything you consider innovative or successful that academic colleagues would be interested in?
3.2 What, if any barriers do you see to incorporating sustainability in your courses?

3.3 What, if any opportunities do you see to incorporating sustainability in your courses?

Sustainability Literacy Survey Participants
The Higher Education Academy Subject Network of 24 Subject Centres formed the first point of contact for the survey. Additionally, surveys were sent out to individuals identified via an Internet search of course and degree program that contained sustainability content to raise the response rate.

Survey Response
The survey received four responses from the following HEA Subject Centre networks History, Computing, Economics, RE using the website model. Consequently, an email was sent to academic identified via internet searches of university websites. Fifty nine emails were sent out to 21 disciplines 11 responses were received with a response rate of 19%.

Total Survey Responses

<table>
<thead>
<tr>
<th>Discipline</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Built Environment</td>
<td>3 surveys completed 6 courses (two of the courses from the LEED MET Report on education for Sustainable Development Survey and Workshop run in 2005)</td>
</tr>
<tr>
<td>Business/Management</td>
<td>1 survey response 1 course</td>
</tr>
<tr>
<td>History</td>
<td>2 responses 2 courses</td>
</tr>
<tr>
<td>Computing</td>
<td>1 response 1 degree program</td>
</tr>
<tr>
<td>Economics</td>
<td>1 survey response 1 course</td>
</tr>
<tr>
<td>English</td>
<td>6 survey responses 1 degree and 5 courses</td>
</tr>
<tr>
<td>Health Studies</td>
<td>1 response 2 degree programs</td>
</tr>
<tr>
<td>Philosophical and Religious Studies</td>
<td>2 responses 4 courses</td>
</tr>
</tbody>
</table>
### Results: Approaches Used by the Survey Respondents to Development Sustainability Content and Skill

<table>
<thead>
<tr>
<th>Discipline</th>
<th>Sustainability Literacy Skill/Knowledge</th>
<th>Learning and teaching approaches use to assist students acquire skills to decide and act in a sustainable way</th>
</tr>
</thead>
</table>
| RE/Philosophy       | - Life Skills  
- Spirituality and Sustainability  
- What it means to live as a global citizen  
- Environmental ethics and values both traditional and contemporary ethical issues  
- Social justice, inter and intergenerational equity.  
- Central to religious perspectives on nature are questions of ‘domination’ or ‘stewardship’ in Christian traditions, Buddhist perspectives on the environment, and the re-emergence of nature based religious movements.  
- Natural cycles of birth, fertility and death  
- The global environment, limits to growth, sustainability and values, anthropocentrism, dominion and stewardship, and lifestyle and politics.                                                                 | - Contextualising spirituality as a curriculum focus within the context of today’s community from both a local and a global perspective.  
- Understanding of personal responsibility in terms of relationships with the community and environment.  
- Reflection and discussion of personal values and concerns about the world.  
- Understanding of personal impacts on the planet using the ecological footprint and then using this as a focus to link citizenship to the world as a global community.  
- Transformative learning utilising learner centred classes and reflective journals to address individuals’ meaning of life and lifestyles.  
- Discussion of ethics provides students with an opportunity for reflective inquiry into areas such as animal rights, the place of humans and animals within ecosystems, the intrinsic worth of nature, the importance of future generations, and social justice. |
<table>
<thead>
<tr>
<th>Subject</th>
<th>Topic</th>
<th>Content</th>
</tr>
</thead>
</table>
| English | Ecoliteracy and Ecocriticism | • Understanding of environment.  
• Understanding of how literature creates and shapes an understanding of environment in both a historical context. |
|         |       | • Use of debates to explore ideas from multiple perspectives increasing understanding of the issues and to improve the articulation of ideas to a wider audience. |

Discussion on Natural cycles is particularly relevant to sustainability issues, since natural cycles are being disturbed, and the consequent habit loss and extinction is leading to what has been called the ‘death of birth’ for many species.

Students are encouraged to take and environmental perspectives when considering issues such as religion, ethics, theology, biblical studies, church history, ministry and mission.

Students reflect on their own engagement with sustainability issues.

Explorations of relationships between philosophical systems and ecological destruction.

Exploration of connection between sustainability issues with social justice when learning about prophecy.

Exploration of different ecological perspectives across religion and nature-based religion among feminist groups.
and contemporary way and how this informs the way as individual and society relates to the environment as a consequence.

**Animal Rights**
- The question of ethics and animals as represented by fictional representations of animal lives.
- To think about the obvious in relation to the text read and then critically analyses this.

**English Literature**
- Study of authors whose life and work reflects a sensitivity to, and deep appreciation of, the natural world. The Romantic tradition in particular vividly expresses the beauty and intrinsic value of nature, and critiques the alienation and ecological destruction caused by misuses of technology. In addition to Romanticism, the curriculum includes the Transcendentalist movement in 19th century American Literature, and numerous nature poets and prose writers of the 20th & 21st centuries.

**Creative Writing**
- For students likely to face issues such as the sixth great wave of extinction, the end of oil, climate change, a large increase in population, and a world
- Connection between the academic theory and relationship to action and responsibility.
- Raising the question of ethics and animals, without taking a particular ethical stance and inviting students to pursue their own interests.
- Asking students to think about what is often taken for granted. This can lead to more detailed analysis of the possible ethical implications of such questions requiring students to look deeper into problems, think more abstractly, moving beyond the immediate to the more general.
- Through close examination of nature writing, students can discover for themselves what Bate’s describes as ‘the capacity of the writer to restore us to the earth which is our home’ (in The Song of the Earth, Picador, 2000). The discovery comes when students self-reflectively apply what they learn from the life and work of nature writers to their own life, seeing the world from new perspectives, and reconnecting with place. This can contribute to their understanding of natural systems, and helps them discover ways of satisfying fundamental human needs without exploiting natural resources.
where billions are malnourished, contributing to sustainability may well be among their goals. These concepts can be explored by students in their writing, but it has to come from them there is no explicit direction around these issue for inclusion in their writing.

**English Language**

- Awareness of the role that discourses (such as certain discourses of economics, scientism, industry, intensive agriculture and lifestyle magazines) play in encouraging behaviour which leads to ecological destruction. Students are then encouraged to explore alternative discourses from a wide range of sources including environmentalist writings, literature, nature poetry and religious works, in a search for ways of representing nature which can contribute to a more sustainable society.

- Increase students’ awareness of cultural and social structures which are implicated in ecological destruction, and explore ways of transforming these structures towards a more sustainable society.

- Discourses such as environmentalism, ecology, biology and animal rights, asking if they have the

- The Creative Writing curriculum generally does not explicitly mention education for sustainability, although the activity of creative writing offers students the chance to search for new ways of representing the world in line with their core values and goals.

- The importance of creative writing is underscored by the words of Thomas Berry: “It is all a question of story; we are in trouble just now because we do not have a good story. We are in between stories. The old story, the account of how the world came to be and how we fit into it, is no longer effective” (in The Dream of the Earth, Sierra Club, 1990). Students who are joint with English Language will already have awareness of how certain writing styles and representations of the world can be implicated in ecological destruction, and students who take English Literature will be aware of alternative ways of representing nature and human’s place within nature which can contribute to sustainability. Creative writing offers students a chance to revitalise ways of writing from the past, making them relevant to the issues of the modern world, and to create new ways
power to reconstruct models of reality in ways which can contribute to sustainability. The limitations of such discourses to transcend the assumptions of destructive discourses are carefully investigated.

- Exploration of radically different ways of constructing nature, looking at a wide diversity of discourses from ecofeminism to nature poetry. Exploring ways that students themselves can contribute to sustainability by writing in ways which combine a diversity of discourses, for instance, combining technical science writing about biology with lyrical language which affirms the value of the life being discussed.

- The skills required to critically analyse language are built up throughout the curriculum, from theoretical to practical analysis modules. Examples relevant to sustainability and social justice issues are used to illustrate theoretical principles, and are used as data for practical analysis. This includes issues associated with social change, and effective ways of participating in change through persuasive writing and public speaking. Additionally, there is the opportunity within English Language programs to commitment to language diversity, central to environmental justice issues, sustainable communities, and a sense of place and connection to local ecosystems.

- The English Language field develops skills in critical discourse analysis, which can help reveal patterns in language that contribute to sustainable/unsustainable behaviour.
| | • The English Literature field helps students discover new perspectives on nature and the place of humans in ecosystems through developing skills of analysing representations of nature in literature in the context of the life of the author. |
| | • The Creative Writing field enhances students’ skills in creating new ways of writing and producing new ‘stories’, some of which might help contribute to the transformation of cultural structures. |
| | • The Creative Writing field also develops self-reflection skills to help ensure that the writing reflects the students’ core values. |
| | • The technique used is critical discourse analysis - close reading of texts in ways which help reveal the underlying social structures they are based on. This is achieved by analysing discourses which have a potentially negative impact on the ecosystems which support life, such as certain discourses of economics, consumerism, masculinity, and intensive agriculture, as well as constructions of progress, success and convenience. |
| | • Encouraging awareness of how texts create social structures, which in turn have an impact on |
ecosystems (for instance, consumerism and the creation of dissatisfaction that drives it is constructed primarily through language and visual images, with consequential damage to ecosystems). This opens up the possibility for students to work towards exposing and resisting discourses which are implicated in ecological destruction, and promoting or creating discourses which can contribute to a more sustainable society. In order to reveal discourses which have a potentially negative or positive impact on ecosystems, students need both linguistic analysis skills and an ecological framework to apply them within.

- The ecological framework is not simply given to students, because there is no one framework which has yet proved ideal in contributing to a sustainable society. Students instead develop skills in creating their own ecological philosophy, or ecosophy, which evolves in an ongoing way, both informing and being informed by their analysis of texts.

- The process of reflection to arrive at an ecosophy is sparked off with a simple question ‘what is wrong with artificial lawns?’ Students then generalise their
responses into an initial ecosophy: for instance, ‘because artificial lawns cannot support a diversity of life’ becomes an ecosophical recognition of the value of biodiversity and non-human life. This starting framework could be used in conjunction with textual analysis to discover ways that a variety of important texts promote or deny the valuing of biodiversity or non-human life. Initially, the ecological framework will be crude, but is constantly updated as the students read more, and, crucially, compare their evolving ecosophy with their direct experience of natural systems.

| Economics | • Ethics and behaviours as they relate to economic policy and impacts on society and environment.  
• Role of governing structures and the ways they relate to each other.  
• The systems of economics and the impacts on the environment  
• Environmental problems from both a local and international perspective.  
• Understanding of policy, market and institutional factors that promote or constrain innovation. | • Use of microeconomic tools to analyses environmental problems from both a local and a national perspective.  
• Use of real environmental policy cases studies to explore the tensions between policy and associated impacts.  
• Use of practical examples of day- to-day ‘sustainable behaviours’ and media to provide relevant and contemporary scenarios for discussion. This also links professional practice to theory. |
| Computer Science | • Business ethics | • Use of team-work with competition at its core and by |
| Built Environment Engineering | • Sustainable Building Design  
  • Working with different professions to develop sustainable projects/designs  
  • Decreasing the impact of building on the environment and improving the community within them.  
  • True cost pricing  
  • Climate Change, energy supply and conservation as it relates to the build environment  
  • Understanding of the interaction between the built environment and natural environments especially as it relates to the use of energy resources in both the present and future contexts.  
  • Understanding of International, national and local  
  | placing time constraints on the work students are forced to build a large body of knowledge quickly with their team members and then share that with their class members  
  • Issues are raised and then contextualised within their chosen discipline and the world around them.  
  • Role-play exercise built around a business style scenario that allow students to explore a range of sustainable development issues both inside and outside their discipline.  

| • Corporate Social Responsibility  
  • Environmental Management  
  • Business Case for Sustainability  
  • Sustainability Policy and other governing mechanisms  
  • Health and Safety and the environmental impacts i.e. recycling associated with manufacturing both in a local and global context  
  • Relationship between government and business.  
  • Sustainable design  
  | The use of project work, case studies and building models ensure that students are engaged in a much broader view of the discipline area energy so often the issue used for this exploration. The project work and the model building utilises creative thinking and provides students with the opportunity to engage in solving problems they will face in the workplace while developing and discovering tools that can assist them to decrease the impact on whichever part of the built environment they are working in.  
  • The use of experts as guest lectures is also a way of providing students with the most up to date disciplinary practice.  

government policies and strategy on issues of the natural environment as it relates to the build environment i.e. energy policy and regulations and initiatives such as the European Carbon trading Scheme.

- Understanding of policy, market and institutional factors that promote or constrain innovation.
- Arguments for sustainability in design and implementation and a understanding in technologies that deliver efficiency in the use of natural resources to decrease environmental impacts while improving social capital.
- Understanding of the build environment to inform system design.
- Understanding of the role of technology as it relates to environmental and economic impacts (the business case for sustainable development)
- Materials their lifecycle and CO2 impacts
- Recycling through the concept of building refurbishment and architectural reconstruction recycling using whole of building and management design projects
- Environmental Science and services.

- A deeper understanding and appreciation of design and construction choice as experienced by practitioners that will lead to students making the right decision in practice.
- Allow students to see themselves as technology focussed – this widens their horizons, allows them to see how solutions fit into the wider picture connection to transport, materials, policy and climate change. It also promotes long-term thinking.
- Understanding of the consequences of decision in the long –term and the ability to explore those impacts and make alternative decisions or redesign systems so as to decrease impacts.
### Design issues
- Design issues that include efficiency and sustainability such as climate change and carbon emissions
- Environmental management especially with a focus on energy issues in buildings and estates and an understanding of how this then informs management policy for the environment.
- Mathematical subjects can including modelling to look at current and future impacts of design allowing for improved decision making.

### History, Classics and Archaeology
- Exploration of previous civilisations and their relationship/understanding of the natural environment and the impacts this had on their culture and ultimately their own sustainability i.e. the Romans vs. the Chinese.
- Environmental justice issues by developing cultural understanding of the ways in which landscape is used as a tool for the establishment and maintenance of power and control
- War and peace
- History of the environmental crisis
- The relationship between nature and culture through an understanding of landscape representations.

### Other Issues
- Exploration of past and present values and the implication for current and future conditions
- Methodological issues of archaeology provide students with the opportunity to examine the ecological destruction of a past civilisation and the consequences of that destruction
- Use of case studies of a specific landscape such as a gardens, which are considered as complex aesthetic, intellectual, political, social and economic statements.
- War and peace are important themes in the history curriculum, and ones which highly relevant to sustainability since a sustainable culture can only exist if there is peace, and resource shortages are
The history curriculum also gives students a chance to discover more about the roots of the environmental crisis by analysing the impact of the industrial revolution on communities and nature, the changes that occur through rural depopulation and urbanisation, and the relationship between systems of governance and the mastery of nature.

The notion of landscape as representation is introduced in the first year, developed in a rural context at level two, and further deepened in an urban and imperial context in the third year. Through discovering more about how societies distanced by time and space related to the land, and the consequences of those relationships, students can gain new perspectives to inform their own relationship with land, and can contribute informed opinions about the social changes necessary for sustainability.

| Business/Management | • Global issues, interdependency and the role of business in promoting sustainable development  
• Corporate Social Responsibility.  
• Business values/ethics vs. environmental impacts | • Identifying and describing future sustainable development conditions and exploring ways in which business might help to achieve this. Exploring initiatives such as shareholder activism and |
and social values.
- The role of the corporation in defining societal norm and behaviours/practices.
- Corporate social reasonability in creating alternative ways to operate.
- Critical reflection and practice and techniques (active learning) to empower students to take responsibility in their own spheres of influence

| Public Health | Sustainable Development and Health
Sustainable Development and Public Health as it relates to issues such as food miles and long term impacts of climate change. | Development of a range of transferable skills relevant to study and present and future careers |
| Geography | Sustainable cities, planning and design project, policy making, developed vs. developing world | Through the use of hands-on case studies, visiting lectures and guest speakers
Use of videos external people with knowledge and understanding, active rather than theoretical encouraging alternative thinking and approaches. |
Summary of Sustainability Literacy (Knowledge and learning and teaching approaches)

Overall: Curriculum Renewal and Course Development

The overall findings of the survey identified two approaches when developing and embedding sustainability literacy into the curriculum. The first uses an integrated, holistically approach to embedding sustainability into existing course/subject. This is with the aim to allow students achieve a deeper understanding of sustainability so that they are able to use their learning to make informed decisions and choices in their personal and professional practice. Holistic emphasises the need to move from ‘reductionist’ approaches towards making interdisciplinary and systemic connections between disciplines. Critical to this approach was to ensure that students are able to think critically so they are able to identify and analyse the broader societal, economic and environmental connections for the subject area, while demonstrating respect and sensitivity for all subject areas.

The second approach was the development of sustainability modules/courses that were components of the overall degree programs of a percentage of class time that introduce sustainability into the curriculum, as a specific concept to be latter related to disciplinary practice as a means of contextualising the content to the learner. This approach involved developing basic sustainability modules within existing courses that were not necessarily thought of as having relevance to sustainability prior to working with the project team. Stand Alone Courses involved developing stand alone sustainability modules/courses to be undertaken by students within the discipline. These courses were developed to provide students with the theoretical understandings of the many practical solutions to sustainability within the context of their discipline, as taught in its entirety.

Approaches embedding Sustainability Literacy into the curriculum

Education for Sustainability is a challenge for educators as the material is complex and requires new ways of thinking and presenting - given that traditional didactic strategies are often inappropriate (Papadimitriou, 2004). Material identified focussed on curriculum that allows students to learn how to think in a more integrated fashion. It was found that where possible curriculum material was developed with the goal of student learning outcomes that focussed on current and potential professional values.
and practices. Content was structured so that all students at some point within their studies would understand some or all of the following:

A. How their discipline area and professional practice functions and affects the natural environment (e.g. its sources of food, water, energy, endpoint of waste) and its contribution to a sustainable economy.

B. How their discipline area and professional practice builds social capacity (such as, how employees are involved in decision making, their status and benefits etc)

C. The basic values and core assumptions present in the content and methods of their academic discipline. (Adapted from Clugston, R. & Clader, W. 1999)

The learning Outcomes associated with innovative approaches to sustainability education, ensuring the development of sustainability literate graduates. These then need to be tailored to the specific discipline area.

1. Demonstrate an understanding of sustainability and its implications for organisational practice;
2. Analyse the social, economic and political contexts of organisations, including global issues;
3. Reflect critically and holistically on the complex ecological and social issues that impact on, and are impacted on by, organisations;
4. Apply systems thinking to the analysis of interconnected sustainability issues; and,
5. Work collaboratively with others to explore and manage competing perspectives.

Approaches to the development sustainability content
One of the identified issues addressed by the survey respondents regardless of discipline was the level of scientific complexity involved in the material. Respondents commented that when developing curriculum it was necessary to determine the depth of the scientific understanding required for students to understand the subject material. This also needs to consider the level of scientific knowledge that the students already possessed. In the case of the English Discipline many students had limited if any scientific knowledge which proved challenging when presenting concepts of ecoliteracy or simply asking students to reflect on how society or
individual view environmental or social issues without thinking in a political framework. In the instance of Engineering while scientific knowledge was apparent it was specifically focussed and it needed to be broadened to truly understand the impacts of their decision-making.

However, it was also recognised that when developing curriculum content it is easy to simplify the complexity too much so that sustainability education becomes about solutions and the theoretical underpinnings of these initiatives are lost. Education has moved away from simply including specialised material based simply on theoretical concepts otherwise there is the chance it become reduced and losses the complexity of real life. Education identified by the survey uses real life problems and experiences as learning situations to avoid the kind of reductionist ‘solutions’ to assist in the evolution in education. Students must be made aware of both causes and prediction effects, of the uncertainty surrounding it, as well as of its economic, political and social dimensions, if they are to be able critically think, reflect and act personally and professionally in alternative ways. A student who has grasped the concept of sustainability will understand that human actions have complex environmental and normative consequences. Understanding the problem is fundamental to constructing the solution, and not prescribing solutions is fundamental to encouraging creativity, a key component of the integrated design approach (Hayles and Fong 2005).

**Approaches to Integrating Teaching Practice to assist the learner to act in a more sustainable way.**

Traditional ways of teaching sustainability education to ensure the learner is fully able to understand and choose to act in alternative ways based on transmission of knowledge, are inappropriate, as they do not help students to use the knowledge learned to understand real issues from everyday life (Papadimitriou, 2004). As a result, a progressive move away from the traditional lectureship style of teaching to a more hands on approach has been identified. In this instance EfSD personalises the learning experience, reconnecting individuals with nature so that interest and a sense of responsibility to protect the natural environment and develop social security. Developing capacity for enacting (non-prescribed) change should develop the capacity for change, rather than imposing a particular type of change on students. This approach makes it easier for the learner to foster values and behaviours, deepening their understanding of the issues, and allow them to recognise the
importance and complexity of the decisions they will be asked to make in their personal professional lives while recognising and rewarding such behaviour in others. The approach taken by the survey respondents involved challenging preconceptions, challenging their way of thinking and to show students that they can make a positive difference to the state of the world and that there is hope for a sustainable future.

One of the identified and successful ways of engaging students and enhancing their awareness of the sustainability issues was to personalise the experience, allowing them to take ownership of the notion of sustainability. Approaches to Integrating Education for Sustainability included:

Presentation of Sustainability Content

- Problem solving exercises which include influences on the environment, community or economy;
- Using sustainability topics/principles/concepts to show the relevance of the subject matter;
- Use of sustainability case studies in material or as sources of information; and,
- Using guest speakers.

Skill Development using Sustainability Content

- Using a sustainability context/case study to teach a concept or skill:
- Use of audio visual material, websites and literature to develop critical thinking skills; and,
- Setting assessment tasks around sustainability concepts.

Educational approaches developed and used in pursuing this approach has resulted in the incorporation of tools such as the Ecological Footprint, which require students to measure their personal contribution to resource consumption and waste production. These results are then directly related back to decisions they may make within their discipline this has been used by both the RE and English Disciplines The Ecological Footprint and the use of field trips in teaching stimulates interesting and controversial discussions not just about the focused questions, but also about ethical topics such as equity and responsibility. Teaching directed towards promoting more sustainable lifestyles still respects the freedom of the individual to live their lives as they wish, and allows students to find their own areas, reasons, and procedures for conserving behaviour.
Discipline Specific

English

English is concerned with ‘representations’ on the basis that representation and available language influence thought and perception. English has a strong tradition of defining itself as a space where other values may be voiced and discussed. ESD has been perceived as being aimed at the action of individuals and it is critical that ESD equips students to see the responsibility of state and corporate actors towards issues of sustainable development, as well as individuals. Sustainable Development Education within the English discipline can be a bridge to translate the disciplinary gap between the humanities and the sciences. In pedagogic terms sustainability literate graduates need to have a critical understanding of how discourse of environmental issues are created for public consumption and how the framing of these discourses impacts (or fails to impact) upon human responses (Dawe et al. 2005). Science itself is highly contested discourse, but the language used to encourage action on the part of individuals, governments, business, non-governmental organisations, individuals and other agents is even more so. The ways in which different languages articulate these issues is potentially very diverse.

Sustainable Development issues that show relevance and have been built into English courses include:

- Diversity. English has had an increasing commitment to human diversity since the ‘theoretical revolution’ of the 1970s,
- Biodiversity in the scientific sense is not thought relevant to the subject, although pastoral poetry has a long history of engagement with and celebration of the natural world.
- Intergenerational justice. Such issues might be raised in the context of genre studies modules such as utopian or science fiction, but the general orientation of the subject is towards the past and present.
- Uncertainty and precaution while most English students would assert a commitment to uncertainty, they would most likely think of it in terms of the subjectivity of literary interpretation rather than scientific uncertainty.
- Social justice.
- Interdependence. Whilst ecocritics would see interdependence as the central quality that environmentally conscious literature has to recognise, this concept is not seen as relevant in the subject as a whole. Citizenship and stewardship
are concepts not seen as directly relevant to the subject, although the dedication of English to the idea of independent critical thinking, and to the exchange and critical discussion of ideas in the public space of the seminar or workshop, has in it an implicit concept of citizenship and its responsibilities.

- Efficiency and sufficiency

Within the English Discipline there is a strong tradition of ‘ecoliteracy’. This concept involves comparing literature (both fictional and non-fictional) with environmental realities, in a critical way. The disciplinary area is also well used to progressing particular value systems (e.g. Marxist and Feminist) (Dawe, 2005).

The following is a list of suggestions for integrating ‘Sustainability Literacy’ in curriculum developed from the work of Garrad and Kerridge (2005) and the results of the ‘Sustainability Literacy Survey’

- Clear definition of key terms in ecology and sustainability.
- Graphic illustration of threats to SD, including population, biodiversity and climate change.
- Brief position statements from named authorities on contentious issues such as the compatibility of environmental sustainability and economic growth, the role of multi-national corporations and free trade.
- Interactive learning resources for self-evaluation to encourage a sense of personal involvement and implication. For example, students are asked to calculate their personal ecological footprints, carbon footprints and explore their surrounding through field trips, as it has been noted that high levels of environmental awareness do not necessarily lead to high levels of action (in terms of recycling for example). A sustainability literate graduate will understand that it is action, not knowledge that is critical to the health of the world.
- Particular texts are evaluated in terms of their environmentally harmful or helpful implications. What sort of assumptions about the natural world and the right way to treat it.
- Analyse of the history of concepts such as ‘nature’, ‘human’, ‘animal’, ‘rationality’ and ‘civilisation’, in an attempt to understand the cultural developments that have led to the present global ecological crisis.
• Non-fiction nature writing, previously seen by most types of literary critic as a minor genre of literature, is repositioned as a major genre, deserving the same sort of critical attention as the novel, poetry and drama.

• Comparative studies are made between the literature of indigenous, non-industrial cultures, the literature of industrial and colonial cultures and the literature of postcolonial cultures, to evaluate all of these in ecocritical terms and produce a new ecocritical literary canon.

• Understanding of scientific concepts relevant to sustainability, such as ‘ecosystem’, and philosophical concepts such as ‘anthropocentrism’ and ‘ecocentrism’.

• Using environmental topics in creative writing.

History and Classics
Ecology came to greater public attention with the rise of environmentalism in the late 1960s and the sub-field of ‘Environmental History’ evolved in this climate. Environmental History has been the focus for various departments around sustainability and resource use (Dawe et al. 2005). This has informed curriculum material within this discipline with a focus on an analysis of the power relationship and dynamic in past human-environment interactions. Students are able to examine the ecological destruction of a past civilisation and the consequences of that destruction. War and peace are important themes in the history curriculum highly relevant to sustainability since a sustainable culture can only exist if there is peace, and resource shortages are predicted to cause global conflicts on a large scale in the future. The history curriculum also gives students a chance to discover more about the roots of the environmental crisis by analysing the impact of the industrial revolution on communities and nature, the changes that occur through rural depopulation and urbanisation, and the relationship between systems of governance and the mastery of nature.

Environmental history is often related to regional and local history to landscape history and to rural and urban history. It introduces students to environmental justice issues by developing cultural understanding of the ways in which landscape is used as a tool for the establishment and maintenance of power and control. The history curriculum also addresses the historical development of the relationship between nature and culture through an understanding of landscape representations.
**RE/Philosophy**
Within this discipline there is a real opportunity to draw on interdisciplinary work to the complex questions facing today’s global society such as sustainability. While ESD is not an essential topic of study there is a strong tradition of teaching and learning in this area. Within these disciplines students are encouraged to engage in critical thinking, to challenge their assumptions and to become aware of different cultural perspectives on the issues that are taught. Ethical reflection, including reflection on the environment and social justice issues, and also gives students skills in systematically analysing the positive and negative influence that religion has on sustainable development.

Concepts that are taught which bring sustainability literacy into the curricula include environmental ethics, business ethics or development ethics in both a current and historical perspective. Ethics serves as a vehicle for reflective practice when thinking about our interaction within society and the environment in areas such as animal rights, the place of humans and animals within ecosystems, the intrinsic worth of nature, the importance of future generations, and social justice. Central to religious perspectives on nature are questions of ‘domination’ or ‘stewardship’ in Christian traditions, Buddhist perspectives on the environment, and the re-emergence of nature based religious movements. While discussions and activities around natural cycles raise questions of change, disturbance and the consequent habit loss and extinction is leading to what has been called the ‘death of birth’ for many species. Other sustainability issues that fit well into a OTC curriculum centres around issues such as the global environment, limits to growth, sustainability and values, anthropocentrism, dominion and stewardship, and lifestyle and politics, actively engaging with students to consider their own engagement with sustainability issues. Sustainability can also be connected to issues of social justice.

**Computer Science**
Area where ESD has been incorporated within ICS include: information systems strategy, electronic governance and e-business, computer aided product design, information systems consultancy projects, and professional issues. ESD could be incorporated into a computer ethics curriculum. IT people need broader social and business skills too and these are the skills that will help them "stand out from the
crowd". Sustainability will be increasingly important and there are many business and IT opportunities in making the world more sustainable.

Sustainability also falls within ethical and environmental health and safety, BCS Code of Conduct, resourcing development, licence vs. Open Source software and sustainability strategy. A theoretical model based on IS practice as a holistic endeavour involving balanced attention to technical or environmental factors, social or empowerment factors and organisation or economic factors, is also offered where the notion of the “triple bottom line” as an alternative to traditional business drivers suggested by sustainability thinking. It also matches the more established requirement to give balanced attention to information, IT and IS strategies as suggested by the literature on strategic IS, amended using an emergent humanistic approach.

IT is also important to provide students with the understanding and the need to align technology with their social context, so social systems design goes hand in hand with technical design.

It is important to make the content relevant to students' personal and professional interest. In terms of environmental impact, it is important to explore a variety of issues, including some of that mentioned - recycling, energy usage. We look at telecommuting, videoconferencing, ways in which technological infrastructure could be made to help with issues of global warming and other environmental issues but look at the impact the developing/maintaining and using the infrastructure has itself (energy use, non-recyclable materials). It can also be linked in to issues of globalisation (of economics, environment, scarce resources...) and digital divides mirroring other divides (wealth, power, water).

Teaching methods employed to provide a greater understanding of sustainability as it relates to the discipline role play and scenario exercise as a means of getting students to become familiar with sustainable development issues. In general, students are taught a responsible approach to long-term holistic thinking in IS practice, which puts human endeavour at the centre of attention, and takes a critical view of the solutions-focused technocentric approach that dominates the industry, and that (arguably) leads to the large-scale failures in systems projects that continue.
Long-term thinking needs to be a part of sustainability considerations and students need to reflect critically and self-critically on the entirety of the project, their response to it and their learning outcomes.

It is important for students to understand sustainability as it relates to the business context many organisations are sensitised to or working on sustainability or sustainable development in one way or the other. Thus, students increasingly gain an appreciation of ESD issues and start to “think globally, act locally” themselves.

**Public Health**

We exist in a world that is closely connected to the health and welfare of people. This must not be forgotten as we strive to enhance the learning of students in higher education who will have a vital role to play as members of professional teams who make a major contribution to the health of the population. Legislation, funding and the management of the health service makes different demands in different regions. Our Health systems have four functions: health promotion, disease prevention, treatment and rehabilitation, all of which have a direct influence on people and their demands of practitioners.

Sustainability Literacy can be integrated into the Health Science Discipline using the following issues: health and social care context, service users’ rights, equality and diversity, codes of conduct, ethics and the law, user-centred service, health and safety, risk assessment. Communication skills and teamwork, ethics and legal aspects of health and healthcare, inequalities and the determinants of Health, reflective and evidence-based practice, health policy and its impact on practice, client/patient experience and perspective, complementary health systems interface / holistic health and healthcare, sociology of health and illness.

Learning and Teaching issues in Health Sciences and Practice include Lifelong and work-based learning, problem-based learning, Diversity, including disabled students, ethnic minorities and culture & learning issues, Teaching multi-disciplinary groups, Evidence-based teaching.
Built Environment and Engineering

The growth and importance of sustainability within the built environment is undeniable. To keep up with industry demand, construction, engineering, surveying etc education programmes must incorporate courses in sustainability, so that their students will be able to participate and be valued in the workplace. This does not simply mean introducing environmental education; it means embracing the concept of sustainability as a process; one which starts well before construction (in the planning and design stages) and continues long after the construction team have left the site: a process that takes in the design, construction and on-going maintenance of what is being referred to as a ‘green’ building (Hayles and Holdsworth, 2005).

Thus students in the field of the built environment and engineering must be educated with a ‘whole building’ mentality so they can realise the interrelatedness of building components in lieu of the current method of teaching compartmentalised information applicable only to constructors. Education now includes teaching sets of principles that describe both the personal attributes of the student and the nature of their actions. This approach enables students to analyse their professional approach and the reasons for the decisions they make as professionals. Within the built environment and engineering education the degree to which a student has embodied these principles will be demonstrated through their understanding of a number of key concepts. Students must also learn tools and methods that allow them to demonstrate that they understand the concepts, and apply them in problem contexts to solve resource and environmental problems.

BUSINESS/ MANAGEMENT/ECONOMICS
Sustainability as a concept has been dominated by theoretical rhetoric within much business management literature and policy instruments. However, only a handful of organizations have fully grasped the fundamental paradigm shift required within production models and organizational designs to lead their organization towards more sustainable operations. While efficient processes, marketing, technology and resources are all important; sustainability in every industry requires that organizations build capacity and resiliency for ongoing change. A sustainable competitive advantage can only be achieved through strong leadership and human resources. However, there has been little emphasis placed on how organizations can change the thinking, assumptions, and behaviours that are often the root causes of
unsustainable practices. Education within the business, management and economic discipline needs to challenge students to rethink current business practice to inspire ‘change leadership’.

This type of change requires a critical perspective and presents a challenge for business, management, economic education. There is discomfort and resistances to critical management education at the student, teacher and institutional levels. This may be due in part to a potential for critical frameworks to disempower and alienate (Cunliffe, 2002). The overtly political and polemic nature of critical perspectives can be perceived as anti-organisation by some of the stakeholders. Hence the challenge in teaching sustainability in these disciplines requires students to think critically about some of the assumptions they take for granted. Areas of content within the disciplines that include sustainability focus in the complexity of ecological, socio-political and ethical issues for individuals, organisations and society at large. Students therefore need to participate in dialogue about its inherent tensions and complexities. Concepts that could be covered in the course include; setting the scene mapping the sustainability domain/definitions/historical perspective; engaging with sustainability: requisite learning and research including critical thinking and action research, appreciative inquiry; the individual and sustainability the psychological and spiritual dimensions of sustainability; towards sustainable business practice; partnering for sustainability and environmental sustainability issues. Seminars and lectures, including guest lecturers from industry. Students are to be involved in participate in group discussion and activities exploring issues raised in the lectures and readings.
Barriers and Opportunities to the development of sustainability literacy in HE curricula

What, if any barriers do you see to incorporating sustainability in your courses?

- “Single modules cannot do justice to the subject and may be preaching to the already converted.”
- “If ‘sustainability’ becomes an explicit course ideal it might alienate some. Additionally, there is a danger of students feeling that values are being forced on them rather than allowing them to explore and define their own values.”
- “The topic is large and is in competition with other issues that need to be integrated into an already full and rich curriculum.”
- “Opposition to sustainability by staff is often encountered when you add a sustainability element into existing curricula. When you introduce something new it must replace an existing subject, and staff often resist this because it takes time, and is an area they need to educate themselves in. The biggest challenge is to get colleagues on side.”
- “The greatest barrier has been in the past limited staff experience in the field of sustainability. This has tended to focus narrowly on issues such as recycling, appreciation of nature, or energy conservation, without considering the fuller picture of the interaction of human social and cultural systems with natural systems.”
- “Insufficient student uptake to make it economically viable.”
- “Antagonism within traditional departments of universities.”
- “Not a lot of support exists within the school for library provisions.”
- “Lack of scientific knowledge in both staff and students or too much specific scientific knowledge to see the bigger picture.”

What, if any opportunities do you see to incorporating sustainability in your courses?

- “Students are sometimes surprised that a module on spirituality has a global/sustainability dimension. This can be a real opportunity for learning as it challenges their preconceptions.”
- “There are plenty of opportunities mainly related to ethics and behaviours, which is fundamental to the development of courses on sustainability issues.”
- “I think students are generally interested in questions about human relations with the environment and the natural world, and thus are interested to see how
literary modules might respond to the questions that are facing us on a daily basis. In this sense, sustainability might make courses more popular.”

- “We believe that University students are aware of socio-economic and ethical issues including sustainable development. However, they see these issues as outside their degree programme. To combat this we attempt to weave ethical and global issues such as sustainable development into the existing degree programmes in a variety of ways including lectures, tutorials and workshops. We believe the subtle weaving in of ‘real world’ issues is an effective way of getting students to place those issues in to context with the world they are going to be living and working in.”

- “Appropriate for global employability and enhances the very skills that HE seeks to develop.”

- “Links between sustainability governing bodies and professional bodies such as the NHS. This higher profile should make it more possible to integrate sustainable development into curriculum.”

- “HEA support.”

References


Knight, P. (2005), Opinion: the funding council circular on sustainability is pernicious, shameful and dangerous, says Peter Knight. Education Guardian (The Guardian), 8th February 2005.


## Appendix M: Forum for the Future Appraisal Grid and 12 Features

### Sustainability Appraisal Grid

<table>
<thead>
<tr>
<th>Name</th>
<th>What can be done to maintain or enhance the ‘stock’ of the following resources, or ‘capitals’</th>
<th>Three ways in which a university ‘manifests’ itself</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NATURAL</strong></td>
<td>The resources and services provided by the natural world</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. Use resources efficiently</td>
<td>1. Use resources efficiently</td>
</tr>
<tr>
<td></td>
<td>▪ Reduce energy and raw material use</td>
<td>2. Develop the new economy</td>
</tr>
<tr>
<td></td>
<td>▪ Drive waste out of the system</td>
<td>▪ Exploit teaching, research, business development opportunities in low-carbon, high human creativity economy</td>
</tr>
<tr>
<td></td>
<td>3. Conserve, enhance the environment</td>
<td>3. Conserve, enhance the environment</td>
</tr>
<tr>
<td></td>
<td>▪ Subscribe to low impact travel schemes</td>
<td>▪ Increase biological mass and diversity (on campus and locally)</td>
</tr>
<tr>
<td><strong>HUMAN</strong></td>
<td>The energy, motivation, capacity for relationships, and intelligence of individuals</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. Attract and keep good staff</td>
<td>4. Attract and keep good staff</td>
</tr>
<tr>
<td></td>
<td>▪ Create community of purpose for staff, students, other stakeholders</td>
<td>5. Provide good student experience</td>
</tr>
<tr>
<td></td>
<td>▪ Be a values led organisation</td>
<td>▪ Be a values led organisation</td>
</tr>
<tr>
<td></td>
<td>5. Provide good student experience</td>
<td>▪ Ensure healthy working culture and environment (a new</td>
</tr>
<tr>
<td></td>
<td>▪ Mix on/off campus learning experiences for both students and community</td>
<td>▪ Mix on/off campus learning experiences for both students and community (work-based learning)</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>----------------------------------------</td>
<td>------------------------------------------</td>
</tr>
<tr>
<td>The social groupings that add value to individuals (e.g. families, communities, parliaments, universities)</td>
<td>Ensure clarity and coherence in strategic planning and well trained managers</td>
<td>Articulate and meet 21st century challenges through teaching, research, knowledge transfer</td>
</tr>
<tr>
<td></td>
<td>Modernise charters, decision-making systems to ensure transparency and democracy</td>
<td>Promote a vision of future that engages new generations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Prepare graduates for multi-disciplinary approaches to problem solving</td>
</tr>
<tr>
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</tr>
</tbody>
</table>

- Ensure healthy working culture and physical environment
- Be active on diversity
- ‘conviviality’ quotient
- Enhance employability of graduates
- Ensure sustainability literacy for all
- Clear learner paths in and out of HE – from school, FE, work, non working
<table>
<thead>
<tr>
<th>MANUFACTURED</th>
<th>FINANCIAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>The ‘stuff’ that exists already – buildings, railways, etc. Can it be used in a way that requires fewer resources and more human creativity?</td>
<td>The money, stocks etc., that enable us to put a value on, and buy and sell, the above resources</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>10. Demonstrate best value in use of estates</th>
<th>11. Excellence in research and teaching</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ensure building design, refurb, all estate management is best practice for purpose and for environment</td>
<td>Integrate student learning with campus improvement, and community experience</td>
</tr>
<tr>
<td>Forge local partnerships (eg renewable energy generation)</td>
<td>Sustainability research/consultancy</td>
</tr>
<tr>
<td></td>
<td>Encourage innovation for sustainable design solutions</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>12. Promote community relations, outreach</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share sports, library, other facilities</td>
</tr>
<tr>
<td>Build portfolio of joint ventures for student, staff and local residents</td>
</tr>
<tr>
<td>Sustainable transport partnerships</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>13. Save money/be efficient</th>
<th>14. Compete internationally/regionally</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use whole life costing</td>
<td>Structure internally and make relationships to facilitate ideas-innovation-implementation process</td>
</tr>
<tr>
<td>Invest ethically (eg pensions)</td>
<td>Export models and programmes</td>
</tr>
<tr>
<td>Provide incentives for adding value to physical resources</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>15. Modernise risk management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Report on environment and social impacts as well as financial</td>
</tr>
<tr>
<td>Use procurement strategies to support local markets and ethical trade</td>
</tr>
</tbody>
</table>

Forum for the Future 2004a pg 60
### 12 Features of a sustainable future

<table>
<thead>
<tr>
<th>FEATURE</th>
<th>Does the initiative …</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. NON-RENEWABLE RESOURCES</td>
<td>reduce use of non-renewable resources? (e.g. oil, minerals, aggregates)</td>
</tr>
<tr>
<td>2. ARTIFICIAL SUBSTANCES</td>
<td>reduce use of artificial substances? (e.g. chemicals, plastics)</td>
</tr>
<tr>
<td>3. BIODIVERSITY / PRODUCTIVITY</td>
<td>conserve or restore biological environment? (e.g. use brownfield rather than greenfield sites, species diversity)</td>
</tr>
<tr>
<td>4. HEALTH</td>
<td>promote good health (e.g. air quality, food, exercise)</td>
</tr>
<tr>
<td>5. PARTICIPATION / LEARNING</td>
<td>promote learning or good social skills? (e.g. courses, information, self development)</td>
</tr>
<tr>
<td>6. WORK, CREATIVITY &amp; LEISURE</td>
<td>create jobs, encourage creativity or recreation? (e.g. paid/unpaid satisfying work, leisure)</td>
</tr>
<tr>
<td>7. GOVERNANCE &amp; JUSTICE</td>
<td>promote trusted governance and justice system? (e.g. equal opportunities, participatory democracy, transparency (at all levels)</td>
</tr>
<tr>
<td>8. VALUES &amp; SOCIAL COHESION</td>
<td>promote positive values and social cohesion? (e.g. community led initiatives, co-operative purchasing, credit unions)</td>
</tr>
<tr>
<td>9. SOCIAL INSTITUTIONS</td>
<td>represent positive institutional change? (e.g. policy, management systems and implementation)</td>
</tr>
<tr>
<td>10. SECURITY</td>
<td>promote safe, supportive &amp; convivial living and working environment? (e.g. security (on street, at work, international), pleasant surroundings (socially, physically))</td>
</tr>
<tr>
<td>11. INFRASTRUCTURE</td>
<td>demonstrate resource productivity (efficiency) and/or human innovation? (e.g. goods services produced with less resource input (no link to number 1))</td>
</tr>
<tr>
<td>12. VALUE OF MONEY</td>
<td>cause money to better represent value of human, social &amp; manufacturing capital? (e.g. ethical pensions, eco-taxes/levies, carbon sequestration, SD investment)</td>
</tr>
</tbody>
</table>
(Forum for the Future 2005a)
Appendix N: Activities undertaken by the HEPS program

The activities undertaken by Forum for the Future and the institution had four main strands of activity were undertaken these included:

- Sustainability reviews: to identify partners’ strengths and opportunities to change
- Individual work programmes: to help partners deliver their own objectives
- Partnership-wide initiatives: to develop tools and guidance for the sector
- Influencing strategy: to cascade learning to others and influence policy (Forum for the Future, 2004c. pg 3)

Sustainability Reviews
The sustainability reviews resulted in an assessment of the partner’s existing sustainable development activity. After the reviews were undertaken a report was produced which included a record of the drivers and barriers to change and a work programme for the staff see Table 6.1.

Table 6.1 Driver and Constraints to the implementation of sustainable development in UK HEIs

<table>
<thead>
<tr>
<th>Top five drivers to the integration of sustainable development into HEIs</th>
<th>Top five constraints to the integration of sustainable development into HEIs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. External drivers – eg legislation, NGOs, EU regulations, listed buildings, transport regulations</td>
<td>1. Lack of effective external drivers – eg lack of direction and legislation from central government</td>
</tr>
<tr>
<td>2. Individual champions within the institution</td>
<td>2. Lack of awareness of sustainable development and perception of issues as too complex</td>
</tr>
<tr>
<td>3. Potential to save money in the mid to long term</td>
<td>3. Lack of senior staff commitment and leadership</td>
</tr>
<tr>
<td>4. Pressure from students</td>
<td>4. Academic and operational culture are too segmented to embed sustainable development effectively</td>
</tr>
<tr>
<td>5. Need for better community relations</td>
<td>5. Lack of time and money to devote to</td>
</tr>
</tbody>
</table>
Others drivers included better sustainable development purchasing options; senior staff support; enhanced reputation. While other constraints were negative culture; conflicting priorities; individual champions limiting work to their own vision (Forum for the Future 2004c).

**Individual work programs**

Forum for the Future developed training sessions for individual university departments and reviewed progress to embedding these programs in annual discussions with Vice-Chancellors of partner institutions. Individual partners were encouraged to develop their own initiatives on issues including curriculum development, procurement, resource efficiency and general estate management. Creating the framework for a cross-university sustainability group and embedding sustainable development into strategies were high priorities for partners. Other work covered curriculum design, resource management and community liaison. Pragmatic work programs also included a visioning process to see how each university could potentially contribute to sustainable development (Forum for the Future 2004c).

**Partnership wide initiatives: Events and Seminars**

Forum for the Future held events and seminars that were open to non-partner institutions as well as partners. Leading sustainability experts in education, representatives from local and regional government, professional bodies and business also participated, as did sector organisations, government departments, environmental associations and further education institutions. In addition, Forum organised training sessions for individual university departments, annual discussions with all Vice-Chancellors and presentations of sector bodies. Seventeen seminars were held across the country, attracting over 500 delegates, and each one posed challenges and problems alongside sustainable development frameworks for solutions. Delegates who arrived with minimal knowledge about the issues were by the end involved in proposing
solutions which they could then go to implement. The role of these workshops was to improve capacity.
**Appendix O: Forum for the Future Curriculum Design Toolkit**

The curriculum design toolkit comprises seven steps to curriculum design that seek to integrate sustainability into the content and delivery of both existing and new courses.

**Curriculum design toolkit**

<table>
<thead>
<tr>
<th>STEP</th>
<th>OUTCOME</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Mapping the learner’s world and establishing a relationship profile</td>
<td>The key relationships the learner will have to maintain in the world of work and life once they have graduated are identified.</td>
</tr>
<tr>
<td>2 Making ethics and values explicit</td>
<td>The ethical framework and set of values that shape the course is made explicit in relation to both content and teaching approaches.</td>
</tr>
<tr>
<td>3 Determining sustainability competencies</td>
<td>A set of sustainability competencies relevant to the course (and the eventual world of the graduate) is identified – some in relation to the specialism of the course, some transferable.</td>
</tr>
</tbody>
</table>
| 4 Identifying learning outcomes and specific knowledge, understanding and skills and assessment procedures | The level of the course, in relation to degree of competence, is set, (including compliance with any professional standards that may be relevant) and the learning outcomes are drawn up.  

The knowledge and skills students need to achieve the learning outcomes are identified, either in advance, or by teachers or students together and assessment procedures are set. |
| 5 Deciding on the best delivery methodology | An appropriate delivery method is selected and tailored to the type and level of course and the style of learner(s).                                                                                      |
| 6 Promoting the course                    | Prospective students understand the relevance of and are attracted to a course that provides knowledge, understanding and skills relating to sustainable |
Step 1 Mapping the learner’s world and establishing a relationship profile

This tool was designed to map the key relationships that the learner will have to maintain in the world in which they will be living and working once they have graduated. It consists of concentric circles, with the most important relationships for the learner at the centre, working outwards to less central (but still important) relationships. Mapping relationships helps course designer understand not only the disciplinary/technical skills the graduate requires but, also the transferable skills, such as communication, team working, or business awareness.

MAPPING THE LEARNER’S WORLD
Step 2 Making ethics and values explicit

Forum for the Future argue that “ethics and values in the context of learning for sustainable development, two perspectives need to be taken into consideration:

- the ethics and values embedded in the course itself
- the ethics and values of the institution offering the course and the way it is taught.” (2004a, p34)

They believe that students have a right to understand the ethics that inform both of these, and therefore suggest that two steps be following in the creation of new material:

1. When developing new course material Forum for the Future advocates for participants to think about their own position:
   - How do you define ethics?
   - Which ethical principles do you try to live by?
   - To what extent do you find that your ethics and values are supported or not supported by contemporary society?
   - Have your ethical principles and values ever changed significantly throughout your life? If so what prompted that change?
   - Do you think we have any ethical responsibilities to the non-human world? (2004a, pg. 36)

2. To check whether a course is being delivered in a way that complements the agreed values of the institution and learners. The values below are those of Forum for the Future.

Note the contribution of the course to a particular value (1-5) and then identify a suggestion for the course to improve the score.
<table>
<thead>
<tr>
<th><strong>Does this course motivate staff and students to...</strong></th>
<th><strong>Score (1-5) and suggestion for improvement</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Commitment and co-operation</strong></td>
<td></td>
</tr>
<tr>
<td>Take the opportunity to realise their potential</td>
<td></td>
</tr>
<tr>
<td>Inspire and motivate each other</td>
<td></td>
</tr>
<tr>
<td><strong>Respect and integrity</strong></td>
<td></td>
</tr>
<tr>
<td>Appreciate and celebrate the interconnectivity of human, social and natural systems.</td>
<td></td>
</tr>
<tr>
<td>Value the richness brought to learning by diversity of cultures, backgrounds, opinions and ideas</td>
<td></td>
</tr>
<tr>
<td>Work in an environment in which people feel able to express differing views openly.</td>
<td></td>
</tr>
<tr>
<td><strong>Fairness</strong></td>
<td></td>
</tr>
<tr>
<td>Promote the principles of equity and justice</td>
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<tr>
<td><strong>Honesty and openness</strong></td>
<td></td>
</tr>
<tr>
<td>Recognise mistakes and learn from them.</td>
<td></td>
</tr>
<tr>
<td><strong>Compassion</strong></td>
<td></td>
</tr>
<tr>
<td>Be mindful of the effects of their actions on each other and on their environment.</td>
<td></td>
</tr>
</tbody>
</table>
Have fun. Appreciate humour and create an enjoyable and friendly working environment.

Forum for the Future 2004a, pg 56

VALUES AUDIT TABLE
1. Note the values that the students and staff feel should be incorporated into the way the course is delivered.
2. For each value note the actions that students and staff could take to help promote this value.
3. Give a score for how you are doing now (1-5) and make a suggestion for improvement.
4. Revisit your values and actions as often as appropriate.

<table>
<thead>
<tr>
<th>Value:</th>
<th>Action:</th>
<th>Score (1-5) and suggestion for improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</tbody>
</table>

(Forum for the Future 2004a, pg 57)
Step 3 Determining Sustainability Competencies

Forum for the Future believe that learning outcomes and establishing relevant sustainability competencies are directly linked. Sustainability competencies are linked to what graduate who are sustainability literate are able to achieve and these will have professional specialist and transferable elements as well as personal elements. Forum for the Future (2004, pg 37-38) suggest the following process to determine relevant sustainability competencies.

1. Starting from the learner’s relationship profile and any work on ethics and values already to hand, classify the key relationships into professional and personal.

2. Take into account the level of competency and any associated professional standards involved.

3. For each relationship, use the Sustainability Competencies Matrix to identify the competencies needed (what the graduate should be able to do) to maintain relationships to an appropriate professional standard, whilst maintaining and enhancing the resources on which we depend to progress to a sustainable way of life.

4. Start with the professional specialist aspect of the relationship (eg understanding principles of eco-design), then the professional transferable competencies (eg knowing about contracts and agreements), and, finally, the personal elements (eg interpersonal skills, recognising the importance of a good life/work balance in self and others).

5. As more relationships are analysed, some competencies are repeated. Although laborious the first time this is done, the reward will be greater ease in writing the learning outcomes and the defining knowledge, understanding and skills for the course. This analysis will also be a significant resource for advertising the course to students and potential employers alike.

6. It is recommended that sustainability competencies – like the learner relationship profile – are defined in partnership not only with learners, but also with working graduates of the course and their employers.

7. Rationalise and prioritise the output of this process – which will be a menu of competencies. Apply the ‘at the same time’ rule continuously, and keep sight of those competencies that are common to a number of different relationships and are therefore most likely to be transferable.
To assist with the development of competencies Forum for the Future suggest completing the sustainability competencies matrix

What should a graduate be sufficiently good at or able to do to manage the relationships in their sphere of influence in a way that maintains or enhances the resources or capitals available to us?

<table>
<thead>
<tr>
<th>The five sets of resources (or capitals) that need to be in good shape to deliver a flow of benefits.</th>
<th>Competency</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENVIRONMENTAL CAPITAL</td>
<td>The resources and services provided by the natural world.</td>
</tr>
<tr>
<td>HUMAN CAPITAL</td>
<td>The energy, motivation and capacity for making relationships, and the intelligence and health of individuals.</td>
</tr>
<tr>
<td>SOCIAL</td>
<td>The social groupings that add value to individuals (eg families, communities, parliaments, universities).</td>
</tr>
<tr>
<td>MANUFACTURED CAPITAL</td>
<td>The material and infrastructure that exists already – buildings, railways etc. Can it be used in a way that requires less resources and more human creativity?</td>
</tr>
</tbody>
</table>
### FINANCIAL CAPITAL

The money, stocks etc that enable us to put a value on, and buy and sell, the above resources. Are there ways that value can more accurately represent the real cost of using them?

(Forum for the Future 2004a, p59)

#### Step 4: Identifying learning outcomes and specific knowledge, understanding and skills and assessment procedures

Once the competencies have been established they are translated into learning outcomes. This needs to consider specialist aspects, the level at which it is to be pitched, professional standards that need to be met. Additionally, knowledge, understanding and skills to be covered are identified, as are the assessment procedures. The learning outcomes related to sustainable development should be embedded and expressed in the same style as other learning outcomes for the course. Assessment should follow current best practice with its emphasis on formative feedback, rewarding rigorous analysis, multiple forms of assessment (peer, self, written, oral, presentation).

#### Step 5: Deciding on the best Delivery methodology

Forum for the Future suggest that course designers using this guide will have a range of teaching skills and will be able to draw on resources either in their institution or professional association. But, additionally refer to the work of by Polly Courtice, Director of the Cambridge Programme of Industry and the report by the Cambridge Programme of Industry to research how people learn. 17

#### Step 6: Promoting the course

Forum for the Future argue that time and effort needs to be dedicated to effective promotion of the course, not only to attract students who may be searching in the traditional locations but also to keep all those involved in delivering the course engaged

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Communicating for sustainability

Forum for the Future suggest the following communications strategy are particularly helpful when thinking about promoting your course. The steps below give some tips on how to do this.

"Step 1  Aim – what is the overall objective of your communication?
As with marketing any course, the overall aim is likely to be to recruit students. However there may be other objectives, such as demonstrating to funders how your institution is contributing to sustainable development, or highlighting the links between research and teaching.

Step 2  Markets – who are you saying it to?
Consider that the course may attract students from a variety of backgrounds, which means that you may need to cast a wider net when marketing, and monitor where your students come from each year. Introductory modules tailored to different disciplinary backgrounds may be needed to bring students from single disciplinary backgrounds up to the same level, particularly with postgraduate courses.

Step 3  Messages – what are you saying?
Sustainability literacy is about being equipped to live and work in an ever changing world. Highlighting the employability benefits of the course is useful, but don’t underestimate the values of those students who are driven by a desire to make a difference to society. Making links with the university’s own sustainability strategy can also be useful.

Step 4  Methods – how are you saying it?
A combination of the usual communication channels such as prospectuses, newspapers, websites, course catalogues and posters should be complemented with informal techniques such as word of mouth or, for example, using the campus as a live
case study in the course. Remember to minimise resource use, maximise innovation, be accessible, cost effective and stay true to the values of the course.

Step 5  Measurement – did the communication work and how can it be improved? Ask employers and graduates how effectively they felt the course was promoted. Being on top of changing trends in the relevant industry and new communications channels will not only keep the course up to date but also help with getting the right messages to the right people.

For further details and examples of good communication for sustainability see Communicating for sustainability. Guidance for Higher Education Institutions (HEPS 2003) available from www.heps.org.uk.” (Forum for the Future 2004a, pg 45)

**Step 7: Reviewing and renewing THE course**

No course should remain static. Whatever the subject or discipline, the relevant knowledge, understanding and skills are always changing through new research outcomes or insights as well as the inevitable changes in the world and in society itself. A framework for reviewing a course for its sustainability competencies is presented on pg 50.

<table>
<thead>
<tr>
<th>STEP (WITH SYMBOLS)</th>
<th>REVIEW QUESTIONS BASED ON THE DESIRED OUTCOMES OF EACH STEP</th>
</tr>
</thead>
</table>
| 1 Map the learner’s world and establish a relationship profile | • Is the world map for an ‘average’ graduate of this course still the same?  
• Are there any new relationships to add to the profile? |
| 2 Make ethics and values explicit | • Is the course delivered in a way that is compatible with the values made explicit at the outset – in what the course teaches, as well |
| 3 | Identify sustainable development competencies | • Were the sustainability competencies adequately derived from the learner relationship profile for:
  • Professional specialist needs
  • Professional transferable needs
  • Personal needs |
| 4 | Identify learning outcomes and specific knowledge, understanding and skills | • Were the learning outcomes relevant:
  a) For the level of the course?
  b) In relation to the competencies?
  c) In relation to the knowledge, understanding and skills?
  d) In relation to the assessment procedure?
 • Were the knowledge, understanding and skills sets right:
  a) For the learning outcomes?
  b) In relation to the competencies?
 • Did the assessment procedure fit logically with the learning outcomes and the learning methods, professional and other quality standards? |
| 5 | Decide on the best delivery mechanism | • Was the learning process of the course effective overall?
 • Were the different elements |
|   |   | mutually reinforcing?  
|   |   | • What approaches worked well and not so well?  
| 6 | Promote the course | • How did the students find out about the course?  
|   |   | • What (if anything) in the published material (written, web) attracted students to apply?  
|   |   | • How do employers, graduates and others view the course’s contribution to sustainability literacy?  
| 7 | Review and renew the course | • Was the outcome of the previous review incorporated into the course appropriately?  
|   |   | • Are the above questions and processes adequate to reviewing and renewing the course and how might they be improved?  
|   |   | • Are there other courses to compare with, or new people to include in the review process?  
|   |   | • Is there any way the course itself, and/or the design and review process, might help others to stand on the shoulders of our experience and quickly move to producing sustainability competent or literate graduates themselves? (In the UK or overseas.)  

(Forum for the Future 2004a, pg. 50)

Forum for the Future’s project work within the higher educational sector formally began in 1997, with the Higher Education 21 (HE21) program. The HE21 program was funded by the UK government, its objective was to work with 25 institutions to identify and promote examples of best practice for sustainability in the HE sector (Sterling & Scott, 2008). The objectives were then continued in the Higher Education Partnerships for Sustainability (HEPS) program which developed partnerships with 18 universities that had made the commitment to sector leadership, and who were ready for a comprehensive and strategic engagement with a programme of change to a more sustainable way of operating. The HEPS program was funded by the HEFCE.

Sustainable development education first became a policy agenda in 1993, when The Committee on Environmental Education in Further and Higher Education produced a report: Environmental responsibility: An agenda for further and higher education (HMSO 1993). Subsequently, in 2003 the Department for Education and Skills (DfES), responsible for education policy in England, produced a Sustainable Development Action Plan for Education and Skills (http://www.dfes.gov.uk/aboutus/sd/action.shtml). It was organised around four objectives concerning the curriculum, the impact of the department and its partner bodies, the impact of the education estate, and local and global partnership activity.

In 2005 the UK Government launched its strategy for sustainable development, Securing the Future, the UK Sustainable Development Strategy (HMG 2005). The strategy aimed “to enable all people throughout the world to satisfy their basic needs and enjoy a better quality of life, without compromising the quality of life of future generations.” and took account of developments since the 1999 Strategy, ‘A better quality of Life – a strategy for sustainable development for the United Kingdom’, (Defra 1999) additionally it highlighted the renewed international push for sustainable development from the World Summit on Sustainable Development in Johannesburg in 2002. The Strategy placed greater emphasis on delivery at regional level and the new
relationship between government and local authorities with devolution to Scotland, Wales and Northern Ireland. *Securing the Future* (2005) stated that:

Sustainable development principles must lie at the core of the education system, such that schools, colleges and universities become showcases of sustainable development among the communities they serve. The strategies, which are being developed following extensive processes of consultation, aim to encourage institutions within the college and university sectors to embed sustainable development within their teaching and learning, their management and leadership, and their engagement with the wider community. (HMSO 2005, p. 37)

The lead Department was the UK Department for the Environment, Food and Rural Affairs (Defra), but all UK Departments share responsibility for making sustainable development a reality (Defra 2005). The work of Forum for the Future in conjunction with Defra was reflected in this strategy, and is evidenced by adoption of the concept of ‘sustainability literacy’ as identified in the strategy document itself.

To maintain a more competitive economy, to compete internationally and build ourselves sustainable communities, we need to improve the knowledge and skills base of everyone, including professionals and others in the workplace. Later parts of the strategy set out how we are planning to upgrade public sector skills for sustainable development, help business with corporate social responsibility and develop a strategy for sustainable development in the workplace, but we need to make “sustainability literacy” a core competency for professional graduates. (Defra 2005, pg.39)

DfES is working with Forum for the Future to ensure sustainability is promoted across the spectrum of professional bodies. (Defra 2005, pg.39)

DfES is also keen that “Sustainability Literacy” becomes a core competency for professional graduates. DfES has, with Forum for the Future and professional organisations, set up the Sustainability Integration group to raise the profile of sustainability literacy in the professional curricula.’(Defra 2005, pg. 40)
The launch of this strategy required Higher Education Funding Council for England (HEFCE)\textsuperscript{18} to develop a SD strategy for itself and for the way it interacts with the HE sector, and was released in 2005. The Council produced a support strategy and an action plan. The support strategy sets out HEFCE’s vision for HE’s contribution to SD and, in broad terms, its approach to pursuing this vision. In October 2004, The Higher Education Academy (HEA) was launched to bring together the functions of the Institute for Learning and Teaching in Higher Education and the Learning and Teaching Support Network (LTSN’s)\textsuperscript{19} generic centre and its subject centres, which remain as a network of 24 different disciplinary centres. One strand of activity was the funding of individual subject centre projects to:

- build awareness and understanding of the principles of sustainable development (SD) in the context of each discipline,
- research current ESD practice,
- unearth existing and/or develop new learning and teaching resources, and
- identify opportunities for further development and propose outline work programmes for 2005/06 and beyond.

The HEA’s remit was to “enhance the student experience” (HEA 2009, np). The HEA was expected to help deliver HEFCE’s sustainable development strategy and action plan. The HEA over 2004/2005 funded a programme of work to the value of £100,000 in preparation for activity over the following five years. The preparatory phase aimed to:

- Raise awareness and understanding of the principles of sustainable development across the subject centre network
- Develop a shared understanding of education for sustainable development and the role of the subject centres in supporting its integration at institutional/department level

\textsuperscript{18} The Higher Education Funding Council for England (HEFCE) is a non-departmental public body which distributes money provided by the Government to institutions carrying out higher education teaching and research. It is responsible for monitoring the financial health of such institutions and has a role in ensuring quality and good practice (Katayama & Gough, 2008).

\textsuperscript{19} The LTSN Generic Centre’s mission was to broker information and knowledge to facilitate a more co-ordinated approach to enhancing learning and teaching. The Generic Centre has four main project areas: assessment, employability, e-learning, and widening participation. The site provides a number of resources including circulars and newsletters, and a resources database http://www.library.qut.edu.au/services/teaching/guide/websites.jsp
• Survey the extent and nature of current ESD at subject level
• Develop/collate resources pertinent to ESD at subject level
• Raise the profile of the ESD agenda across the sector
• Provide the evidence base upon which our future work will be structured
• Devise a strategic plan for the next five years. (Forum for the Future 2005b, pg.4)

The preparatory phase consists of:
• Staff development and networking events
• Subject centre development projects
• Baseline research project to provide the evidence base for future work, explore current models of best practice and highlight useful resources. (Forum for the Future 2005b, pg.5)

Forum for the Future worked closely with HEFCE and the Higher Education Academy to develop programs and initiatives that supported the development and achievement of these aims. The HEA has also commissioned two related strands of work dealing with sustainability in the curriculum the ‘Embedding Education for Sustainable Development (ESD) in higher education, and a series of ‘Subject Centre ESD Development Projects’ to be carried out by some of the 24 Subject Centres supported by the HEA. The HEA created an Education for Sustainable Development (ESD) Planning Group, and this body, in conjunction with Forum for the Future, developed a ten-year strategic plan to embed ESD into the activity of the Academy and its Subject Centres. A short-term operational plan was also devised, in accordance with this strategy, the first phase of which was a pilot programme recently completed academic year 2004-2005.

In 2005, the HEA subject centres initiated an ESD project in response to HEFCE’s request that HEA should take the lead in efforts to embed ESD in the HE curriculum (Sterling & Scott 2008). In addition the HEA’s ESD Project’s work has included:
• Commissioning and publishing a report on the status of ESD in HE (Dawe, Jucker, & Martin 2005).
• Commissioning research from Forum for the Future on the policy context relating to ESD in the UK.
• Holding a seminar series on ESD and interdisciplinarity.
• Initiating small ESD research and development projects in eight HEIs.
• Commissioning the development of a generic Teaching and Learning Framework for ESD in HE, and a generic module. (Sterling & Scott, 2008).

HEFCE also funded two ‘Centres for Excellence in Teaching and Learning’ with five-year programmes to advance SD within and beyond their institutions. These include the Centre for Sustainable Futures (CSF) at the University of Plymouth (http://csf.plymouth.ac.uk/) and the Centre for Sustainable Communities Achieved through Professional Education (C-SCAIPE) at Kingston University, London (http://www.cscaipe.ac.uk/).