A Process for Transition to Sustainability: Implementation

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Abstract This paper reports the outcomes of the second action cycle of an ongoing project at Edith Cowan University (ECU) called *Transition to Sustainability: ECU South West* which is located in a small, single faculty regional university campus. The overall project has comprised three action research cycles, the first of which was the planning cycle which established the importance of building a community of practice with a learning stance for sustainability transition. It also highlighted the issue of a common definition of the term sustainability; of including cross-disciplinary perspectives; and of working with the local community. The second action cycle which was the first implementation phase, is the subject of this report. In this phase, we found that by not foreclosing on the meaning of sustainability, important aspects of sustainability were included. Although research participants initially expressed some concern about using an open understanding of sustainability, the problem of the meaning functioned to foster involvement in dialogue. In fact, these ongoing discussions around sustainability and the notion of a sustainable future formed the heart of this action cycle. However there were constraints associated with the subject of dialogue. These included problems of site communication, the maintenance of effective networks and issues around power and authorisation. We observed that each of these elements could work together in ways that enrich and/or obstruct a transition to sustainability. Finally, we found that lack of time hinders participation in sustainability transition projects because of its effect on authentic dialogue, thereby impacting upon the development of collaborative ways of working within the university. Our project is distinctively Australian in that it reflects an emerging movement in Australia to create social frameworks for embedding sustainability education activities. In our project, the transition process by which learning and change has been facilitated comprises the action research itself.

Introduction

This paper reports the outcomes of the second of three action cycles of an action research project undertaken at the South West campus of Edith Cowan University (ECU); a small, single faculty, regional campus located in Bunbury, Western Australia. The first action cycle comprised the planning phase, whereas this second cycle was the first

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implementation phase of the research. An earlier paper (Wooltorton, Palmer, Goodwin, & Paine, 2010) contextualised the project in the literature, described the background of the project and presented the findings of the first action cycle. That phase of the project identified the importance of building a community of practice and the significance of developing a learning stance for sustainability transition. It highlighted the need to work to develop a local understanding of the term sustainability; the necessity to engage with the local community and the desire to relate more deeply with the local and built environment. The significance of working in ways which incorporate cross-discipline perspectives was also identified. Whilst the outcome of the first action cycle was the identification of the process and design for the project, this current paper reports on the initial implementation cycle.

The main intention of the project has been to reorient the curriculum to sustainability across the seven program groups which make up the faculty: Business, Computer Science, Creative Industries, Education, Nursing, Social Work and Coastal Environmental Science/Surf Science. Specifically, the goals of the research described here have been to:

- Plan the reorientation of the faculty to sustainability in terms of the content (curriculum) and processes of teaching and learning;
- Use Action Research as a methodology to achieve the necessary ongoing learning and to frame the reports on the project findings; and
- Begin building the social sustainability framework.

Teaching, learning and research in the field of sustainability education[1] have a history of more than a decade at the campus, which has hosted a number of sustainability education research and development projects. The campus is located in a region of Western Australia known as Australia's only biodiversity hotspot and the university is the custodian of 80 hectares of natural bushland. For these reasons, the Faculty of Regional Professional Studies has been well placed to undertake this research into transition to sustainability.

The key aims of this ongoing project are distinctively Australian in that they are part of a nascent movement in Australia to create social frameworks to anchor sustainability education programs. The project is innovative in that our transformative approach is underpinned by community development knowledge and principles (Ife & Tesoriero, 2006). Given the nature and location of our faculty we have had an opportunity to trial sustainability reorientation using a community resilience/community linking approach and in doing so build community among the staff and students. The project has also been based on a learning approach linked to sustainability initiatives in non-government organisations, schools, community networks and government departments in the town, region and nationwide (Wooltorton et al., 2010).

Australian Universities and Sustainability Education

Substantial research in the field of sustainability education has been implemented in universities in international contexts (for example Corcoran & Wals, 2004). There have been regular calls over the years to radically transform higher education in particular universities (for example Reason, 2002) and more generally in international contexts (for example Fadeeva & Mochizuki, 2010) in order to more competently address the sustainability education agenda. In relation to a double learning challenge which he calls "paradigm" and "provision" in higher education, three areas of concern for each university are identified by Sterling (2004). These are firstly that which already exists in relation to paradigm and provision; secondly that which is implied by sustainability in relation to paradigm and provision; and thirdly that which is required to shift

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both paradigm and provision for sustainability outcomes (Sterling, 2004). This paper addresses the third of Sterling's areas of concern. In the remainder of this section, aspects of the contemporary Australian university context for sustainability education are outlined, and some other sustainability initiatives in the higher education setting are introduced. Some of the issues pertinent to the current study are highlighted.

In 2009, *Living sustainably: The Australian Government's National Action Plan for Education for Sustainability (NAP)* (Department of the Environment Water Heritage and the Arts, 2009) was released. The NAP proposes a transformative approach to education, with the stated aim of "achieving a culture of sustainability in which teaching and learning for sustainability are reinforced by continuous improvement in the sustainability of campus management" (Department of the Environment Water Heritage and the Arts, 2009, p. 5). The NAP is part of Australia's contribution to the UN Decade of Education for Sustainable Development 2005 – 2014. UNESCO takes the view that: "We have to **learn our way out of** current social and environmental problems and learn to live sustainably" (UNESCO, nd) (our emphasis). The intention of the NAP is to reorient all education systems, at all levels, to sustainability through learning, which in most cases will require transformation of practices and structures.

The NAP bases education for sustainability on a number of defined principles:

- Transformation and change;
- Education for all and lifelong learning;
- Systems thinking;
- Envisioning a better future;
- Critical thinking and reflection;
- Participation; and
- Partnerships for change (Department of the Environment Water Heritage and the Arts, 2009, p. 9).

These principles were adopted by the Australian Research Institute for Environment and Sustainability (ARIES) and incorporated into "mainstreaming" which uses a complex systems approach to holistic change within the university setting. Projects to mainstream sustainability into pre-service teacher education, accountancy and MBA programs have so far been conducted (Ferreira, Ryan, Davis, Cavanagh, & Thomas, 2009; Steele, 2010; Thomas & Benn, 2009).

A whole-of-university approach to sustainability links research, education and operational activities together and engages students in these activities (Mcmillin & Dyball, 2009). For example, management and operations staff might engage all staff and students in a process to create a shared vision for the faculty (including the use of facilities and grounds) that encourages critical reflection and an opportunity for participation and dialogue. To support this and to overcome disciplines operating as silos, it is suggested that an interdisciplinary approach to planning and teaching the curriculum is needed (Paige, Lloyd, & Chartres, 2008; Sherren, 2006). Further, it is advocated that graduate attributes be developed that address the skills and competencies required for partnership, participation and action as well as those that enable graduates to critically enquire and think about problems and the associated complexities for a more sustainable way of living (Barth, Godemann, Rieckmann, & Stoltenberg, 2007; Fien, 2002; Sibbel, 2009). It is also vital that students acquire the ability to work with people from different cultures and backgrounds (Martins, Mata, & Costa, 2006).

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A number of universities have implemented successful projects to incorporate sustainability education. Five universities in Queensland and four in NSW were involved in a project to mainstream education for sustainability into pre-service teacher education (Ferreira et al., 2009; Steele, 2010). A whole-of-university initiative at the Australian National University (ANU) resulted in significant change on that campus (Mcmillin & Dyball, 2009). Similarly, the Royal Melbourne Institute of Technology (RMIT) undertook a project that sought to achieve lasting change in organisational structure/operations and curriculum content. The main aim of that project, *Beyond Leather Patches* (BELP) (Holdsworth, Bekessy, Peliwe, Hayles, & Thomas, 2006) was to provide practical guidelines for integrating the broad concepts of sustainability into a wide range of university courses while also gaining a deeper understanding of the methods needed to achieve curriculum and institutional change. To achieve this, the project coordinators ran a series of workshops that encouraged academics to take ownership of their respective practices, undertook a course audit and surveyed staff about their attitudes towards teaching sustainability (Holdsworth et al., 2006; Lang, Thomas, & Wilson, 2006). Initial outcomes from the project resulted in 16 courses being revised.

Another initiative, this time undertaken at the University of South Australia (Paige et al., 2008), was the development of a transdisciplinary unit incorporating science, mathematics and ecological literacy for pre-service teacher education. *Transdisciplinary* was defined as "interdisciplinary + participation" and required going beyond the current content of each unit (Paige et al, 2008, p. 24). The authors note that it would have been much easier to do the three units as separate subjects, but argue that delivering in this way is important for the long term reorientation of teaching towards a sustainable future. However reaching this level of integration of content and theory was found to be stressful and time consuming. This is not surprising; lack of time was also the most commonly cited reason for non-participation in sustainability actions in the pre-service teacher education study conducted by ARIES (Steele, 2010).

A number of issues confront many Australian universities and directly impact on their sustainability education capacity. One is that academic communities are expected to confront a shortage of academics within the next decade (Hammond & Churchman, 2008). This is because academic salaries fail to compete favourably with those in the private sector, therefore many universities are failing to attract highly qualified and suitable staff (Murray & Drollery, 2005). It is also because of increased casualisation (Hammond, 2011, p. 11). Additionally, high student-staff ratios (a result of increased student intakes in times of declining permanent staff appointments) compound this problem Australia-wide. Another issue is a perceived loss of opportunities for creativity and autonomy for research (Hammond & Churchman, 2008). This is explicated by Cooper & Poletti (2011) who argue that the process of journal ranking stifles collegiality, threatens international research networks and potentially erodes the socio-cultural role of academic journals. The overall audit and quality context is a factor in the decreasing capacity of academics to sustain academic life or nurture a social dimension of sustainability (Hammond, 2011).

Another constraint to building sustainability is establishing a shared meaning for the term so that mutual comprehension is possible when it is in common use among people working together. The problem of the meaning of the term sustainability has been alluded to earlier in this paper and will only be briefly outlined here. Internationally much work has been completed around pillars of sustainability to frame the transdimensional nature of the concept. Whilst they have been variously named by different authors for a variety of reasons, the biophysical, economic, social and political systems in conjunction with the inter-related principles of conservation,

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peace and equity, appropriate development and democracy (UNESCO, 2002, p. 8) provide an outline for beginning learners.

In terms of the Australian literature, Sherren (2007) found some agreement about a knowledge base for sustainability but more in the area of ecology than in the political, social and economic aspects of sustainability. Reid and Petocz (2006) found that university lecturers had varying and often narrow understandings of the term. Many held naive views such as "keeping something going" or recycling paper (Reid & Petocz, 2006, p. 120). Fuller (2010) argues that the word has become clichéd and urgently needs sharpening for students to understand that major changes to the ways we live and design buildings are needed. Accordingly he uses principles originally devised by Palmer, Cooper & van der Vorst (1997) comprising environment, participation, equity and futurity. Wals and Jickling (2002) suggest that talk around the meaning of sustainability can bring together disparate groups, creating dissonance and generating learning. It is this approach which has informed the current study.

Methodology

Action research, a strategy to link theory and practice using a cyclical process of planning, implementation, description and evaluation (Carr & Kemmis, 1986), has diverse applications (for example Grundy, 1995; Reason, 1988; Tripp, 2005). Action research is a way of researching collaboratively. For Grundy (1995), action research is about involvement (participation and collaboration) and the improvement of practices. Such improvement targets three areas: "improvement in practices; improvement in the situation in which practice is occurring; improvement in understanding both the practice and situation" (p. 9).

At the end of the first action cycle for this project, the researchers planned to establish a series of nested projects within a paradigm of transformative human inquiry (Heron, 1996) to progress the goal of finding out what works in transitioning the curriculum towards sustainability. The projects that were introduced, or continued from the first action cycle, were an art project; a student sustainability group; linkage to an emerging Transition Town (Hopkins, 2008) project ; a series of program-based focus groups and one faculty-wide reflective meeting. These projects aimed to build relationships amongst, and between, students and staff and between the campus and the local township.

The aim of the focus groups with staff from each of the seven programs was to collect data about their understanding of sustainability for their discipline area, and their thoughts on what might bring about a reorientation toward sustainability in their curriculum. As anticipated, each program had different understandings about the meaning and application of the concept of sustainability; meanings attributed to sustainability are influenced by the ways of working within that knowledge field. Thus debate continued as to whether multiple meanings of sustainability could be held at the same time, or whether the priority of the project should be to define the meaning more precisely.

Despite time limitations brought about by workload demands, 27 academic staff (68% of the program based academic staff) participated in the focus groups. Two meetings were held with each of the larger programs to allow more time for discussion and one meeting was held with each of the smaller programs. At each meeting a presentation was given to the groups detailing the aims and background of the project and illustrating sustainability through the four interconnected dimensions (or pillars of sustainability education): the biophysical, economic, social and political (UNESCO, 2002 p. 8). The presenters juxtaposed *sustainability* as an organising principle with *economic growth* (Trainer, 1989). Sustainability constructs acceptable to each program emerged from

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the group discussions, such as preventative health (nursing) and social justice (social work). By leaving the definition of sustainability open, staff could be creative when translating sustainability as an organising principle into their curriculum.

In terms of analysis of the primary data, notes from all meetings were coded and uploaded into QSR NVivo 8. Further analysis generated key categories and themes (Miles & Huberman, 1994). Once the initial categories were developed, all academic and senior staff were invited to reflect on the emerging themes. In brief, the function of the methodology was to facilitate the process, and as the next section shows, this eventuated.

Findings

From the outset, the researchers intended to use processes conducive to sustainability transition, and as far as possible, to work inside the paradigm that they wished to bring into fruition. Themes that emerged from the data were:

- Teaching between and across disciplines (transdisciplinary practice);
- Discourse;
- Communication strategies;
- Networking; and
- Shared and disparate meanings of sustainability.

It was apparent from the data that the ways the programs are linked have shaped the faculty's transition to sustainability. Within an overarching construct of transdisciplinary practice as defined by Paige et al. (2008) above, the other themes are outlined below, illustrated with extracts from the notes made at the program focus groups.

Discourse

A number of groups spoke about the importance of discourse in creating interdisciplinary ways of working. However, two meanings of discourse were evident and these reflect the way this term is used in different fields:

- Authentic dialogue (Habermasian); or
- "Permission to speak"(Foucaultian).

Participants highlighted the fundamental importance of authentic dialogue in order to bring about the desired outcome of sharing teaching and research.

> The problem of discourse was discussed in depth, including the problem of interpretations of meanings by disciplinary groups and therefore often contradictory assumptions by conversants with different backgrounds. Conversations underpinned by this problem have happened on campus in recent times, causing a rapid cessation of the conversation without the opportunity to explore and carefully investigate the construction of shared understandings. In other words, cross-program engagement can immediately halt without recognising the importance of clarifying these assumptions. (Researcher notes, focus group 1)

Increased opportunities for discourse (as authentic dialogue) involving clarification of meaning were called for. There was considerable discussion about the form this discourse should take:

> Take an approach to inter-program collaboration that focuses on mutual respect, critical inquiry and respectful argument. (Participant, reflective meeting)

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It was regarded as necessary to increase the dialogue between groups regarding the transition to sustainability project and one participant queried the rationale for conducting the focus groups within, rather than across, program teams.

There has been an ongoing question about whether the dialogue in meetings has been fully authentic, with one participant noting "elephants in the room" during the conversations. This comment related to an issue of staff reorganisation which took place during the action cycle and resulted in several redundancies. The idea that sustainability is linked to decision-making had been made prior to the staff reorganisation:

> Things would be more sustainable if the people involved in a work area make the decisions around it. The concept of subsidiarity relates to the idea that the people who do the work make decisions around it. Taking this idea to education institutions, the biggest groups involved, the teachers and students, have the least say in what they do. So – in our system the bigger the group, the less say they have about their workplace! (Participant, focus group 2)

Another participant suggested another way of looking at the notion of discourse:

> There was discussion about *warrants for participation*, and the issue of representation. For whom are we speaking? The importance of all materials being public was raised. (Name) spoke about the work by Charles Fox and Hugh Miller on warrants for participation. (Researcher notes, reflective meeting)

The idea to work with Fox and Miller's (1995) ideas about warrants for participation in discourse has been taken on board by the project team, and has been considered more fully in action cycle three.

During the reflective meeting open to all staff, one participant commented that she felt uncomfortable with the term "power", but was able to accept it when it was reframed as the capacity to bring about change through cooperative relationships. In that context, power related to having the capacity to control the content of units taught on the campus. The current situation in this faculty is that many units are *owned* by the larger faculties in Perth, and staff members are required to negotiate any changes to the unit outlines. Some staff felt this to be an impediment to change toward sustainability. Others felt that change could be made if dialogue was maintained with the parent campus and any formal policies and procedures about changing content adhered to. This view seems to suggest some faith in the idea of discourse as "authentic dialogue", which Hammond (2011) finds is an integral quality of social sustainability.

Communication

Although discourse is closely related to the theme of communication, here communication refers to the *means by which* interconnectedness can be achieved; the technologies of communication. Generally on the campus where this study took place there are few whole-of-staff meetings, conferences or retreats, yet people want to see *real things* happen:

> Staff wish to improve campus-wide communication, for example consultation with staff about vital decisions impacting upon resource allocation, cultural fixtures and staff working conditions. It is important for wellbeing that people feel valued and included. (Researcher notes, focus group 1)

One focus group also highlighted the importance of culturally sensitive communication for both staff and students. Another sub-theme to emerge was that of

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the importance of celebrating successes; for example, to provide a regular newsletter or an event at the end of semester that would showcase what had been achieved.

Networking

Related to the theme of communication are the concepts of networks and networking. As networks become bigger and more complex, communication can become a problem. Inter-group networks, community networks, and wider academic networks were all identified as important. In response to a question about what makes sustainability education, one focus group participant responded:

> We maintain and sustain relationships with schools. We maintain the work environment. We focus on relationships with each other, with schools and students, with other campuses of ECU. That is, as education is about relationships, so is our program. (Participant, focus group 4)

Similarly:

> (Name) also spoke about Cooper Ramos' (2009) work on being adaptive. In a nutshell, this work claims that in day to day work we pay attention to the fast variables that change, instead of the slow variables that are strategic and long term. It seems that this is the place that this sustainability project needs to aim for. Fast variables are such things as curriculum framework, Operational Excellence and workloads formula. Slow variables are the community-based variables where we spend our time and care. (Researcher notes, reflective meeting)

In short, resilient community relationships manifesting themselves as functioning networks, are seen as one significant aspect of sustainability, in particular the need to maintain these over the longer term despite short term problems with workloads, restructuring and contestation around decision making. As well as documenting the need for such networks, the process of undertaking the research project actually contributed to the creation of networks. For example the art project was seen as providing an opportunity for staff to chat together in informal settings and discuss their individual meanings of sustainability. Similarly community networks were being developed through collaboration with a community-based sustainability education project which is modelled on the international transition town movement (Hopkins, 2008). Likewise, wider academic networks were being developed through sustainability education conference attendance by staff who would not normally attend these events.

Shared Meanings of Sustainability

Developing a shared meaning of sustainability for pragmatic conversational purposes appears to be a critical component of transitioning the curriculum towards it. This section highlights the meanings of sustainability that were shared, and their potential to aid authentic dialogue in the future.

Traditionally work-life balance has not been seen as a major component of sustainability practice, as it has belonged in the realm of management and productivity negotiations. However, data from this project suggest that it should be part of our sustainability agenda, as this is seen as a survival issue for staff. A major study in an Australian university by Hammond (2011, pp. 116, 172) makes this link very clearly. Several of the focus groups defined sustainability in terms of their day-to-day survival as academics. For example, one participant noted that "burnout is palpably not a sustainable practice". This aspect of sustainability elicited the greatest passion. Conversely it was also the motivator of ingenuity.

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> Real flexibility is required; for example this program has survived due to continual changing of the course and creating new units whilst redistributing key concepts and content. This is quite evolutionary, the need to move in response to different forces/motivations for change. (Participant, focus group 3)

Tight funding was also a motivator for recycling and reusing practice teaching materials in one program which had the added benefit of reducing waste. However, the loss of students because of online provision of units taught centrally from Perth was a threat to the survival of some programs. Thus funding restrictions can simultaneously encourage sustainability (by promoting thrift) and discourage sustainability by promoting disillusionment and burnout when work is centralised as a cost saving initiative. The latter is also referred to in Hammond (2011).

Importantly in this study, the process used to discuss the meaning of the term sustainability not only enabled the articulation of a local understanding, but importantly, it was an integral part of the transformative learning process. Simply providing definitions and moving on would not have allowed the meaning making which is now shared. Even so, the discussions with various groups highlighted the distinct emphasis given by diverse disciplines represented by the different programs on the campus.

While this variety of meanings can easily be accommodated within definitions such as the four pillars UNESCO (2002) it can present a difficulty when transdisciplinary activities are the goal. In fact, there was disagreement about whether we needed to find a shared definition, with science and business related programs favouring a decisive outcome, and those in humanities being more comfortable with a diffuse outcome. The interpretations appear to reflect the underlying epistemological differences between programs. These epistemologies may be tacit rather than explicit and are not addressed in the dialogues, making authentic conversations more difficult. That is, to reach shared meanings may require a very far ranging discussion. However the point of this work is the discussion itself as a process for sustainability transition rather than the outcome.

Such disparity is illustrated in the table of meanings derived from the program focus groups and categorised according to their relationship to the four pillars (Table 1). It is envisaged that in the next action cycle, this table will act as a tool to encourage dialogue about the meanings of sustainability within and across programs. In particular it is envisaged that the table will assist teaching staff to think through how they can reorient their curriculum towards sustainability.

Conclusion and Future Directions

This paper describes the methodology and findings for the second action cycle of a project that has been designed to research the process used for the transition of curriculum, teaching and learning to sustainability at a small, regional university campus. The process has the potential to produce a robust social sustainability focus. Our project is distinctively Australian in that it is part of an emerging trend in Australia to create social frameworks which act as pillars for sustainability education action projects. This movement is already quite marked in teacher education (Ferreira, Ryan, Davis, Cavanagh, & Thomas, 2009; Hammond, 2011; Hammond & Churchman, 2008) and is becoming evident in other university contexts (Holdsworth et al., 2006; Wooltorton et al., 2010).

In our project sustainability has been used as an explicit organising principle, and the action research activities have formed the transition process. In this way, learning and change has been facilitated through reflection on practice with learning as the main intention. The original approach was to leave the definition of sustainability open

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TABLE 1: Faculty context: Linking the pillars of sustainability to meanings discussed within the Faculty program workshops

Program	**Biophysical systems - life support systems for all life**	**Economic systems - continuing means of livelihood for people**	**Social/Cultural - ways for people to live together peacefully, equitably & with respect for human rights & dignity**	**Political systems - through which power is exercised fairly & democratically to make decisions about all systems**
Business	Minimise the impact on the environment for business continuity	Development and growth to meet people's needs without comprising the needs of future generations	Increasing recognition of the dimensions of corporate social responsibility and the need to serve all stakeholders	Sustainability includes leadership for the greater good
Computing	E-waste; power use in computing	Analyse systems of data; workloads	Potential in technology for social change; equality of access to information	
Creative Industries	Writing and the environment	We embed the concept of *industry* into study of the creative arts through workplace integrated learning and community engagement	Creative Industries units assume "poly-ethnic thinking" regarding culture & community. Local artists & culture	The course fosters critical thinking skills in students which enable them to understand the world through perspectives other than their own
Education	Incorporates easily into most subject areas; ecological literacy and science literacy	Sustainability is integrated; unsustainable workloads limit opportunities; natural, social and economic systems interrelate	Cooperative learning strategies; creative, critical and reflexive thinking strategies; systems thinking	Active and informed citizenship is the overarching goal; democracy is a core value; we create our future collaboratively and individually
Nursing	Preventative health; management of medical waste; recycling	Sustainability of a rural health workforce; sustainability of work practices	Teaching within ethics unit, ie. respect for life	
Social Work	Human rights – access to necessities of life; impact of climate change; disaster response.	Equitable distribution of wealth	Professional ethics around human rights and social justice. Online delivery to improve access	Improving understanding of participatory democracy
Coastal Environmental Science (Surf Science)	Coastal care; overfishing; global warming; coral bleaching	Ongoing viability of the program; tourism; surfing population; the surfing industry	Breaking down silos at ECU; improving opportunities for networking on campus; surf harmony – tolerance and respect in the lineup.	Surfing for the future; marine science education; knowledge is power

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and this was effective in allowing important aspects of sustainability to be included or emerge. In relation to development of a shared meaning, our study affirms that broadly defining sustainability is a strength if used carefully to foster involvement in dialogue, as contended by Wals and Jickling (2002). While not all participants approved of the original approach - to not foreclose on meaning - particularly as ideas continually shifted, the ongoing discussions around sustainability and the notion of a sustainable future have formed the heart of the project. Conversations were rich and deep, and revealed the first views of an emergent transdisciplinary way of working, together with creative ways that would lead us into action cycle three. High levels of "systemicity" characterise more sustainable educational institutions, which feature qualities such as "internal connection, relatedness and coherence" and less tightly defined programs and courses (Sterling, 2004, p. 62). This compares to systematic management and organisation typical of non-sustainable institutions which emphasise hierarchical control, firm rules, clearly defined structures and a degree of inflexibility (Sterling, 2004, p. 62). Thus referring to Sterling's (2004) work, a creative, more sustainable culture of learning was produced by the action research. Within this structure, transdisciplinary research approaches were explored and utilised as the normal disciplinary structures and boundaries did not apply.

Other findings to emerge were the constraints associated with the issue of authentic dialogue; issues around power and authorisation; and problems of site communication and maintaining effective networks. We found that each of these can work together in ways that enhance and/or hinder sustainability transition. Our findings also support those already found in the literature which reveal a poor work-life balance as a key constraint to participation in sustainability transition projects and this is certainly a barrier in social sustainability acquisition (Hammond, 2011). Specifically a lack of time limits authentic dialogue that would enable collaborative ways of working within the university work environment (Steele, 2010; Hammond & Churchman, 2008). Data in our study suggested that issues around lack of time and inappropriate life-work balance constrained the potential of staff to work in transdisciplinary ways.

Reason (2002, p. 3) writes:

> In very simple terms I want to articulate a dreadful warning: we cannot go on the way we have been doing based on the way we have been thinking. And I want to offer a challenge, an expression of hope for a way forward based on a participatory ethos. I want to explore how a worldview based on the experience of ourselves as participants in the processes of life on earth might provide a more fruitful perspective.

The challenge put forward by Reason (2002) also motivates the authors of this paper. Sterling (2004) comments that the usual way of thinking about sustainability in higher education is to integrate it into the education schema of the university, that is, to add to an already overcrowded curriculum. He argues that instead, sustainability education implies an epistemological shift in higher education and in society which is what he means when he calls for systemic transformation. Within Australia, the realm of social sustainability – where we position this current study – is a newly emerging field. The journey of change is just beginning, however the metaphoric terrain to be traversed is clear and encouraging outcomes are already visible.

Afterword

At the time of writing, the researchers had just completed the project's third action cycle which had focused on connecting the university with the local community, particularly schools and environmental organisations. Accordingly, a number of interconnected

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sustainability education projects along the lines of the international transition movement (Hopkins, 2008) now link the university with its wider community. A focus on process for transition is being maintained.

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Keywords: transition; sustainability; interdisciplinary; process; learning.

Endnote

1. In the literature the terms environmental education (EE), education for sustainability (EfS) and sustainability education – and a mixture of these terms such as environmental education for sustainability – are often used interchangeably for a similar range of meanings (Cutter-McKenzie, 2011, p. 350). In this paper the term we use for all of these purposes is sustainability education. By this we refer to the array of knowledge, skills, understandings, activities and practices used to learn, demonstrate or acquire qualities and attributes of sustainability. The word sustainability itself is deeply contested from a range of perspectives. However suffice to say that in sustainability education contexts it tends to be based on a critique of contemporary western capitalism and is generally understood as a process for transitioning toward practices consistent with an overarching philosophy of ecological and social justice (for example see Cutter-McKenzie, 2011, p. 351–353).

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