# Education for Sustainability in Australian Universities: Where is the Action?

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**Abstract** As institutions of education and learning, the higher education sector has a significant role to play in implementing the United Nations Decade of Education for Sustainable Development (2005–2014). Some institutions have already acknowledged, and are shaping, their roles in working towards sustainability through appropriate development and implementation of institutional policy and practices, including the signing of international agreements related to sustainability. Such institutions are specifically linking learning to sustainable development. This study was initiated as a result of our interests to i) identify the current commitment to education for sustainability and ii) learn from the institutional lived experiences about how education for sustainability may be realised, within the Australian university context. This is a preliminary investigation to provide baseline insights into how education for sustainability with a focus on curriculum innovation is being implemented within the Australian university landscape. This investigation is informing our further research to understand institutional change of education for sustainability in universities.

## Sustainability, Learning and Curriculum in Higher Education

The challenges of sustainability have been inextricably connected with education and learning. Support for the role of education to facilitate sustainable development comes from international directions such as Agenda 21 (International Institute for Sustainable Development, 2005) and the UN Decade for Education for Sustainable Development (IUCN, 2004), as well as business, community and professional associations that have identified the need to take better care of the environment (for example Barbera, 1994; Cairncross, 1995; Royal Australian Institute of Architecture, 1995). This widespread interest for sustainability in higher education from the broad sectors of society including tertiary students, employers, business and the academic and scientific communities provide pressures on universities to take on the responsibilities for leadership in sustainability (Bekessy et al., 2003) or a moral obligation for such leadership (Wright, 2002). These demands begin to articulate the rationale, and need, for graduates to develop "literacy" in sustainability as part of their tertiary education.

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This also indicates that universities need to facilitate education for sustainability within their institutions.

There is evidence that many universities have taken up the "greening campus" model that encompasses on-campus sustainability resource management practices. However, education for sustainability (EfS) as reflected in curriculum has lagged behind (Bekessy et al., 2003; Noonan & Thomas, 2004). Hence, this research focuses on identifying evidence for EfS as manifested in the curricula of Australian universities.

Many students already have a broad environmental awareness when they come to tertiary institutions (Ridener, 1997), although this does not necessarily give them the ability to assess environmental issues and take action on them. Nonetheless, some graduates have been receiving an "ecological literacy" (Orr, 1992) through the specialised environmental programs, such as environmental science, environmental engineering, and environmental studies. However, these programs are often based in a single discipline, and are not intended to aid development of education for sustainability for *all* students. Consequently, apart from the occasional course/subject that is often an elective (Cosgrove & Thomas, 1996; Wolfe, 2001), most tertiary students have few opportunities to participate in education for sustainability within their disciplines. The significant disadvantage of this approach is that students can interpret the sustainability material, and its messages, to be "in addition" to their core (disciplinary) studies, and therefore not as important.

Meanwhile, there has been increasing support from across the community for the implementation of ecological literacy in universities (Thomas, Kyle & Alvarex, 1999). At the international level this movement has been facilitated by the development of several initiatives aimed at the tertiary sector (Kliucininkas, 2001; Bekessy et al., 2003; ULSF, 2001). Particularly well recognised is the Talloires Declaration, which according to University Leaders for a Sustainable Future (2005) has been signed by over 320 institutions from 47 countries across five continents. Importantly, the institutions that sign this declaration commit themselves to operational activities and curriculum initiatives that lead to sustainable development.

There has been much discussion about the meaning of education for sustainability[1] reflecting the contestations of an evolving conceptualisation as it is put into practice (for example, Filho, 2000; Hesselink, van Kempen & Wals, 2000; Thomas et.al., 1999; 2000). While EfS comprises several aspects (Orr, 1992), recent discussion focuses on values and environmentally ethical activity being an integrated component of the curricula (Bawden, 2004; Sterling, 1996), and increasing support for the implementation of EfS within the tertiary education sector is evident (Thomas et al., 1999). Curriculum structures and materials are readily available (for example Alverez & Kyle, 1998; and Second Nature, 2002), but they do not seem to have been widely used.

Even with the flexibility of curriculum models and the availability of support materials, we still see little indication of university students being exposed to EfS. Yet there is increasing discussion of the implementation of EfS. Noonan and Thomas (2004) and Thomas (2004) have discussed a range of issues that have been identified as necessary supports for the development of EfS, including:

- creation of a sustainable development policy/programme to guide the institution e.g., a management strategy which incorporates sustainable development as a strategic aim (specifically identified by Appel, 2002; Ferrer-Balas, 2002; and Rowe, 2002);
- encourage individual departments/schools to produce a "curriculum greening plan" (noted by Ferrer-Balas, 2002; and Roorda, 2002); and
- the support of the executive board (or people) is a crucial condition to be successful in a process of integrating sustainable development (Appel, 2002).

This leads to the question of whether Australian universities are providing high level direction and support through the development, and implementation, of policies or strategies focused on education for sustainability. From this point we will look briefly at the results of recent surveys to assess the extent of education for sustainability. These have sometimes touched on the question of strategies, but have not explicitly investigated the degree to which they exist, nor the role of them in the universities' curricula. To investigate the role of strategies we comment on a survey we conducted of Australian universities and reflect on the possibilities for EfS being initiated.

## Current Interest in EfS for Australian Universities

Several reviews have been undertaken regarding the extent to which Australian universities have adopted EfS. Studies with a focus on curriculum change have generally drawn similar conclusions as demonstrated in the summary of key points illustrated in Table 1.

TABLE 1: Key findings of research into adoption of education for sustainability in Australian universities

| Year of survey | Researchers and reference | Key findings |
|---|---|---|
| 2000 | Thomas & Nicita (2003) | In response to a survey in late 2000, the majority of responding universities (total 21) said education related to sustainability was covered in their curricula, but the extent of coverage was very variable. About one-third were including EfS in the curricula of specific departments or disciplines, but less than half number replied that sustainability education was included in all disciplines. |
| 2001 | Bekessy & Burgman (2001) | Bekessy & Burgman (2001) concluded "that most universities in Australia and elsewhere in the world have moved significantly towards sustainable practices in recent years." (p. 2). A slight majority responded that the extent to which courses addressing sustainability within their institution was either 'quite a bit' or 'a great deal'. However, integration of environmental knowledge, values and ideas into courses across institutions was at a low level. |
| 2002 | Carpenter & Meehan (2002) | The results of the survey, with a low response rate of ten, indicated that for the majority of universities environmental management was not a key activity, and only one made a specific reference to 'greening' the curriculum. |
| 2003 | Thomas (2003) | A survey of the universities' web sites in 2003 showed that few were taking action to improve the environmental management of their operations, while interest in a green curriculum that was across disciplines and the university was even less evident. Encouragingly about half indicated that there were staff members interested in environment/ sustainability, and that related projects and activities have been undertaken. |
| 2005 | Tilbury et al. (2005) | Tilbury, et al. (2005) came to similar conclusions as the other researchers:<br>"A handful of sustainability initiatives currently exist in Australian further and higher education institutions but these tend to focus on single projects to address sustainability, as opposed to taking a more systemic view of learning and change across the institution." (p. 1) |

These findings are also reasonably consistent with the overall level of activity in the Asia-Pacific region. According to Haddad (2005), there is a range of responses related to the need for EfS across the region; indicating that while there is considerable activity in schools, most activity in universities is focused on teacher training. Otherwise, the instances of EfS in university curricula appears to be limited to a small range of specific programs, or individual subjects, with an environmental emphasis. EfS across the curriculum of the spread of disciplines in universities was not apparent.

The challenge for higher education institutions is to turn an abstract concept of sustainability into the concrete practices of education for sustainability. The multiple pathways as higher education institutions work towards sustainability reflect contestations and diversity in design as education for sustainability emerges in practice (Corcoran & Wals, 2004). There is a role for significant national and international strategic policy (often in the form of declarations and frameworks such as the Talloires Declaration or government policy on sustainability) in the implementation of education for sustainability in higher education; but there is a question of the magnitude of their influence (e.g., Moore, 2005; Wright 2002).

The limited activity in Australian universities led us to consider how important the "theory" of directing change from the "top" with strategies might be. We hypothesise that governments play a role in providing guidance and influencing the higher education sector. Through policy and strategy, it is thought that governments are able to stimulate participation in education for sustainability. In Table 2, we outline the relevant elements of recent governmental Australian education strategies with a sustainability focus that have jurisdiction within the higher education sector.

These international and national strategies are broad and strategic in nature. They note that EfS (or equivalent) is important and that universities are encouraged to adopt it, but do not provide specific directions as to what universities should do with their curricula. This short-fall could be overcome by the universities developing their own policies and strategies (as we noted above Appel (2002) has commented that this is a key action for the introduction of EfS). To assess this situation we developed a small-scale survey of Australian universities, specifically to ascertain if they were publicly engaging with EfS.

## Scanning for Evidence of EfS Curricula in Higher Education: The Web-Based Survey Approach

We decided to use a web based approach rather than a direct survey, based on previous experience of the difficulty of the survey reaching the relevant person, and the general lack of response (Thomas & Nicita, 2003). The search of each institution's web pages used the terms: Education for Sustainability, Environmental Education, Learning & Teaching Strategy, Environmental Policy, Curriculum & Sustainability and Talloires Declaration to find documents that indicated the university's commitment to implementing education for sustainability into the curriculum. As a consequence, key indicators of activity included i) the university's adoption of the Talloires Declaration, or ii) where graduate attributes, identified in a learning and teaching strategy, included references to sustainability.

In late 2004 the web sites of forty-two institutions within Australia were searched. At that time eight were signatories to the Talloires Declaration (now increased to ten, ULSF, 2005). Of these, six had indicated on their website, in one section or another, that their institution was taking steps to integrate education for sustainability into their curriculum. The web based search also revealed three institutions that were not signatories to the Talloires Declaration, but otherwise had taken steps to integrate education for sustainability into the curriculum (refer to Table 3). Of the institutions

TABLE 2: Environmental education and sustainability education strategies recently developed by Australian governments

| Level of government | Strategy | Key elements of strategy related to higher education |
|---|---|---|
| Australian Government | Environmental Education for a Sustainable Future (Environment Australia, 2000) | makes the single reference to universities to "pursue integration of Environmental Education via the Australian Environmental Education Foundation and National Environmental Education Council and by developing partnerships with tertiary bodies." (p. 9) |
| New South Wales Government | 'Learning to Live Sustainably, NSW Environmental Education Plan 2002–05' (Council on Environmental Education, 2002)<br><br>'Learning to Live Sustainably, NSW Environmental Education Plan 2006–09: Consultation Draft' (Council on Environmental Education, 2005) | outlines general principles and directions for sustainability education, but the only explicit connection to universities is the proposal for them to expand environmental education in teacher education.<br><br>However, the draft for the plan's revision begins to identify the role of universities. It calls on universities to communicate knowledge about environmental and sustainability issues and promote sustainable transport behaviour. The draft also proposes that "the Council will encourage ... enhancement of the teaching of sustainability in universities through consultation with the National Environmental Education Council and relevant professional associations. " (p. 32) Two 'actions' promote sustainability education for teachers as part of their training, and a further (Action 48) proposes the NSWCEE "... encourages the Australian Vice-Chancellors' Committee to take a leadership role ...(for) designing a select number of discipline and professionally related materials and/or courses on sustainability to integrate sustainability issues into their teaching." (p. 34) |
| Western Australian Government | 'Environmental Education Strategy and Action Plan' (Department of Environment, 2004) | identifies a clear role for universities under the objective of 'Formal Education, ie "2. Work towards the inclusion of environmental education in all undergraduate and postgraduate degrees. 3. Help ensure that all vocational teaching, higher education courses and degrees contain a relevant dimension of environmental education." (p. 5) These directions are embodied in Actions 31 and 32, which say that the government will work with the WA universities to "encourage them to incorporate a sustainability dimension into all disciplines in all higher education courses." and to "... incorporate environmental education into undergraduate education degrees." (p. 16) |
| Victorian Government | 'Learning to Live Sustainably: Victoria's approach to learning-based change for environmental sustainability; Draft - September (Department of Sustainability and Environment, 2005) | notes the role of many sectors, including universities, in behaviour change, but does not outline specific actions for most. Universities would be involved via "... a package of consolidated programs for those key sectors of society that are particularly well-suited as a focus for high quality, large scale education and behaviour change programs ..." (p. 24) |

that indicated some direction in developing EfS, there was variation in the degree to which the information was visible, and the depth of information provided (also shown in Table 3).

TABLE 3: Australian universities indicating education for sustainability activity on their web sites, and the visibility and depth of the information

| Institution | Signatory to Talloires Declaration | Education for Sustainability in curriculum | Accessibility[1] of documents | Detail[2] of documents |
|---|---|---|---|---|
| Australian National University | yes | yes | easy | detailed |
| University of New South Wales | yes | yes | easy | detailed |
| University of Melbourne | yes | yes | moderate | detailed |
| RMIT University | yes | yes | easy | moderate |
| University of Technology Sydney | yes | yes | easy | moderate |
| University of Sunshine Coast | yes | yes | moderate | moderate |
| Charles Sturt University | considering[3] | yes | moderate | moderate |
| University of South Australia | no | yes | moderate | moderate |
| University of Queensland | no | yes | easy | general |
| Monash University | no | yes | easy | detailed |
| Canberra University | yes | no | easy | general |
| University of Western Sydney | yes | no | n/a[4] | n/a[4] |

**Notes**

1. Accessibility of documents relating to education for sustainability was ranked as one of three possibilities: easy, moderate or hard.
   *Easy* - when search criteria were entered and documents were found within the first list of results, without needing to refine search further.
   *Moderate* - when documents were found after searching through several criteria and after some refining of the search (perhaps taking up to five minutes of the searcher's time)
   *Hard* - searches taking longer than five minutes with few results.
2. Detail of description relating to education for sustainability was categorised as: detailed, moderate, general. A *detailed* document was one that uses direct language, and demonstrated a reasonable amount of thought to the objectives of education for sustainability; eg from the University of Melbourne's web site:
   "The University EMS, certified to International Standard ISO 14001, will integrate research, teaching and student involvement into environmental management and will be an exemplary model for other educational institutions."
   *Moderate* and *general* documents provided progressively less information and clarity about the relation to EfS.
3. Indicated on website the intention to sign Talloires Declaration.
4. Not Available - documents related to EfS were not available on the university website.

## Digging Deeper: What's your EfS Action?

From the results of this internet search it was apparent that there is a degree of activity in EfS within some Australian higher education institutions. To gain a better understanding of this activity, a short questionnaire survey was distributed to the twelve universities identified as being engaged in EfS (Table 3). The questions were based on key themes identified in the literature focused on gaining an understanding of the experiences universities have had in implementing and supporting EfS, and its impact across the disciplines of the institution (see Figure 1 for the list of questions).

1. How is education for sustainability being implemented into the university curriculum?
2. What factors have assisted implementation?
3. What barriers are you encountering in your efforts to implement this curriculum?
4. Have there been attempts made to integrate education for sustainability perspectives across the entire university?
5. Which departments/schools/faculties have adopted education for sustainability perspectives into its curriculum?
6. What processes are in place to support faculties that are attempting to achieve the aims of implementing curriculum with sustainability perspectives?
7. If Communities of Practice have emerged to learn and share how such curriculum is designed, developed and taught, please provide a summary of the composition of the communities and how they have been operating
8. If possible, please provide any documents (such as policies, research papers, strategic implementation papers etc) or other relevant resources that would assist our understanding of this?
9. If copies of resources are not available, please indicate the location of these resources (e.g., a website, journal) that could assist our investigation?

FIGURE 1: Survey questions

With a covering message, the survey was sent via email to the vice chancellors of the selected universities. We found that four of the five respondents were academic staff to whom the survey was forwarded. A follow-up email was sent to encourage participants to complete the survey, but only five out of twelve (42%) were returned. This undoubtedly reflects the busy nature of the university workplace to participate in research that others have also found (e.g., Moore 2005); but it may also signal little progress towards EfS within the institution, which may make completing the survey difficult or a lower priority.

To maintain anonymity of institutions while discussing some parts of the data, each university that responded to the survey has been numbered from 1 to 5 in Table 4.

Given the low response rate we have not attempted to draw trends from the data. Rather, in the following we indicate the spread of responses, and comment on the specific information that illustrates key issues.

The responses from two universities stand out. University 1, having signed the Talloires Declaration in 2002, seems to have made considerable progress towards its objectives (refer to Table 4). Through a central programs office, it is supporting faculties to host speakers that will promote the ideas of education for sustainability. Also, through a specific "green curriculum" initiative, it is attempting to establish a curriculum inclusive of education for sustainability. While University 2 signed the Talloires Declaration much earlier (in 1996), it has engaged fewer mechanisms to illustrate its commitment to education for sustainability. However, key actions like signing the Declaration and development of graduate attributes are evident. University 4 has also signed the Talloires Declaration however the survey it completed was very brief, most likely indicating that it has not made a great deal of progress towards education for sustainability.

Examination of Table 4 and the detailed responses provide several observations and emerging themes as described and discussed in the following section. We found a wide variety of initiatives are being used to achieve EfS across the participating institutions; and some have undertaken a number of actions.

### *Accountability of Signatories to Significant Strategies*

One institution highlighted the importance of education for sustainability by giving the Deputy Vice Chancellor (Academic) responsibility to report annually to the University Council on the university's compliance with the Talloires Declaration. This issue of accountability, particularly as a result of becoming a signatory to a national/international declaration, is critical to monitor the progress and ongoing commitment of working towards becoming more sustainable rather than providing universities the ability to "greenwash" or reduce declarations to a branding gimmick (Wright, 2002).

### *Sustainability Literacy and Learning*

Offering a more "bottom up" approach, another university highlighted the progress made towards education for sustainability through the work of a small number of champions. These champions were able to influence the initiation of a system, where graduates are required to complete a number of general courses of which some may be environmentally focused.

From the responses given, the most common mechanism used to implement EfS is the use of graduate attributes. The development of graduate capabilities that emphasise sustainability mainly had a social and/or economic focus, suggesting that EfS continues not to be well understood, or the universities are choosing to use the term in very specific ways. Limited understanding of sustainable development, and concern over the difficulty of introducing EfS, has also been identified by Filho (2000).

### *Curriculum Approaches*

Responses to where EfS was located in the university curricula illustrate almost the spectrum of possibilities. While one institution indicated that EfS had almost completely bridged the range of disciplines (and programs), at the other extreme were two universities that did not respond, suggesting that EfS was not represented in any program areas. The others indicated that EfS was at various phases of implementation, or that only a discrete number of disciplines were involved.

This may indicate a transition of EfS understanding as manifested in curriculum approaches. Increasingly there is a call for higher education to acknowledge the

TABLE 4: Summary of survey responses to education for sustainability implementation questions (Survey questions 1 & 2)

| Q | Mechanism | University | | | | | Example |
|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | |
| 1 | Governing body for environmental programs | √ | | | | | Central programs office to coordinate a postgraduate environmental program. |
| | Sustainability award | √ | | | | | Deputy Vice Chancellor offers a sustainability Writing Award to academics and their postgraduate students. |
| | Green Curriculum Initiative | √ | | | | | A program with the undergraduate and postgraduate curriculum to identify units, across all faculties, where objectives include environmental sustainability. |
| | Engaging with the sustainability community | √ | | | | | Central programs office assists academics to bring relevant academics and community or industry speakers to the University. |
| | Focussed environmental programs | | √ | | | | Undergraduate degrees that are environmental (sustainability) focussed, ie engineering (water, energy), science, arts & social science. |
| | General education courses with EfS option | | √ | | | | Students of all disciplines have access to compulsory general education' programs can choose environmentally focussed courses. |
| | Graduate attributes | √* | √* | √ | √ | √ | Understanding of sustainable economic development was adopted by the university as a graduate attribute.+ |
| 2 | Signed Talloires Declaration | √ | √ | | √ | | |
| | Progress report on Talloires objectives | √ | | | | | Deputy Vice Chancellor (Academic) reports annually to Council. |
| | Commitment though additional sustainability related agreements | √ | | | | | Signatory to the Global Compact (which seeks to advance responsible corporate environmental citizenship so that business can be part of the solution to the challenges of globalisation). |
| | Staff support for EfS curriculum | | √ | | | | EfS has been championed by key academics staff since the early 1990s. |

## Notes

Question 1 - How is education for sustainability being implemented into the university curriculum?
Question 2 - What factors have assisted implementation?
The table also encompasses responses for Question 3 - Have there been attempts made to integrate education for sustainability perspectives across the entire university?; where each respondent stated: "refer to question one" or "refer to above".
√ Indicates the university providing a response
* Information gained from university website not from survey results
+ Response from one university.
Blank spaces indicate no response to the given question. This suggests few examples of actions taken to implement EfS, and a limited commitment to date in its development.

complexity of sustainability and that it requires curriculum innovation (Tilbury et al., 2005) and to go beyond interdisciplinary curriculum to engage in transdisciplinary curriculum that will promote collaborative and transformative learning (Moore, 2005).

In response to the question about the barriers to EfS (Q. 3, Figure 1), the most common response was that institutions already have difficulty accommodating all the other curriculum requirements. This seems to confirm the misunderstanding that sustainability principles should be treated separately and have no space in a program that has traditionally been thought to have no impact on environmental sustainability. As argued by Stephen Sterling (2004)

> ... sustainability is not just another issue to be added to an overcrowded curriculum, but a gateway to a different view of curriculum, of pedagogy, of organisational change, of policy and particularly of ethos (p. 50).

Interestingly, University 1, which seems to be institutionalising EfS through diverse mechanisms, responded with "Very few [barriers]", continuing with "Marketing [people] are really excited about our 'green image'". This presents for complex analysis. It may suggest that the multiple mechanisms utilised by the university is overcoming many barriers to EfS implementation. In contrast, the use of "our green image" by the marketers suggests that EfS is being commodified. This latter image raises the question of the role of the university as a corporation with customers competing in a global economy versus a learning organisation for sustainabilty (Moore, 2005).

### *Building Capacity for EfS Teaching and Learning*

A wide range of responses was also found regarding the processes in place to support implementation. Universities 1 and 2 provided responses about establishing communities of practice to support sharing the practice of curriculum, learning and teaching among academics. The other institutions did not respond to this question, suggesting little activity and/or possibly little implementation.

## Taking Stock

Taking the results of the web and email surveys overall, the results indicate a variety of responses suggesting varying levels of commitment to EfS by higher education in Australia. The least commitment is indicated by those universities that, through the search of their web sites, showed no acknowledgement of EfS. While some demonstrated recognition (Table 3), for most this did not translate into tangible activities as identified in the email survey. Even in the motivated group we selected to survey by email, the majority (58%) did not respond to our survey, suggesting that they had little to report or there was a lack of priority for EfS. Three of the five institutions that did respond provided only very basic evidence of EfS implementation (refer to Table 4).

From our data, universities 1 and 2 demonstrated the strongest commitment to EfS. Both indicated a range of activities linked to EfS; for example having a Strategic Plan, and a Learning and Teaching Strategy that supports education for sustainability, and where the Deputy Vice Chancellor (Academic) reports on compliance with the Talloires Declaration objectives. Characteristics such as having signed the Talloires Declaration and other sustainability related agreements, and linking EfS to graduate attributes indicates that there is some broad direction, or strategy, for EfS within higher education. However, from our data, no university indicated that a specific strategy was being developed to implement EfS. Even where the strategy for University 2 was referred to, the connections to multiple aspects of EfS are indirect (see Figure 2). In this case EfS is limited to economic and environmental aspects.

**Purpose identified –**
"To excel in research as a contribution to a productive and sustainable economy, the prosperity of our nation, the health and well-being of its people, and the protection of our environment."

**Value articulated –**
"We believe that the principles of environmental sustainability should underpin and genuinely apply to all activities in which we are involved."

**Strategic priority identified –**
"Establish and resource the Environmental Network to provide regional leadership in managing, researching and teaching environmental sustainability."

FIGURE 2: Example of indirect links to EfS in University 2's Strategy Plan

## What Now?

As we have indicated earlier, having local, institutional strategies for guiding curriculum change is seen as being an essential stage for the implementation of EfS (see Appel, 2002; Ferrer-Balas, 2002; Rowe 2002). However, from the results of our surveys, it does not appear that specific, coordinated and systemic strategies for EfS have been developed by any Australian university. This may be a contributing reason as to why there is little EfS activity within the universities. It seems that creating a local institutional strategy by a university enables a "micro-approach to sustainability" and provides an opportunity for "policies that are meaningful for their particular situation" (Wright, 2002, p. 112).

Where does that leave those of us who are trying to have our universities adopt EfS? An example of a micro-approach led from the "bottom-up" can be found at RMIT. The context for this activity is a ten year history of small scale interventions to establish environmental education, and more recently sustainability education, in the non-environmental programs (see Thomas et.al., 1999). During this period the university's teaching and learning strategy and overall strategy have intermittently contained references to the coverage of environment and sustainability in the curriculum. However, there has not been any plan nor sustained discussion related to how these proposals could be attained.

To fill this vacuum a small group of academics secured funding from a state government department to develop a model for implementation of EfS. The Beyond Leather Patches (BELP) project was developed to provide an effective and practical approach for integrating the broad concepts of sustainability into a wide range of university programs. More broadly, the project aimed to achieve a deeper understanding of methods to achieve curriculum and institutional change for sustainability amongst academics.

Building on the experiences of earlier projects, BELP provided an opportunity for educators to engage in the theory of sustainability education through a supported and facilitated process. Three Schools (discipline areas) were involved in the project. Critically, the project methodology created ownership of the change process through the development of an understanding of sustainability issues as they relate to education within the Schools and their respective professional practices.

During 2005, the project's researchers audited the sustainability content initially offered within the Schools and conducted a survey of staff attitudes towards teaching

sustainability. The results contributed to the development or revision of sixteen courses based on principles of sustainable development. A series of workshops also helped the educators shape their own visions of sustainability and to identify the type of support needed to transform teaching approaches. To support these changes staff had access to a web resource with tools, information and examples of the general theory behind sustainability education, current best practice, case studies, and information and links to sustainability concepts and tools for use in course material (more details of BELP can be obtained from Holdsworth et al. [in press]).

Importantly additional support has been received to extend the range of courses that have been renewed, and to explore the opportunities for organisational change. Recently, this type of institutional change approach has also been identified as a significant direction for higher education in Australia (Tilbury et al., 2005). This RMIT University project provides opportunities to design, examine and reflect on diverse models within one institution about how institutional learning for change may facilitate EfS. The project is contextualised and explores the differential roles of education for sustainability leadership (e.g., from "top" and "bottom" levels within and beyond the organisation) and their associated implications for institutional approaches and change. The bottom-up approach has been identified at one of the universities we surveyed, and is being used at RMIT. However, it is emerging that a "bottom-up" approach also requires support from the "top" to create opportunities for and sustain organisational change.

*Keywords*: education for sustainability; curriculum; institutional change; universities; learning; curriculum innovation.

## Endnotes

1. The authors of this paper recognise that Education for Sustainability (EfS) is still an evolving concept and has its origins in Environmental Education. We define EfS with its four broad sustainability pillars: ecological, socio-cultural, economic and political/governance.

## References

Appel, G. (2002, September). Integrating sustainable development into a university curriculum with emphasis on content, value education and reflection. *Proceedings of the Environmental Management for Sustainable Universities (EMSU) 2002 Conference.* Grahamstown, South Africa: Rhodes University.

Alvarez, A., & Kyle, L. (1998). *Integration of Waste Minimisation Principles into Higher Education Curricula.* Melbourne: EcoRecycle Victoria.

Barbera, M. (1994) *Environmental Issues: A Challenge for Management Accountants.* Melbourne: Australian Society for Certified and Practicing Accountants.

Bawden, R. (2004). Sustainability as emergence: The need for engaged discourse. In P. B. Corcoran & A. E. J. Wals (Eds.), *Higher education and the challenge of sustainability: Problematics, promise and practice* (pp. 21–32). Dordrecht: Kluwer Academic Publishers.

Bekessy, S., & Burgman, M. (2001). *Environmental Best Practice in Australian and International Universities.* Unpublished report to the Vice Chancellor University of Melbourne, November.

Bekessy, S., Burgman, M., Wright, T., Filho, W. L., & Smith, M. (2003). *Universities and sustainability.* Carlton, VIC: Tela Papers, Australian Conservation Foundation.

Cairncross, F. (1995). *Green Inc: Guide to Business and the Environment.* London: Earthscan.

Carpenter, D., & Meehan, B. (2002). Mainstreaming environmental management: Case studies from Australasian Universities. *International Journal of Sustainability in Higher Education*, 3(1), 19–37. Available ProQuest Information and Learning Company [May, 2002].

Council on Environmental Education (NSW) (2002). *Learning to live sustainably, NSW environmental education plan 2002–05.* Sydney, NSW: NSW Council on Environmental Education.

Council on Environmental Education (NSW) (2005). *Learning to live sustainably, NSW environmental eeducation plan 2006–09: Consultation Draft.* Sydney, NSW: NSW Council on Environmental Education.

Corcoran, P. B., & Wals, A. E. J. (Eds.) (2004). *Higher education and the challenge of sustainability: Problematics, promise and practice.* Dordrecht: Kluwer Academic Publishers.

Cosgrove, L., & Thomas, I. (1996). Categorising tertiary environmental education in Australia. *Australian Journal of Environmental Education*, *12*, 27–34.

Department of Environment (2004). *Environmental education strategy and action plan.* Perth, WA: Department of Environment.

Department of Sustainability and Environment (2005). *Learning to live sustainably: Victoria's approach to learning-based change for environmental sustainability; Draft – September.* Melbourne, VIC: Department of Sustainability and Environment.

Environment Australia (2000). *Environmental education for a sustainable future: National action plan.* Canberra, ACT: Environment Australia.

Ferrer-Balas, D. (2002, September). Global environmental planning at the Technical University of Catalonia. *Proceedings of the Environmental Management for Sustainable Universities (EMSU) 2002 Conference.* Grahamstown, South Africa: Rhodes University.

Filho, W. L. (2000). Dealing with misconceptions on the concept of sustainability. *International Journal of Sustainability in Higher Education*, *1*(1), 9. Available ProQuest Information and Learning Company [May, 2002].

Haddad, C. (Chief Ed.) (2005). A situational analysis of education for sustainable development in the Asia-Pacific region, UNESCO Asia and Pacific Regional Bureau for Education, Bangkok. Retrieved February 2006, from http://www.unescobkk.org/index.php?id=993

Hesselink, F., van Kempen, P. P., & Wals, A. (Eds.) (2000). *ESDebate: International debate on education for sustainable development.* Gland, Switzerland and Cambridge, UK: IUCN The World Conservation Union.

Holdsworth, S., Bekessey, S., Mnguni, P., Hayles, C., & Thomas, I. (in press). Beyond Leather Patches (BELP): Sustainability education at RMIT University. In W. Leal & D. Carpenter (Eds.), *Sustainability in the Australasian University context.* Frankfurt am Main: Peter Lang Publishers.

International Institute for Sustainable Development (2005). *Agenda 21.* Retrieved September, 2005, from http://www.iisd.org/rio+5/agenda/agenda21.htm

IUCN. (2004). *What is education for sustainable development.* Retrieved February 3, from http://www.iucn.org/themes/cec/education/whatis.htm

Kliucininkas, L. (2001). Assessment of sustainability: Studies at universities and colleges in Lithuania. *International Journal of Sustainability in Higher Education*, 2(3), 250–256. Available ProQuest Information and Learning Company [May, 2002].

Moore, J. (2005). Barriers and pathways to creating sustainability education programs: Policy, rhetoric and reality. *Environmental Education Research, 11*, 537–555.

Noonan, D., & Thomas, I. (2004). Greening universities in Australia: Progress and possibilities. *Australian Journal of Environmental Education*, 20(2), 67–80.

Orr, D. W. (1992). *Ecological literacy, education and the transition to a postmodern world.* Albany: State University of New York Press.

Ridener, L. R. (1997). University students' attitude to the environment: An Australian/USA comparison and the effects of an educational program. *Australian Journal of Environmental Education*, *13*, 77–84.

Roorda, N. (2002, September). Assessment and policy development of sustainability in higher education with *AISHE. Proceedings of the Environmental Management for Sustainable Universities (EMSU) 2002 Conference.* Grahamstown, South Africa: Rhodes University.

Rowe, D. (2002). Environemtnal literacy and sustainability as core requirements: Success stories and models. In W.L. Filho (Ed.), *Teaching sustainability at universities: Towards curriculum greening* (pp 79–104). Frankfurt: Peter Lang, Frankfurt.

Royal Australian Institute of Architecture (1995). *Environmental design guide.* Melbourne: RAIA.

Second Nature (2002) *Resource center.* Retrieved May 22, from http://www.secondnature.org/resource_center/resource_center.html

Sterling, S. (1996). Education in change. In J. Huckle & S. Sterling (Eds.), *Education for sustainability.* London: Earthscan.

Sterling, S. (2004). Higher education, sustainability, and the role of systemic learning. In P. B. Corcoran & A. E. J. Wals (Ed.), *Higher education and the challenge of sustainability: Problematics, promise, and practice.* Dordrecht: Kluwer Academic Publishers.

Thomas, I. (2003, October). The green university curriculum. Proceedings of the *Green University Workshop*. Taiwan: National Kaohsuing Normal University.

Thomas, I. (2004, June). *Factors that Facilitate Curriculum Change for Sustainability Education.* Workshop paper presented to Environmental Management for Sustainable Universities, Technolologico de Monterrey.

Thomas, I., Kyle, L., & Alvarez, A. (1999). Environmental education across the curriculum: A process. *Environmental Education Research*, 5(3), 319–337.

Thomas, I., Kyle, L., & Alvarez, A. (2000). Introducing environmental literacy in the tertiary curriculum. *Australian Journal of Environmental Education*, 15/16, 95–101.

Thomas, I. G., & Nicita, J. (2003). Employers' expectations of graduates of environmental courses: An Australian experience. *Applied Environmental Education and Communication*, 2, 49–59.

Tilbury, D., Keogh, A., Leighton, A., Kent, J. (2005). *A national review of environmental education and its contribution to sustainability in Australia: Further and higher education.* Report prepared by Australian Research Institute in Education for Sustainability (ARIES) for the Department of the Environment and Heritage, Australian Government, Sydney. Retrieved from http://www.aries.mq.edu.au/project.htm

University Leaders for a Sustainable Future (2001). *History.* Retrieved April 1, from http://www.ulsf.org

University Leaders for a Sustainable Future (ULSF). (2005). *Talloires declaration signatories list.* Retrieved September 20, 2005, from http://www.ulsf.org

Wolfe, V. L. (2001). A survey of the environmental education of students in non-environmental majors at four-year institutions in the USA. *International Journal of Sustainability in Higher Education*, 2(4), 301–315. Available ProQuest Information and Learning Company [May, 2002].

Wright, T. S. A. (2002). Definitions and frameworks for environmental sustainability in higher education. *Higher Education Policy, 15*, 105–120.