

Greening Universities in Australia: Progress and Possibilities

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Abstract

The greening of universities has been on the international agenda for at least a decade. While there has been considerable activity at some universities overseas, progress in Australian universities has been less easily identifiable. Also, the term 'greening' has often been taken to apply to the operations of a university, whereas the universities' curricular should also be examined. After providing a background to the greening of curricula and operations, this article presents an overview of the current status of Australian universities. The relatively poor progress is discussed in the context of the issues associated with bringing about change in universities, and some proposals are made for facilitating change.

Preface – Explanation of Terms

When we are discussing curriculum that emphasises awareness of environmental issues, understanding of how to improve environmental quality, and appreciation of the connections between environment, society and economics, then several terms may be used. Over the past decade different terms have been used in some countries, and for slightly different reasons to express the three points above. These terms include green curriculum, green agenda, environmental literacy, Triple Bottom Line literacy, education and sustainability education.

Over the past decade we have seen an evolution in curriculum discussion that has paralleled the move from a focus on the bio-physical environment to the inclusion of the other two recognised aspects of sustainable development, that is, society and economics. Those of us working in the environment and sustainability fields will be aware of the differing meanings that are provided by the above terms, and may wish to engage in debate over the subtleties involved. Even so there is overlap in the use of the terms. For instance, Strauss (1996, p. 8) notes:

An environmentally literate person recognises that human actions have complex ecological and normative consequences. He or she has the motivation and education to investigate and pursue courses of action that contribute to a more sustainable future.

For our colleagues in other fields the distinctions are not as important, and there is a strong tendency to use the terms as if they were one. While discussion of sustainability

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curriculum has advanced, the emphasis in the operations of universities is predominantly on environmental management. Although some Australian universities are beginning to address issues such as triple bottom line reporting, specific issues relating to social and economic sustainability in university operations are outside the scope of this paper. When discussing the greening of university operations we refer predominately to environmental sustainability. A further complicating issue is that the data that we have drawn on, related to both operations and curriculum, comes from a variety of sources that utilise a range of terms. While the differences in these terms are important, for the purposes of this paper we will use the term “greening” to encompass the range of activities at universities.

The Context for Green Universities

There is clear justification for ensuring that tertiary curriculum educates students regarding the environment and sustainability, and that the operations of the universities follow environmental principles. The general community has identified the need to take account of the impacts of our activities on the environment, while the business community and professional associations see the need to take better care of the environment (Thomas, 2002). Clearly there is a need for graduates to develop an environmental “literacy” as part of their tertiary education. For two decades many students have had a broad environmental awareness when they come to tertiary institutions (Ridener, 1997), but this does not necessarily give them the ability to assess environmental issues and take appropriate action. To a degree, this deficiency is redressed by the increase in specialised tertiary environmental programs over this period. (Cosgrove & Thomas, 1996; Wolfe, 2001). However there have been calls for a better coverage of environmental matters and for environmental education to have a higher profile at tertiary institutions (Victorian Government, 1987; Commonwealth of Australia, 1994; Environment Australia, 2000).

There has also been an expanding worldwide interest in “greening” the operations of universities. This move follows similar actions to ensure the operations of commercial businesses, government departments and our homes are less environmentally demanding. This interest and action has tended to focus on reducing the consumption of resources (eg. energy, water, paper) and on reducing the release of pollutants (eg. air emissions, solid waste, noise). These ideas have coalesced into the concept of “Cleaner Production” by the United Nations Environment Program (UNEP, 1999). Cleaner Production has been targeted at commercial organisations, but its concepts and aims are equally applicable to other organisations, such as universities.

There has been increasing support from across the community for the implementation of environmental literacy in universities (Thomas et al., 1999). At an international level this movement has been facilitated by the development of several initiatives aimed at the tertiary sector (Thomas, 2002). Of particular note is the Talloires Declaration, a program of the University Leaders for a Sustainable Future, which has been signed by over 290 institutions since 1990 (ULSD, 2003).

To support curriculum change, the meaning of sustainability education must be considered. This issue is covered in Filho (2000) and Thomas et.al. (1999) and (2000). In Orr’s (1992) words, “education for sustainability” contains several aspects: the need to accept the probability of survival of our species; an attitude of care or stewardship - particularly an “... uncompromising commitment to life and its preservation” (p. 133); the knowledge necessary to comprehend the inter-relatedness, of “... disciplines and of the disparate parts of personality: intellect, hands, heart” (p. 137); and the practical competence required to act on the basis of knowledge and feeling.

These key elements are also the basis of environmental education, expressed in its broad sense, and of environmental literacy (Thomas et.al., 2000). Broad pedagogical models to achieve this literacy have been discussed by Dyer (1996) and Woods (1994). In summary, they involve the addition of environmental issues in an existing course, through to integrating environmental discussion into all courses. To support these models, curriculum structures and materials are required. These materials are readily available (for example Alvarez & Kyle, 1998; Second Nature, 2002), however, 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 that the majority of graduates have literacy in sustainability.

So far we have focused on tertiary curriculum, however “greening” has most frequently been associated with the operations of universities, that is, the management of the universities physical assets and built environment.

The greening of university operations has been on the agenda in Australia in various forms for many years, however, the agenda gained significant momentum in the mid to late 1990s in parallel with the wider community’s growing understanding of environmental issues. This growing awareness is demonstrated by Alabaster and Blair (1996), and Creighton (1998) who discuss the role of universities in sustainability, while Thomas (1999) provides an illustration of the activity at RMIT.

In 1995, as part of the growing momentum, there was an initial attempt to establish Australian wide communication amongst the small number of staff employed specifically in roles related to campus greening. This network, known as the Australian University Environmental Managers Network (AUEMN), established a central website and attempted to keep in contact through an email network. The network has evolved in recent years due to a larger critical mass of nation wide staff, and has held three successful conferences focused on campus greening. It continues to maintain a dialogue through an email discussion group and has established an interactive website. The website, found at www.acts.unsw.edu.au, provides a forum for people who are interested in campus greening to share experiences and to discuss common issues. A perusal of the website shows that there are a growing number of environmental projects being implemented at universities around Australia. Projects related to energy and water management, waste reduction and recycling are some of the more common initiatives. To include green initiatives at TAFE facilities, the network is now known as the ACTS Network, Australian Campuses Towards Sustainability.

The Extent of Green Curriculum in Australian Universities

A survey of Australian tertiary institutions by Carpenter and Meehan (2002), with a response rate of only ten (out of a possible 38) indicated that for the majority of universities, environmental management was not a key activity. For most of the institutions, the specific teaching and research activities were connected to environmental principles. However, only one university made a specific reference to “greening” the curriculum.

A parallel but unrelated survey with responses from 21 institutions (almost two-thirds of Australian institutions) found considerable confusion over the concept of sustainability education (Thomas & Nicita, 2003). In part this may have been associated with Filho’s (2000) observation that the concepts of sustainability and sustainable development are contested. His investigations indicated that people in the institutions sampled in his study thought:

- sustainability is too abstract, or too broad;
- institutions have no personnel to deal with sustainability;

- sustainability demands substantial resources that institutions either do not have or can not justify; and
- sustainability lacks a scientific basis.

Nonetheless, at the time of the survey in late 2000, the majority of responding institutions said education related to sustainability was covered in their curricula. This is a good start, however, only a small minority replied that sustainability education was included in all disciplines. The results indicated there was a general appreciation that sustainability education has a clear place in tertiary curricula, but only a handful of Australian institutions had incorporated it extensively or were working to that point.

A web-based survey and a written questionnaire survey was conducted by Bekessy and Burgman (2001) to gain an understanding of the environmental practice in Australian universities and a selection of international universities. They specifically sought information about the institutions' operations and curricula and concluded "that most universities in Australia and elsewhere in the world have moved significantly towards sustainable practices in recent years" (p. 2). Regarding the curriculum, a slight majority of Australian institutions responded that the extent to which courses addressing sustainability within their institution was either "quite a bit" or "a great deal". Responses related to the integration of environmental knowledge, values and ideas into courses across institutions. They indicated that participation was at a low level with less than a quarter indicating integration was at a level commensurate with the two highest descriptors being "quite a bit" or "a great deal". If the confusion that was apparent in the 2000 survey (above) still exists, the level of participation reported by Bekessy and Burgman (2001) could be even smaller. Further, as an adjunct to the limited curricula coverage of sustainability, Bekessy and Burgman (2001) found that funding to students or departments, as an incentive to take or offer environmental studies, was generally low. In the recent past little has changed.

While the number of Australian universities signing the Talloires Declaration has increased to eight, some of those who have signed this Declaration do not publicly indicate on their websites any interest in green curriculum. This is significant because, by becoming a signatory to the Talloires Declaration a university commits, as the first of ten specified actions, to:

Use every opportunity to raise public, government, industry, foundation, and university awareness by openly addressing the urgent need to move toward an environmentally sustainable future (ULSF, 2003).

A survey of the eight universities' web sites, conducted by the authors in March 2003, indicated that few are taking action to improve the environmental management of their operations, while consolidated interest in a green curriculum that is across disciplines and the university is even less evident. The survey results are based on what the universities have emphasised on their "home pages", and by searching for publicly displayed information using the key words "green", "environment" and "sustainability". Encouragingly, the results did show that well over half the universities offer subjects and courses related to environmental literacy, even if there is no evidence of an overall green curriculum for the university. Also, about half indicate that there are staff members interested in environment and sustainability, and that related projects and activities have been undertaken. Importantly, the University of New South Wales has indicated its support for a green curriculum (across the University) by making a booklet available entitled "Education for sustainability" for use in many disciplines.

The University also has a “Sustainability Teaching Grant” to encourage curriculum development.

The results of the survey also indicate that the term “sustainability” has been incorporated into the activities of most universities. However, on viewing university websites, there is little indication that the underlying principles of sustainability, (incorporating social, environmental and economical sustainability), have been understood or implemented. Rather, “sustainability” is likely to be used to promote a different idea. As an example, RMIT’s recent “Dissolving the Boundaries: Building a Sustainable RMIT, Strategic Plan and Direction to 2006” emphasises economic outcomes (RMIT, 2003), while environmental matters are barely acknowledged.

Clearly the results of these recent surveys indicate that the adoption of sustainability education, that will empower all tertiary students in Australia, is at a low level. This suggests there are still substantial barriers evident in the Australian tertiary system.

The Extent to which Operations at Australian Universities are Green

A number of the surveys, including those discussed previously, seek to benchmark the current status of campus greening initiatives. Discussion under the following themes illustrates the progress.

Staff Dedicated to Greening

A survey conducted by Nolan (2002) found that across the “Group of Eight” universities and the five Australian Technology Network Universities in Australia, there are 28.5 effective full time positions dedicated to the greening of campuses. The location of these positions within the university structure varies among universities, however the majority sit within the facilities management area or departments responsible for occupational health, safety and environment.

The number of staff employed in campus greening has significantly increased since the creation of AUEMN in 1995. If nothing else, the increased number shows that there is at least an in-principle agreement in universities that institutions need to improve the environmental performance of their operations. However, the degree of success in institutionalising the principles of sustainability appears to vary significantly across Australian universities, as will be discussed.

Committees

Carpenter and Meehan (2002) found that of the 10 universities surveyed for their environmental initiatives, six had formally established environmental management committees while four had no committee structure. The need for senior staff of an organisation to drive environmental management is a common theme of those who promote environmental change in universities.

Environment Policies

Of the universities surveyed by Bekessy and Burgman (2001), only about half had dedicated environment policies, indicating that interest in environmental management generally was not a significant issue for tertiary institutions. This is at odds with the finding in a recent survey conducted by the Business Council of Australia which found that environmental sustainability is an issue of major significance to young people in Australia. The subsequent report found that:

The environment was the most important issue for respondents. By a significant margin, it was the most commonly listed challenge perceived to be facing the community and the government over the next 20 years. (BCA, 2003)

Funding Allocation

The level of funding and the method in which funding is allocated for environmental programs varies significantly across Australian universities. Carpenter and Meehan (2002) found that of the 10 universities they surveyed, only one had a dedicated budget used to further the goals of the university's environmental plans. The Australian National University is reported in Carpenter and Meehan (2002) as dedicating \$2 million over ten years to fund specific initiatives identified within its environmental plan. It is the view of the authors that staff are more likely to be motivated to become involved in and implement environmental initiatives if there is a commitment to funding shown by the university. There is an obvious correlation between funding and resulting activity as evidenced by the progress in environmental management being made by universities such as The Australian National University.

Issues Being Addressed

A review of Australian university websites and literature shows that the most significant area being addressed under the heading of environmental sustainability is energy management. Of the universities surveyed by Nolan (2002), all professed to have some sort of energy conservation activity. The survey also showed that there was some activity around issues such as waste and water management, building design and green office programs. However, the survey did not show the extent to which these programs are being successfully implemented. Further investigation is therefore required to determine the real extent to which issues are being addressed at Australian universities. RMIT University for example has made a number of public environmental commitments to address energy consumption. However few resources have been allocated to meeting these commitments and as a result, although the University does conduct some activity in energy management, the real environmental gains or improvements have been minimal. RMIT's recent Annual Reports show that since becoming a member of the Australian Greenhouse Challenge, RMIT has produced a consistent growth in energy consumption and therefore greenhouse gas emissions. This demonstrates the discrepancy between verbal environmental commitment and actual environmental progress.

One possible indicator of systematic implementation of environmental initiatives could be the existence of an environmental management system (EMS). Commitment to such an initiative demonstrates a wide-spread and multilevel attempt at environmental change. Of the 13 universities surveyed by Nolan (2002), 31 per cent indicated they were implementing an EMS.

Considerations for the Development of a Green University Curriculum

Previously we have mentioned several reasons for greening university curriculum and operations. Associated with these are some immediate pressures for change. In particular, the rapidly growing adoption of Environmental Management Systems (especially ISO 14001) combined with the need to manage climate change means that there is a need to ensure that graduates are literate in these matters.

There are four main stages to achieve the conversion to a green university:

- acceptance of the need to become green;
- access to information about the environment so that it can be included in the curriculum and operations;
- for curriculum, access to the educational ideas and models that enable the environmental topics to be presented in the context of environmental education; for operations, access to working models and examples; and

- processes for helping staff to change themselves, their curricula, and their practices.

These issues are discussed by Thomas (2002), however the key point is that of developing processes for change. Change is usually slow and often resisted, so we need to recognise the factors that influence change; especially the factors that are likely to act as barriers. In a recent review of experience in universities, Filho and Wright (2002) have grouped these barriers into the following categories:

- governance issues – external influences (such as a board of management with appointees of the government) and a split in decision-making structure (where a Board of management represents government and other interests, but another body of senior academics is responsible for all academic matters);
- issues of advocacy and leadership – advocacy is often most effective when initiatives are promoted by both top-down and bottom-up activities of staff; also the active support of key administrators and executive staff is a crucial element in delivering change;
- communication – to develop awareness, consensus and understanding amongst all those involved;
- economic challenges – to find money in the current climate of fiscal restraint, and where there is a business model of higher education that combines long with short term thinking; and
- policy inadequacy – policies may be good statements of the intentions of a university, but implementation and accountability processes need to be included.

These barriers provide clear directions for the focusing of effort if we are serious about changing university curriculum and operations.

Considerations for the Development of Green Operations

The Nolan (2002) survey shows that a number of Australian universities have had a public commitment to environmental sustainability for almost ten years. Observation suggests, however, that progress in implementing environmental initiatives at some universities has been slow and ad hoc. Two suggested reasons for this are offered, the first being a limited understanding as to what a strategic commitment to sustainability involves. Bekessy & Burgman (2001) found that 55 per cent of Australian universities surveyed have specific environmental or sustainable development policies, however, only 11 per cent of universities are ISO 14001 accredited. Although one cannot draw definite conclusions from this, the data suggests a discrepancy between the superficial commitment to policy and the deeper commitment to implementation. RMIT University for example is signatory to a number of external commitments, including: The Talloires Declaration; The Greenhouse Challenge; The Global Compact; and, Waste Wise Organisation. However, to date, there has been no management line accountability or established funding for implementing these commitments. At the time of writing there was no staff position responsible for overseeing the environmental programs of the University and funding for implementation of initiatives was sought annually on a specific project-by-project basis. This situation is not conducive to environmental progress being made.

The second possible reason for the slow and ad hoc implementation of sustainability could be the lack of business planning for sustainability at the executive level, resulting in an under allocation of resources for project implementation. The authors have observed that a significant number of Australian universities employ environment or sustainability coordinators, however, these positions are often situated at a relatively non-senior level and “buried” in isolated departments of the university. In these cases

the coordinator may not be in control of a budget and is therefore unable to plan strategic implementation of environmental programs. Also, in the authors' experience, there is a risk that the coordinator position becomes one of project management, where the coordinator creates and implements projects to address environmental issues, but these are not integrated into the overall strategic planning of the university. This may result in the implementation of a successful project, but failure to embed the principles of sustainability into the operational process of the organisation. There is also a risk that the process becomes one of addressing small environmental "spot fires" while larger environmental issues continue across the remainder of the organisation.

Confronting the Barriers to Change

Recognising that the introduction of green curriculum and operations requires a conscious effort to change the behaviour of staff, a number of individuals and institutions have tried several approaches to lead change. The following provide an overview of elements that have been identified as leading to success in individual institutions:

- Creation of a sustainable development policy/programme to guide the institution (eg. a management strategy which incorporates sustainable development as a strategic aim) (Apple, 2002; Ferrer-Balas, 2002; Rowe, 2002);
- The support of the executive board (or people) is a crucial condition of success in a process of integrating sustainable development (Apple, 2002);
- The support of executives of departments and institutes (professors), of lecturers, and the support of faculty boards and lecturers is crucial (Apple, 2002);
- Responsibilities for implementation being allocated, through a co-ordinator or advice committee (eg. Environmental Advisory Committee), and funding being provided (Apple, 2002; Bartlett and Eisen, 2002; Coull, Jerman, Elzerman & Schmidt, 2002; Downey, 2002; Waas and Sys, 2002);
- Having a well recognised framework (policy, declaration or charter) such as the Earth Charter and Tallories Declaration, to provide the context and justification for the change is important so that people feel they are fitting in with recognised actions (Blaze Corcoran, 2002; Sammalisto, 2002);
- Provide staff development opportunities such as organising conferences and workshops to help academics develop an understanding of sustainability so they can add material to existing courses or develop new courses (Coull et.al, 2002; Ferrer-Balas, 2002; Malhadas, Telles & Garcias, 2002; Sammalisto, 2002). This is emphasised by Rowe (2002, pp. 86–87):
 - ... professional development opportunities for faculty seem to be a key component for success. Professional development is needed for faculty to learn about sustainability, to develop and refine their course revisions and to share and learn from each other's attempts to incorporate these concepts into their courses;
- Provide manuals, (with "model" material), to assist lecturers in the introduction to the study of environmental issues and sustainability (Ferrer-Balas, 2002; Sammalisto, 2002; Rowe, 2002);
- Encourage individual departments and schools to produce a "curriculum greening plan" (Ferrer-Balas, 2002; Roorda, 2002); and
- Involve professional associations and former students in establishing a "curriculum greening team" with clear mandates to develop the curriculum greening plan (Ferrer-Balas, 2002).

Elements of these initiatives are summarised by Creighton (1998) (see Figure 1) which provides practical directions for change. However, individually they will not lead to a green university. Rather a combination of actions that relate to the particular situation of the individual university will be needed. Importantly, all of these initiatives are part of the general movement for the implementation of organisational change within the university and in particular for curriculum reform.

Limited change has occurred, as clearly the Australian university sector has made some progress in addressing environmental sustainability within its own operations. Over the past ten years a growing number of staff have been employed specifically to work on campus greening. Policies have been written and occasionally universities have begun to reduce some of their negative impact on the environment. However, there is a clearly widening divide between the universities that are making progress and those that are not.

The universities making progress are planning for environmental sustainability at the most senior levels. They have made the business decision to address their resource consumption, waste production and treatment of habitat biodiversity – (if not to be a good citizen then for the economic gains that can be achieved). Working towards environmental sustainability results in a university achieving financial savings in resource consumption. Just as importantly, it also provides a working laboratory for teaching and research around issues of sustainability. This attracts both students to contribute back to their own university, and much needed research funding.

Although specific data is difficult to obtain, observation suggests that the more successful examples of operations greening within Australian universities show three major factors, which seem to have determined their success so far:

- There was a strong business case presented during the initial developmental stages of the environmental program. This appears to have ensured that the development of policy lead to a clear and committed path to implementing the issues highlighted in the policy;
- The Vice-Chancellor or delegated senior executive is highly involved in the implementation of the environmental commitments. For example they chair a steering committee or have direct responsibility for the budget; and
- There is a dedicated and autonomous budget allocated for the implementation of the environment programs.

The third point is crucial to the successful implementation of environmental policy, particularly in the operational area of a university. Typically operational projects are funded based on their short-term financial merit, or in some cases the need to meet legislative requirements such as Occupational Health and Safety issues. In these situations, environmental projects are put in the “nice to do” project basket, and are the first to lose their funding when budgets are tight. Although such a process has still resulted in a number of interesting projects being carried out at universities in Australia, it is hardly a process for strategic implementation of sustainability. The adoption of sustainability by universities will be hindered by the trend towards a business model in higher education where students are regarded as clients, and short-term thinking and competition are promoted over long-term vision (Yencken, 2003)

Change in an Organisation

The development of improved environmental management in business organisations provides some general directions for what may be expected in universities (see Thomas, 2002). However, universities are complex organisations. Their diversity of activities and the individuality of academics makes it difficult for top management to

Barrier – The administration is sceptical and lacks commitment*Possible actions –*

- identify the commitment of other institutions (e.g., Talloires Declaration)
- demonstrate benefits to the university: enrolments, reputation, economics
- put the words in their mouths (push the priority of greening)
- have them attend meetings of the environmental group/committee
- do not wait for commitment from the top – take some actions to show what can be done.

Barrier – Difficulty of turning a broad statement of commitment into tangible activities*Possible actions –*

- divide activities into manageable projects
- focus on a building, department, or part of the university rather than a broad issues (e.g., waste, energy)
- use small working groups
- develop specific actions, rather than general concepts, with targets, costings and responsibilities.

Barrier – Setting priorities when there are so many important issues*Possible actions –*

- focus attention on where there are opportunities, e.g., willing people, expertise, compatibility with other activities
- select a project because it will succeed, to provide momentum for subsequent projects
- do not expect a general audit of the university to help set priorities
- select a local, state, or national goal or policy, and pledge that the university will do its part.

Barrier – Staff lack interest and/or commitment*Possible actions –*

- there will always be some staff who are interested – find them and work with them
- staff members are the driver for change, so work with them
- publicise the actions of staff – give generous credit to empower individuals and groups (use all forms of media and information dissemination)
- show staff how their current actions have environmental benefits
- provide opportunities for staff to show the good things they are already doing
- ask for ideas to reduce environmental impacts of the university (get people to tell you what is needed rather than telling them what to do)
- recognise and respect the demands on staff time (e.g., cleaning rooms, changing lecture material).

Barrier – Many students, and staff, are apathetic*Possible actions – lead by example*

- make change easy for them
- be specific about the actions you want them to take
- find students or student groups with similar interests and priorities.

Barrier – An audit of the university (or review of environmental issues) is taking a long time*Possible actions –*

- make sure you know the purpose of the audit, and how the information will be useful (e.g., for guiding specific actions rather than broad policy)
- realise that a general campus audit may not be helpful in setting priorities for projects (since many important issues will be identified)
- target the audit efforts to the level of detail needed (e.g., information on the number of “green” subjects will be of little help in changing the curriculum of a department)
- encourage audits of specific issues and parts of the campus, to help provide directions for specific projects.

Barrier – Some efforts or programs start with a bang and fizzle out*Possible actions –*

- do not worry the fizzle may be a sign that the time is not right, or the action chosen is not right
- focus on actions that will work find the best people to champion them
- stay committed
- be action-orientated, to move beyond concepts
- see if the head of the department, faculty, campus will support the actions, and set some proposals for the “greening” staff or committee.

Barrier – The university community is uneducated about the environmental issues*Possible actions –*

- make the education on-going, through regular communications and/or training/projects
- use existing communications modes that reach the students and staff
- make education an integral part of any project
- encourage student groups to conduct awareness activities.

Barrier – There is never any funding to implement the projects*Possible actions –*

- try to link environmental activities with other programs
- capture savings realised from avoided costs to fund other projects (e.g., savings from reduced waste collection, resulting from a recycling program, for energy projects)
- use student projects to research options, implement parts of projects, and monitor activities
- use the campus to demonstrate new technology or processes developed by staff members and students
- spread the work try to find appropriate places for environmental responsibilities (e.g., in the responsibilities of “traditional” jobs).

FIGURE 1: Barriers, and Proposals for Greening a University (After Creighton, 1998; Box 9.1)

direct change, since guiding academics who prize their individuality, analytical skills and creativity would be like “herding a mob of cats” (a difficult if not impossible task).

In an attempt to encourage these “cats”, there are many proposals for how to develop green curricula in universities (see Thomas, 2002). However the key issue for change has been succinctly stated by Walton (1995; p. 151):

Full and complete change means changing peoples' *behaviour*, and that inevitably means changing ...the values, culture, climate, informal operating style, rituals, communications patterns, and so on ...

In a traditional analysis of organisational change we would expect the direction for change to come from the top (management or academics). At the same time there are many indications that for the sort of changes we are discussing, a “bottom-up” approach will be important. A fundamental element of such change will be the support that staff are given to make the changes, specifically the extent to which staff training and development is provided. As Thomas (2002) indicates, there is no shortage of suggestions and examples for how staff development can be undertaken. The deficiency seems to be the inability of universities to accept the need for these programs, and especially to implement them.

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