The UNSW Ecoliving Program – integration of teaching, research and community outreach for urban sustainability

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Abstract

The University of New South Wales (UNSW), located in inner-urban Sydney, Australia, has developed a strong sustainability profile in its teaching, research and campus operations. This paper discusses the background and achievements of the UNSW Ecoliving Program, established in 1999 to provide a ‘living laboratory’ for accessible, ecologically sustainable urban living as a dynamic learning resource for the University and the wider community.

A crucial element of the program was the establishment of a participatory, multi-disciplinary decision making process which involves all stakeholders and places central importance on learning itself. Refinement and documentation of this process (as well as creation of tangible products) has been identified as a key outcome in terms of the Program’s ongoing educational value.

The Program operates from a University-owned house and adjacent permaculture garden close to the main campus. Involvement of local residents, NGOs and groups with special needs is seen as central to the concept of sustainability as well as to the Program’s success. The site provides a resource for students and staff from a diversity of disciplines and members of the general community to engage in collaborative and individual environmental management/design related projects. It also provides a showcase for various aspects of urban sustainability practice and a physical base for tours, workshops and seminars for educators, policy-makers and the community.

A major objective of the Program is to ensure that design elements and systems are both accessible and transferable to other sites and situations. Through evaluation and continual improvement, it is intended to accumulate a knowledge base which can be used to inform future works – on the existing site, on the UNSW campus and in the broader urban context.
1 Introduction and context

The Sustainable City 2000 conference emphasised that “sustainable urban development is all about diversity and taking many small steps, each one as necessary and legitimate as the other” [1]. Sustainability education may be seen as building the road which enables such steps to be taken with confidence.

Within the broad domain of education for sustainability, universities have particular, and crucial, responsibilities. Universities’ influence does not end with undergraduate and postgraduate learning; it extends to conferences, community outreach activities, vocational short courses, international education, and the influence on students and graduates in their domestic as well as working lives [2].

Awareness is growing in the higher education sector that universities can teach and demonstrate the theory and practice of sustainability through taking action to understand and reduce the unsustainable impacts of their own activities [3,4,5,6]. Linkage of curricula and campus operations under the aegis of sustainability can create a powerful ‘shadow curriculum’ [2] which emphasises the nexus between theory and practice.

The Federal Department of Environment and Heritage identifies a range of formal and non-formal environmental education (EE) providers, the latter including business, the media, environmental interest groups and other community organisations [7]. Coordination and integration, including the development of partnerships between formal and non-formal providers, are seen as crucial to enabling a systematic approach to education for sustainability [7,8].

Community-based sustainability centres represent a numerically small but influential component of the non-formal EE sector in Australia. A typical centre is funded through a mix of grants and fee-for-service activities and run by a combination of professional staff and volunteers to deliver a range of educational and training experiences [9]. Such centres traditionally have close links with schools and local government; however, although considerable experience has accumulated with respect to university sustainability outreach initiatives both internationally [6] and in Australia [10,11], ongoing relationships between community-based environmental centres and universities are uncommon.

The University of New South Wales Ecoliving Program was established in 1999 to provide a ‘living laboratory’ for accessible, sustainable urban living. It combines the functions of a University centre which links curricula with campus operations, and a community centre focussed on sustainability education. This paper examines Ecoliving within the context of urban sustainability, as a case study and model for the integration of theory, application and demonstration in the quest for a more sustainable city.

1.1 The University of New South Wales (UNSW)

UNSW was founded in 1949, and currently includes 75 schools across eight faculties, 78 research centres and eight residential colleges. The student population is approaching 35,000, with close to 5000 academic, administrative and operational staff. The main campus covers 38 hectares and is located at Kensington, a coastal suburb six kilometres from the Sydney CBD.
By the early 1990s UNSW had established a reputation for environmental innovation, both in teaching and research and in the management of its own facilities and operations. UNSW was the first Australasian university to sign the Talloires Declaration (an international commitment to sustainability in higher education) [12], and the first university to join the Australian government’s ‘Greenhouse Challenge’ greenhouse gas abatement program [13].

In 1995 the University’s governing Council adopted an Environment Policy (revised in 2000) which commits to ‘strive for environmental best practice...[and] lead the way in developing environmental best practice utilising the intellectual and research capabilities of the University’ [14]. In addition it highlights the University’s outreach role to ‘promote the principles and practices of environmental responsibility by sharing knowledge and experience with other universities, government and private organisations and community groups’ [ibid].

1.2 The UNSW Environment Management Program

The Environment Management Program (EMP) was established in 1995 to facilitate implementation of the Environment Policy, under the strategic direction of a high-level Advisory Committee. The role of the EMP unit has evolved to address aspects of the entire mission of the University – operational, teaching, research and outreach – and thereby to introduce an element of integration, through developing connections between academic and operational staff, students and the wider community. In summary, the Environment Management Program initiates and participates in activities which facilitate a synergy between environmental learning and the learning environment. Its current areas of responsibility currently include:

- The Recycled Organics Unit (New South Wales centre for organic resource management, information, R&D, demonstration and training);
- The Green Office Program, designed to introduce environmentally responsible products and practices to UNSW offices;
- Greenhouse Challenge (strategic planning);
- The University’s Environmental Auditing course (run jointly with the School of Safety Science);
- Internal advice and external consultancy on environmental design/management;
- The Ecoliving Program, which is the focus of the remainder of this paper.

2 History of the Ecoliving Program

In 1993 a group of environmentally active students persuaded the University to release an area of unused land for a permaculture-based community garden (see section 2.2 below). Over the following five years the garden was developed and used as an informal teaching resource by the students and some local residents.

The garden’s popularity led to development of a proposal to seek funds for the conversion of an adjacent University-owned house into an ‘ecoliving laboratory’ to enhance and extend the scope of activities and to consolidate links with the
University’s teaching and research agenda. In 1998 the garden volunteers and the then UNSW Environment Program Manager prepared a successful submission to a philanthropic trust for grant funding to cover the salary of a Coordinator and initial retrofitting of the house to meet environmental design objectives. The University’s contribution consisted of the house, land and administrative support.

2.1 Development of the Ecoliving concept and objectives

The original Ecoliving proposal stressed that a successful program should not only facilitate environmental learning at UNSW, but create a working model of sustainable urban living, an invaluable educational resource for people outside the university system [15]. The following objectives were incorporated into a revised brief [16], and form the strategic basis against which the success of the Program may be assessed:

- Establish a participatory, multi-disciplinary decision-making process which involves all stakeholders and places the greatest importance on learning itself. Refinement and documentation of this process (as well as creation of tangible products) is seen as a key educational outcome.
- Utilise this process to develop and trial a range of innovative environmental design interventions relating to land use, waste management and resource consumption, applicable domestically and accessible to the householder.
- Provide a physical resource for students and staff across diverse disciplines to engage in collaborative and individual environment-related projects.
- Evaluate and continually improve both the processes and physical outcomes to accumulate a knowledge base to inform future works - on the existing site, in student residential development, and in the broader community.
It was affirmed that design outcomes should be transferable to other sites and situations. In addition, a periodic ‘reinventing’ of particular aspects of the Program was seen as adding to the educational value, introducing new generations of students and staff to the complexities of environmental design.

2.2 The role of permaculture

The Ecoliving Program is consciously based on the principles of permaculture, reflecting the philosophy and practice of the original community garden project. Permaculture may most simply be described as a system of design for sustainable human settlements [17]. The word was coined in 1978 by Australian ecologist Bill Mollison and his student, David Holmgren, and is a contraction of both permanent agriculture and permanent culture – the latter emphasising that permaculture is founded on a clear-cut set of ethics. These can be summarised as caring for the earth, caring for people, and sharing any surplus while accepting the limits to growth [18].

Permaculture design principles were synthesised from a range of disciplines with the objective of creating systems to provide for human needs, with the diversity, stability and resilience of natural ecosystems [18]. This is achieved (for example) through ensuring each design element performs multiple functions and each function is performed by multiple elements; material and energy cycling from higher to lower uses; paying attention to ‘edge’, scale and pattern. The focus is less on the design elements than on the relationships created amongst them by their relative location in space and time. Mollison explicitly includes economic and social structures to facilitate the evolution of permanent (i.e. sustainable) culture [18], and permaculture design concepts are as applicable to urban settings as to the suburbs or the countryside.

3 The design process

The Ecoliving Program formally commenced in August 1999 on the foundation of the existing Permaculture Community Garden, with a freshly appointed Program Coordinator, a small number of student, staff and community volunteers, an Advisory Committee representing these three stakeholder groups and a newly allocated three bedroom, semi-detached suburban house.

In line with the view that the design process is as fundamental to the educational outcomes of Ecoliving as the physical interventions, participatory decision making procedures guided by permaculture ethical principles were established as the first priority. This approach faced some hurdles as a consequence of the very different conceptions of the Program held by the long-term garden volunteers and new participants, necessitating development of formal conflict resolution procedures. In recognition of these concerns, an externally facilitated ‘design weekend’ was arranged, comprising a visioning process on day one (involving about 40 staff, students, local residents, NGO members and public and private sector representatives) followed by a workshop-based site analysis exercise during the second day. The outcomes of the weekend were handed over to the Integrated Design Team, one of the first project teams to be established.
A team-based approach utilising accepted project management concepts [19] was identified as the best method to ensure implementation of decisions once agreement had been reached through the iterative group process (Figure 2). Demonstrated success using this model convinced the remaining skeptics of its worth. There are currently 18 teams, covering every aspect of the Centre’s activities from energy and water to environmental art and waste management, providing invaluable (and transferable) experience for those involved.

It was recognised that student projects should be managed separately from the critical path for overall site development as even a minor undergraduate project may take some time, and may not always be implementable.

4 Achievements

Simply retrofitting a property to specified environmental standards in the absence of an educational or participatory design agenda can be achieved with alacrity, as the technologies are well understood [20]; the Ecoliving approach implies a long-term perspective. Scarcity of funds and restriction to an existing building have limited the ability to introduce cutting edge environmental design. However, these constraints have encouraged application of the principle of least effort for most gain, recognising that uptake of sustainability initiatives at the urban household level is ultimately dependent on both accessibility and affordability.

4.1 Infrastructure

Infrastructure initiatives completed or underway to the beginning of 2002 include the design and construction of a household greywater recycling system, solar...
pergola and rainwater collection and composting systems, a variety of ‘edible landscape’ projects, enhancement of natural lighting, installation of energy efficient appliances and fittings and application of non-polluting surface finishes. Future projects will include installation of grid-integrated photovoltaics and a composting toilet. The objective of these retrofitting activities is to both trial and showcase the relevant systems and technologies, the former involving monitoring, auditing and evaluation, the latter providing immediate feedback to visitors – and both aspects directly related to the educational role of the Centre.

4.2 Academic projects

Twenty-six undergraduate and postgraduate projects have been completed, covering topics as diverse as community health, ‘green’ architecture, lifecycle assessment, greywater reuse, soil analysis and environmental auditing. Research output has included a paper on greywater reuse presented at the 6th World Congress of Chemical Engineering in 2001. Projects planned for 2002 include development of on-site computerised environmental monitoring systems.

A number of activities have incorporated both academic and community aspects: hosting of the National Seed Savers’ Conference in 2000; organisation of a greywater recycling seminar in 2001; and a seminar in 2002 on ecovillages and ecological economics. In 2001 the Centre also hosted a UNSW/University of Western Sydney collaborative workshop on community environmental health.

In addition Ecoliving plays an important role in non-academic facets of student life, through training in group processes and project planning, and hosting of events and practical activities for students interested in sustainability issues. As well as providing office and meeting space, a resource centre and a showcase for sustainable technologies, the Ecoliving house has been home to a succession of student tenants, with the goal of testing the concept of ‘ecoliving’ in practice.

4.3 Community activities

Outreach initiatives run through the Program have ranged from provision of free and low cost community education courses to participation in major environment-related exhibitions, regular ‘Art in the Garden’ events, provision of gardening as therapy for people with disabilities and frequent school visits.

Community educators and University staff have used the Ecoliving Centre as a venue for a diversity of general interest and vocational courses with a sustainability theme, addressing topics such as passive solar design, organic gardening and natural pest management, strategies for reducing household greenhouse emissions, ethical investment, garden pharmacy and office greening.

More formal connections with public and private sector organisation are also seen as necessary for effective community outreach. Ecoliving has provided a venue for Federal Government job training programs, developed close relations with waste management and sustainable energy agencies, and designed and built sustainable food gardens for a local primary school with a large Aboriginal enrolment in collaboration with the regional Aboriginal Land Council.
4.4 Information and communications

Recognising the centrality of information to both sustainable design and education, a Resource Centre with hard copy and audio-visual material was established early in the Program with support from the University Library. A basic email discussion list for volunteers has expanded into a series of moderated discussion groups relating to permaculture and Ecoliving with about 500 subscribers, supplemented at the end of 2001 with a quarterly electronic newsletter. The capacity for information exchange will be further extended with the launch of an interactive web site in 2002.

4.5 Fundraising and consultancy

In an environment of budgetary stringency for Australia’s universities, obtaining operating funds for the Ecoliving Program has required maximum creativity. Initial funding was achieved via a philanthropic trust, which agreed to fund the program for a second year in 2001. Some small specific project grants were obtained from State and local government sources; however, fee-for-service and consultancy activities currently provide the bulk of the Program’s income. Recent projects include delivery of the household greenhouse gas abatement program ‘Cool Communities’ on behalf of the Australian Greenhouse Office and a consultancy funded by the State Government waste management agency to help establish a similar university/community centre in western Sydney.

5 Evaluation

In purely cost/benefit terms, Ecoliving has achieved significant progress with very limited resources – an annual budget of approximately $80,000 and one full-time employee. In terms of numbers, the Centre attracted about three thousand visitors in 2001, and 1385 people attended 42 seminars and workshops, while more than 100 volunteers contributed nearly 5000 hours of work. On the basis of interest from senior academic staff – and unsolicited praise from students – the Program is extending its reputation as a facility where students can engage in practical academic projects of social and environmental relevance.

Success in obtaining consultancies and grants in a competitive milieu can be seen as a peer evaluation of the expertise both directly associated with the Program and available via its UNSW affiliation. Completion of the western Sydney project referred to above will allow evaluation of the transferability of the Ecoliving concept. Last but not least, the Program has been recognised for its outreach role through several community environmental awards.

5.1 A third party view

The UNSW Environmental Auditing course includes a practical audit component, enabling ‘third party’ evaluation of selected UNSW activities by student auditors. Four audits of Ecoliving were arranged in 2001, covering waste, environmental management systems (EMS) and occupational health and safety (OH&S).
The auditors found that on the whole, sustainable design issues had been addressed appropriately and there were no nonconformances with applicable environmental legislation [21, 22]. It was noted that 97% of solid waste generated on site was reused, composted or recycled. However, auditing against best practice environmental design criteria indicated limitations in incorporating natural ventilation, heating and cooling [21], and in consistent application of lifecycle principles to materials selection [22]. More importantly from a systems perspective, the audits identified deficiencies in communications procedures [21, 22], and ability to meet OH&S standards [23]. It was recommended that the existing non-standard environmental management system be formalised to comply with ISO14001 [24], and that criteria relating to environmental responsibility be incorporated into student tenancy agreements [22]. These issues will be addressed in 2002 before the next audit round.

6 Conclusions – Ecoliving model as sustainable city catalyst?

It is indisputable that education and information are prerequisites for sustainable urbanism. Moreover, humanity’s desire to define its own, sustainable future is increasing at least as rapidly as the global intellectual capital of knowledge, skills and technological tools; hence the sustainability of the city is inseparable from the informed participation of the citizen. A community education perspective also implies that qualitative and experiential knowledge be acknowledged alongside the formal expertise of the professional.

Acceptance of these propositions, consistent with Agenda 21 [25], suggests that linking the attributes of university teaching and research with community-based and practice-oriented sustainability education can create a powerful catalyst for positive change. A program with these characteristics is well positioned to offer practical and socially relevant teaching and research experience for the University, and an accessible and non-threatening example of a ‘work in progress’ towards sustainable urban living for the wider community.

It is not the purpose of this paper to investigate the role of the university in the 21st Century. Suffice to say that it is changing, and the rate of change is increasing. Much is heard about making universities more ‘relevant’; for some this means adopting the corporate or bureaucratic model – or both [26]. The Ecoliving Program suggests there can be another model, one based on a different concept of ‘relevance’, firmly grounded in the ethics of caring for the planet, caring for people, sharing the surplus and recognising the limits to growth [17].

References


