

Sustainable curriculum, sustainable university

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## **Abstract**

"Integrating the principles of sustainable development is a United Nations' goal. One aim of Australia's 2009 National Action Plan for Education for Sustainability is to equip all Australians with the awareness, knowledge, skills, values and motivation to live sustainably in order that future generations can meet their needs. Education is fundamental to enabling people to achieve this goal. Australian universities are starting to address these ideals. With many definitions of sustainability education, grown from environmental education in the 1970s, it is important to offer explanations for environmental, social, economic, cultural and corporate sustainability that show the broadness of the meanings that include aspects of corporate social responsibility. In this paper, some of these meanings are developed and discussed as a starting point for embedding sustainability principles into the ECU curriculum. Key characteristics of a sustainable university are described. Internal and external barriers and drivers to universities becoming sustainable are discussed. This paper also addresses some of the implications of the concepts of sustainability for curriculum design and decision-making. The presentation will provide opportunity for participants to describe some strategies, tips and traps as well as some ideas about assessment. This paper concludes with recommendations for further recognising and showcasing ideas for integrating sustainability throughout the ECU curriculum."

## **Sustainable Curriculum, Sustainable University**

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### **Introduction**

Originally from environmental education in the 1970s, *Education for Sustainability* has grown from an awareness of natural ecosystems and their degradation to equipping all people with the knowledge, skills and understanding necessary to make decisions based upon a consideration of their full environmental, social and economic implications (Department of the Environment, Water, Heritage and Arts, 2009). Australia's first national action plan for Education for Sustainability was released in 2000 (Department of the Environment and Heritage, 2000) and the second (DEWHA, 2009) was released this year. Its aim is to equip all Australians with the awareness, knowledge, skills, values and motivation to live sustainably.

### **What is Sustainability?**

There are many definitions of sustainability with the best known being from the United Nations: *Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs* (World Commission on Environment and Development, 1987).

There are many terms: sustainable development (SD), ecologically sustainable development (ESD), learning for sustainability, education *about* sustainability and education *for* sustainability (EfS) and I will use the term *sustainable curriculum* to encompass them all. A lack of knowledge of what sustainability is and how to do it in a university setting was identified at one Australian university (Bekessy, Samson & Clarkson, 2007). Rather than an operational definition, some explanations of sustainable curriculum within a university demonstrate the broadness of the notion. Sustainable curriculum encompasses both environmental and social sustainability in Edith Cowan University (ECU) documents. This paper serves as a starting point for discussions on how these sustainability principles may be embedded throughout the ECU curriculum.

### **Environmental Sustainability**

Environmental sustainability includes the issues surrounding transport, energy (electricity, petrol, oil, gas, solar, wind, thermal, coal), water, biodiversity (flora and fauna), resources like computers, paper and ink (to reduce their use and their disposal as waste/pollution) and other resources and packaging (being a conscious consumer). Environmental sustainability addresses the issues that environmental education covers. Yet increasingly, social sustainability has a significant role in the sustainability agenda (Hammond & Churchman, 2008).

### **Social Sustainability**

Social sustainability includes Corporate Social Responsibility (CSR) and the issues surrounding the well-being of staff and students like workplace health and safety, ethics, inclusive community, interconnectedness, quality of life, democracy, integrity, respect, partnerships as well as the ability to work in teams as an opportunity to listen and understand other's viewpoints. Social sustainability includes cultural sustainability and corporate sustainability and sometimes economic sustainability. Cultural sustainability includes the issues surrounding diversity of staff and students; equity in recruitment, the workplace and promotion; acceptance of all staff and students; and again, inclusive communities providing a cross-cultural and international outlook. Economic sustainability includes considerations of the short and long-term costs that are not only financial. For any university, economic sustainability specifically means having a viable number of students in each unit or course so that the university is sustainable long-term. However, like any corporation, the cost of a university maintaining any number of students depends on how the assets and services are managed. Corporate sustainability sees that ECU is a corporation, with responsibilities to its staff and students ensuring that all staff and students are able to do their job and/or study well with access to training needs and support provided.

## A Sustainable University

As a university, ECU has the responsibility to teach in such ways that our graduates have the knowledge and skills necessary to live responsibly and also to help transform their workplaces towards sustainable practices (DEWHA, 2009; Ferrer-Balas et al., 2008; Shephard, 2008). A further responsibility is to model how an organisation committed to sustainability ought to operate. ECU has campus “greening” programs, several specialised curriculum units on sustainability, and collaborative research agendas dealing with sustainability issues. ECU is now addressing the need for embedding sustainability issues within curricula across all disciplines.

A “sustainable university” is a university committed to sustainability in more than campus greening programs. Ferrer-Balas et al. (2008) suggest that the literature identifies five notable key characteristics of a sustainable university: transformative education, conducting inter and trans-disciplinary research, a societal problem-solving orientation, networks as well as university leadership and vision that promote proactive responses to society’s changing needs.

Transformative education, that is interactive and learner-centric with a strong emphasis on developing critical thinking skills, prepares students to become capable of addressing complex sustainability challenges whereas transmissive education is often a one-way process of learning (Sterling, 2005; Wals and Corcoran, 2006) and may not develop, assess or reward these attitudes in students.

A sustainable university would have a societal problem-solving orientation in its curriculum. This may be realised partly by engaging with industry and other organisations, where students solve real and relevant problems in all their complexities and uncertainties (Ferrer-Balas et al., 2008). This aligns well with the ECU mission that includes the process of teaching and research being inspired by Engagement and partnerships. External drivers for universities to become sustainable include pressure from peer institutions, funding sources and employment availability with presence of connectors or partnerships with society a key part of the strategy, like the ECU Engagement priority. ECU is accepting its responsibilities as a university committed to sustainability in its campus management and is now addressing the need for sustainable curriculum.

Anecdotal evidence suggests that, in general, academics at ECU seem to be aware of environmental issues as sustainability and aware that these issues are critical global challenges. They were also aware of many of the social sustainability issues like equity, diversity, workplace health and safety, ethics, inclusivity and well being but had not identified these as sustainability issues. Designing a sustainable curriculum is not simply adding some content knowledge into a unit or course but rather it is integrating these principles of sustainability throughout the whole unit or course and delivering the course in sustainable ways.

“The degree to which sustainability content is tokenistic” (Sherren, 2006: 404) is easily checked by answering the question: are the students learning and being assessed on knowledge about the topic or are they becoming equipped with the knowledge, skills and understanding necessary to make decisions based upon their full environmental and social implications?

## **A Sustainable Curriculum**

Sustainable curriculum would be transformative rather than transmissive as its goal to “equip all people with the knowledge, skills and understanding necessary to make decisions based upon their full environmental, social, cultural and economic implications” (DEWHA, 2009) rather than transmissive with a goal to provide students with knowledge. It would not be specialised, content-driven units of study on sustainability but integrated across courses and units.

Sustainable curriculum is based on seven principles: transformation and change (not just knowledge), education for all and lifelong learning, systems thinking (highlighting connections between environmental, economic, social and political systems), envisioning a better future (problem solving), critical thinking and reflection, participation (engaging groups and individuals) and partnerships for change (DEWHA, 2009). It would equip students with the skills to learn and develop their own skills to the changing world. It would be innovative, placing ECU students in the workplace ready for a changing workplace. Students would learn to question, think critically from various viewpoints and make well-informed ethical decisions.

What does a sustainable curriculum look like? Sustainability is a paradigm that requires us all (educators and students) to examine our own values, hidden assumptions, motivations, beliefs and actions (Holdsworth, Wyborn, Bekessy & Thomas, 2008). We (educators and students) reflect on how we live and work and how this impacts the environment, economy and others (social and cultural aspects) on local, regional, national and global levels. We build respect for the planet and what it provides to us (as resources, fauna and flora); conserve and manage resources for present and future generations; build respect for life in all its diversity; use active, reflective, transformative and participative learning strategies; use concrete case studies of local, national or global examples; allow and instigate discussion that exposes students to diverse viewpoints; devise and expect viable solutions to complex problems rather than one and only one way of doing things; consider the consequences (social, economic, cultural and environmental) of possible actions and accept responsibility for creating a sustainable future. Teaching and learning experiences and assessments may need to be different from current models.

Lang (2007) suggests that the ideal approach to design and provide curriculum related to sustainability is to embed the values and principles of sustainability through a whole school approach that reorients existing curriculum rather than an “add-on” approach, a theme or a special event. This style of curriculum design is holistic and integrated.

There are many practical ways that a curriculum could be designed to enhance student participation in thinking about these issues, solve problems, reflect on their own practices and more. There are many instances of best practice of a sustainable curriculum throughout ECU and it is a goal of this presentation to start to identify, recognise and showcase some of those great ideas so that others may learn ways that suit their own units and courses. Pedagogies for sustainability include any strategies that equip students with such decision-making skills and enhance their understandings from the environmental, social, cultural, economic and political viewpoints. They include cooperative, problem-based and experiential learning. This paper

suggests a few practical ideas but does not identify specific units while the presentation will provide opportunity for participants to describe their own good practices.

### **An Inquiry or Problem Solving Approach**

In a sustainable curriculum, students are stimulated to ask questions. This can be very confronting and even time-consuming for some lectures and tutorials. This style does not suit traditional lectures of giving information in which knowledge is emphasised.

Yet if students read selected materials before their lecture, they could participate in a guided discussion during the lecture or tutorial time. Not only reading materials that were provided by the lecturer, students could do literature searches themselves to answer particular questions before a lecture or tutorial so that they could participate. The Blackboard discussion board could be used as a prompting for discussion. Students could be allocated into subgroups in units that have a large cohort. For example, students whose surnames start with A to E could be allocated certain questions or statements while those with surnames starting with F to K could have a different set and so forth. As a starting point for this style, there could be two assessable items during the semester rather than each week. Student could lead the discussion on Blackboard and even assess participation.

Students ask questions as the beginning of an inquiry into a problem perceived to be relevant or hypothetical. Students may investigate the context, write their own learning outcomes and follow their own line of inquiry to research the problem. This may be scheduled as problem-based learning (PBL) tutorials or an amalgam of these methods. This problem solving approach is used when students engage with the community in workplace integrated learning and engagement with the community to produce a useful product as part of their course assessment.

A sustainable curriculum asks questions like: Where did this product come from? How much packaging does it use? Is it biodegradable? Is it toxic? Was it made and disposed of in a way that cares for the environment? Was it made in a way that cared for the people who made it? Was it transported a long way? Do I really need it? What is the impact of this product or process on the environment? Does it reduce the water, energy, paper or petrol used? What is the impact of this product or process on the wellness of other people? All types of people? Here? Now? In the future? What is the financial cost? Now? Later? What is the environmental cost? What is the social cost? Is there a better product or process?

## **Case Studies**

Case studies that exemplify poor or good practices can be equally useful to demonstrate how products, processes and businesses could operate in sustainable ways. Case studies may be hypothetical or real, local or global.

## **Engaging with the Community or Partnerships Approach**

In a sustainable curriculum, connecting with the local, regional or global community is important to find relevance to the topics of interest and problems being solved. Again, this can be very confronting and time-consuming but it can also be very rewarding. In a sustainable curriculum, the focus shifts from the individual to the community. Authentic partnerships may emerge naturally from students' inquiry into their selected interests.

## Learning Outcomes and Assessment

Svanstrom, Lozano-Garcia and Rowe (2009) provide example sets of learning outcomes for university students. On successful completion of a sustainable curriculum in the social sciences, students should demonstrate the knowledge, skills and understanding necessary to make decisions based upon their full environmental, social, cultural and economic implications (DEWHA, 2009) and so they would be assessed on this knowledge, these skills and understanding. They would explain from several viewpoints and provide justification for these viewpoints. They would demonstrate their abilities to identify and solve problems that are relevant to the community;

## Recommendations and Conclusions

There is no proven recipe for success in designing or redesigning curriculum to integrate the principles of sustainability. Sustainability is an ongoing learning-by-doing process that actively involves stakeholders in undertaking change (DEH, 2005). Desha, Hargroves and Smith (2009) list three core phases or methods for curriculum renewal: an ad hoc exploration initiated and driven by staff; the flagship approach that is market driven; and an integrated approach that is institution driven. Several universities are grappling with ways to teach social sustainability to engineering students as decision-making is complex with a number of technical, economic, environmental, social and ethical constraints (El-Zein, Bowden & Clarkeburn, 2008). Recognition of the integrated nature of indigenous cultural values and understanding of the environment (DEH, 2005) would be an important addition to some units and courses.

Sustainability principles can be an impulse for innovation and a vehicle for change. Curriculum change, pedagogy and program content have received much attention from the sustainability agenda (Holdsworth, Wyborn, Bekessy & Thomas, 2008). ECU has values, vision, strategic priorities and mission firmly based on the principles of sustainability and anecdotal evidence that academics support the agenda. These are a strong foundation for curriculum design to integrate sustainability principles.

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