Threshold Learning Outcomes for Environment and Sustainability

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Version and Release Notes

This is **version 0.9.1** of the TLOs (the piloting draft), for piloting against a range of diverse Environment and Sustainability qualifications offered by Australian tertiary education providers in late 2014. **Version 0.9** was redrafted by the Project Team in September-October 2014. Review by the Australian Council of Environmental Deans and Directors (ACEDD) on 16-17 October led to further minor amendments as reflected in **version 0.9.1**.

This piloting draft supersedes the preceding consultation draft (**version 0.8.1**), revised on the basis of stakeholders' comments received through two phases of public consultation. The first phase of public consultation, through June-July 2014, comprised a number of face-to-face workshops and meetings nationally. The second phase of the public consultation, through August-September 2014, comprised invitations to targeted stakeholders to provide comments, an online questionnaire and online discussion forums.

After piloting and presentation to ACEDD for their endorsement, **version 1.0** will be released as part of the *Learning and Teaching Academic Standards (LTAS) Statement for Environment and Sustainability* and available for use from early 2015.

Details of the project are available at the project website: http://environmentltas.gradschool.edu.au/.

The External Evaluator for the project is Professor Daniella Tilbury, University of Gloucestershire, UK. Professor Tilbury can be contacted at daniella_cam@hotmail.com.

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Introduction

Threshold learning outcomes (TLOs) for Environment and Sustainability are presented in draft form (page 3 onwards) for piloting by colleagues teaching at universities in Australia in the field of Environment and Sustainability. The TLOs are intended to apply to qualifications in Environment and Sustainability offered by tertiary education providers nationally. This *piloting draft*, version 0.9.1, was prepared by the Project Team and informed by stakeholders' comments received through two phases of public consultation. Comments were invited on the preceding *consultation draft*, version 0.8, which had been critically reviewed by the Project's Reference Group, comprising: Professor **Greg Hill**, (Chair), Vice-Chancellor, University of the Sunshine Coast, Dr **Aidan Davison**, University of Tasmania; Dr **Anna Hurlimann**, University of Melbourne; Dr **Dimity Podger**, Barasa Consulting Group; Professor **Pierre Horwitz**, Edith Cowan University; Associate Professor **Michele Rosano**, Curtin University; Professor **Steve Turton** (ACEDD President's Nominee), James Cook University. The Project Team reports regularly to ACEDD at ACEDD's bi-annual meetings and through contact with ACEDD's President and Executive. Project evaluation is provided by Professor **Daniella Tilbury** (University of Gloucestershire), the project's External Evaluator.

Environment and Sustainability: The scope of the field

Environment and Sustainability is a coherent field of teaching, learning and research, but not in the traditional disciplinary sense. Environment and Sustainability as a field addresses a set of concerns that are shared across many individual disciplines, spanning the full breadth of the natural and social sciences and the humanities (e.g. from environmental science, and engineering, through to human ecology and environmental management, planning, law, history and philosophy). The field has evolved in the context of growing awareness of human impacts on environments, and includes education *about* the environment and sustainability, as well as education *for* the environment and sustainability.

The Environment and Sustainability field is distinctive through a combination of three key characteristics. First, the field gives attention to relationships between human societies and the Earth system. Education in this field (i) involves learning fundamental aspects of society-nature interactions and interdependencies in relation to their present and future conditions, and (ii) supports learners to develop skills required to influence the transformation of human societies towards a more sustainable future. The field addresses interconnections between social, environmental and ecological dimensions of social justice, sustainability and resilience.

Second, the field values transdisciplinarity. Transdisciplinarity encourages a shift in perspective that includes *and* extends beyond single traditional disciplines: this approach recognises that responses to 'wicked' sustainability challenges (challenges that have conflicting definitions, causes and a difficult resolution) lie beyond individual disciplines. The field thus encompasses and synthesises the contributions of many disciplines and seeks to draw academic knowledge into dialogue with other forms of knowledge. Contemporary environment and sustainability thinking engages with complexity, uncertainty and cross-scale interdependencies, is creative, and searches for new, more integrative ways of understanding the world.

Last, the field is also characterised by its focus on futures. A relatively consistent intent of sustainability is to ensure the viability of human societies and ecological systems into the future. Decision-making for sustainability therefore makes links between our actions in the present and their impact in the future. It orientates the actions of those in the field to one of envisioning and negotiating more positive futures. The Environment and Sustainability field acknowledges uncertainty and seeks to prepare graduates with skills and attributes that are adaptable for decision-making across a broad range of possible futures.

Threshold Learning Outcomes for Environment and Sustainability

Bachelor degree

Upon completion of a bachelor degree in the field of Environment and Sustainability, or a bachelor degree with a major in Environment and Sustainability, graduates will be able to:

Domain	Threshold Learning Outcome
Transdisciplinary Knowledge	**1. Demonstrate broad and coherent knowledge of:** 1.1. environments at various scales, interdependencies between human societies and environments, and sustainability 1.2. key environmental and sustainability challenges and their drivers 1.3. complexity, including holistic systems thinking
Systemic Understanding	**2. Demonstrate understanding of diverse approaches to environment and sustainability, including:** 2.1. disciplinary and transdisciplinary approaches to identifying and conceptualising environmental and sustainability challenges 2.2. different frameworks for knowing 2.3. their own and others' values, knowledge, perspectives and interests 2.4. the particular values, knowledge, perspectives and interests of indigenous peoples
Skills for Environment and Sustainability	**3. Demonstrate well-developed cognitive, technical and communication skills through:** 3.1. addressing research questions by identifying, synthesising and applying appropriate knowledge and evidence from diverse sources 3.2. thinking critically and creatively in envisioning, designing and evaluating alternatives for sustainable futures 3.3. applying tools, methods, skills and theoretical knowledge for environment and sustainability practice 3.4. working both independently and collaboratively 3.5. communicating with diverse groups in various contexts using a range of written, oral and visual means 3.6. engaging with indigenous approaches to environmental and sustainability challenges
Ethical Practice	4. **Demonstrate ethical professional, public and personal conduct by having capacity to**: 4.1. reflect on and direct their own learning and practice in the context of environment and sustainability 4.2. participate constructively in decision-making consistent with principles of sustainable development

Learning for Sustainability

Learning for sustainability involves cognitive (knowledge and its application) learning as well as higher order affective learning (relating to values, behaviour/actions and attitudes which emotionally involves the learner). Affective learning progresses from basic skills (e.g. a willingness to listen, to read and to acquire information) to more advanced skills (e.g. self-reliance, an ability to cooperate and lead). These affective skills are especially important for unknown futures where learning is understood in terms of human qualities and dispositions.

Secondly, learning for environment and sustainability implies learning for change and transformation. Environmental education and engagement activities which develop students' capacity to think critically and their capacity to innovate and implement solutions are likely to be more effective than knowing and understanding in addressing complex sustainability challenges. This requires deep learning - that which uses independent thinking and the ability to organise and structure a wide range of information types into a coherent whole as a result of comprehending the underlying meaning.

For these reasons learning for environment and sustainability needs to be active, experiential and participatory. Active learning challenges the concept that the teacher or lecturer is the wholly authoritative source of knowledge and realigns the role of educators as facilitators and participants in the learning process. It encourages learners to question assumptions and dominant ways of thinking through their educational journeys and participate in learning and decision-making. It means that learning is interactive, experiential and learner directed thereby empowering both the cognitive and the affective skill sets that they will require to respond to a future which is likely to present novel and unknown challenges. By using active learning approaches, learners tackle authentic issues, thus modelling the decision-making processes that they are likely to undertake in their roles as professionals and citizens beyond graduation.

Active, participatory learning also encourages the sharing of multiple perspectives, the confrontation of bias and building positive relationships. This collective or social learning is reflective and allows both cognitive and affective learning to take place in informal and more formal settings. Participatory learning is best supported when it facilitates the sharing of different knowledges and understandings but also accounts for different learning styles. Learning undertaken in this way goes beyond environmental literacy or sustainability awareness and allows people to understand the systemic way in which the world works, and the fundamental changes required at all levels. It promotes active citizenship for empowered change.

Although this pedagogy is by no means constrained to learning for environment and sustainability (i.e. it is highly valuable to traditional disciplinary learning also), it is explicitly within this framework of teaching and learning that the TLOs for Environment and Sustainability are presented.

Notes to the TLOs

The TLOs are structured to be consistent with the AQF categories of knowledge, skills and application, and are designed to be interpreted in the context of the nature and extent of the field of Environment and Sustainability, as described above. These notes provide explanations of key terms used in the TLOs in order to help stakeholders understand the meaning and intent of the TLOs.

TLO 1

Broad and coherent knowledge: *Broad and coherent knowledge* in the Environment and Sustainability field implies transdisciplinary knowledge of key environment and sustainability issues and an appreciation of different frameworks for exploring those issues (see TLO 2.2).

TLO 1.1

Environments: *Environment* can be defined in varied ways across the natural and social sciences and the humanities in order to bring focus or emphasis to particular aspects of environment and sustainability.

Scales: Appreciation of relevant *scales*, including spatial, temporal, geographic and organisational scales, and the role of cross-scale interactions, is important for understanding environment and sustainability concepts, principles and issues.

Interdependencies: Relationships between human societies and environments is a central concern, as noted in 'The scope of the field'. One common example is understanding human societies as wholly dependent on natural systems. Indigenous understandings can in contrast emphasise reciprocity, as expressed in the concept of 'caring for country'.

Sustainability: Sustainability refers to the capacity of particular environments and the Earth system as a whole to support human societies. Social justice is implicit in the concept of sustainability.

TLO 1.2

Key environmental and sustainability challenges: Key content areas for programs in Environment and Sustainability include challenges such as climate change, waste, energy use, biodiversity loss and resource overuse.

TLO 1.3

Complexity: Complex systems are characterised by non-linear change, uncertainty, and the potential to evolve. Complex environmental and sustainability challenges are further characterised by contestation amongst stakeholders.

Holistic systems thinking: *Systems thinking* is about understanding complex wholes, including by understanding internal relationships amongst elements of a system, and external relationships between a system and its context. Systems thinking differs from reductionist thinking which separates out and focuses on discrete aspects of a particular issue.

TLO 2.1

Transdisciplinarity: *Transdisciplinary approaches* are suitable for complex problems (problems characterised by conflicting problem definitions, multiple causes and difficult resolutions), whose full understanding lies beyond individual disciplines. Transdisciplinary research develops new insights which synthesise a range of relevant disciplinary understandings: in this way, transdisciplinary approaches differ from single-, cross-, multi- and interdisciplinary approaches. Bounded transdisciplinarity describes inquiry limited to scholarly

disciplines, whereas unbounded transdisciplinarity may also draw on other types of knowledge including Indigenous, expert, lay and local knowledge.

TLO 2.2

Frameworks for knowing: Different ways of knowing reflect epistemological diversity across disciplines and beyond disciplines to other knowledge including Indigenous, expert, lay and local knowledge. Knowing about the varied ways in which environment and sustainability is understood, how this varied knowledge is generated and used and its limitations, is critical to transdisciplinary approaches.

TLO 2.3

Values, knowledge, perspectives and interests: Interactions between human societies and their environments are strongly influenced by *values, knowledge, perspectives and interests*, and awareness of one's own worldview, and the worldviews of others, is critical to understanding diverse concepts and approaches associated with environment and sustainability.

TLO 2.4

The particular values, knowledge, perspectives and interests of indigenous peoples: *The particular values, knowledge, perspectives and interests of indigenous peoples* are a significant area of required understanding because of Aboriginal and Torres Strait Islander peoples' connections to, and understanding of, land and environment in Australia and together with their expertise and obligation to care for country is unique. Engaging effectively requires attention to continuing unequal power relationships between Indigenous peoples and others.

TLO 3.1

Research questions: *Research questions* is used broadly to include identifying and defining problems through to resolving and responding appropriately.

Diverse sources: This can include knowledge and (qualitative and quantitative) evidence originating in diverse disciplines as well as other types of knowledge (e.g. indigenous, expert, lay and local) as appropriate.

TLO 3.2

Thinking critically and creatively: Thinking *critically* includes the ability to analyse, to integrate, and to problem solve. Thinking *creatively* is important towards developing novel solutions to current environment and sustainability challenges and to be able to respond to highly uncertain and changeable futures.

Envisioning, designing and evaluating alternatives for sustainable futures: *Envisioning is a* higher order attribute that draws on creativity to strategically explore and reflect on a range of future options. *Designing and evaluating* a*lternatives for sustainable futures* links the creative thinking to options for decision-making through the ability to investigate future consequences of a range of decisions taken in the present. These can be explored through approaches such as future visioning, scenario building and modelling.

TLO 3.3

Tools, methods, skills and theoretical knowledge: Each of these will vary according to the focus and emphases of individual programs. *Tools* may include hardware such as field and/or laboratory equipment, and software (e.g. geographic information systems software). *Methods* may include water and air sampling techniques, community engagement strategies, risk analysis, supply chain analysis, participatory decision making, community engagement, scenario planning, statistical analysis, adaptive management, Environmental Impact Assessment, cost-benefit analysis. *Skills* may include field work, monitoring,

facilitation, project management, strategic planning, information management, time management, workplace etiquette, policy analysis.

TLO 3.4
Working independently and collaboratively: Graduates are able to work both autonomously and with others, as appropriate.

TLO 3.5
Diverse groups in various contexts: Graduates need appropriate skills to communicate about complex environmental information with a wide range of *diverse groups* such as the general public, decision-makers, and Indigenous people. Graduates will be expected to be able to communicate in *various contexts*, including small work group meetings, community consultation processes, and briefings for decision-makers.

Written, oral and visual means: Ability to use appropriate *written, oral and visual* communication forms and tools for specific audiences is important when communicating complex environment and sustainability information, knowledge and ideas. Traditional written communication forms can include reports, essays, literature reviews, media releases and speeches, and digital media forms of writing including blog posts and tweets. Oral communication forms can include individual and group presentations and viva exams. Visual communication forms can include maps, plans and process diagrams.

TLO 3.6
Engaging with indigenous approaches: Graduates from Australian tertiary Environment and Sustainability programs are likely to find themselves working closely with Aboriginal, Torres Strait Islander, and other Indigenous people internationally, and will need to develop the capacity to work effectively in partnership with Indigenous people. Being able to support authentic Indigenous participation in decision-making requires graduates to have sufficient cultural awareness and knowledge of appropriate approaches.

TLO 4.1
Reflect on and direct learning and practice: Graduates will be able to *reflect on* their own learning and practice, and *direct* their own lifelong learning, including being able to know where to access appropriate information and support. This is especially important for environmental and sustainability graduates in a world characterised by growing rates of change, requiring continually evolving skills and expertise.

TLO 4.2
Principles of sustainable development: The 1992 *Rio Declaration on Environment and Development*, endorsed by United Nations member states, articulates broadly accepted and long-established principles of sustainable development including the precautionary principle, intra- and intergenerational equity, and public participation in decision-making. These principles are also reemphasised by the Australian *National Strategy for Ecologically Sustainable Development* endorsed by the Council of Australian Governments. Principles of sustainable development continue to evolve in terms of their scope and how they are enacted e.g. in 1996, the *Bellagio Principles* were designed to guide assessment of progress towards sustainable development and were endorsed by a broad, international group of stakeholders.