

Building capacity in Education for Sustainability: A model of practice

Dr Ruth L Hickey & Dr Hilary Whitehouse
School of Education
James Cook University, Cairns Campus

Abstract

Sustainability has been described as a “recalibration of human intentions to coincide with the ways the biophysical world works” (Orr, 2005, p. xiv). It is timely to determine teacher educators’ perceptions of sustainability education, and how they position their teaching to support preservice teachers to (a) develop robust knowledges, practices and values of conservation, stewardship, appreciation of ecological limits and socio-ecological interdependence and (b) understand in sufficient depth and breadth, to teach these skills and understandings to youth, who will be enacting their beliefs within tropical ecosystems. Such work builds on strategic initiatives for system-wide change (Ferreira, Ryan & Tilbury, 2006). This paper reports on the extent of centrality of sustainability education in lecturer practice, as found in a Queensland university School of Education. Using data from a research method of semi-structured, face-to-face interviews with Education lecturers, a multi-level classification model of practice was developed. Categories were developed to describe levels of engagement with education for sustainability (EfS) practice, these are: *explicit practice*, *opportunistic practice*, *cultural and social focus*, *integrated focus* and *not included*. The results identify a range of current strategies that embed, to varying degrees, awareness of sustainability into lecturers’ practice, when planning programs, courses, learning activities and assessment. This information can be used to suggest a direction for strategic change, and increase the centrality of EfS in lecturer practice.

Introduction

Education for Sustainability (EfS) is recognised as a necessary consideration for teacher education in Australia. EfS refers to “educational activities which support the development of concepts, understandings, knowledges, skills, values and attitudes which advocate a sustainable approach to human endeavour and practice” (Hickey & Whitehouse, 2010).

The impetus for adoption of EfS within preservice teachers’ programs in Australia comes from multiple directions, including international (UNESCO, 2004) and national level policies. A federal paper *The Future of Schooling in Australia* (Council for the Federation of Australia, 2007) promoted education as critical to addressing contemporary challenges as a two-fold focus of environmental and societal sustainability. *Living Sustainably: National Action Plan for Education for Sustainability* (Australian Government, 2009) endorsed sustainability in preservice teacher education as part of national education structures with an “enhanced profile for education for sustainability within Australia” to transform practice, not only provide content knowledge (p. 10).

Australian schools are supported with a wide range of curricula to meet established EfS goals though the *Australian Sustainable Schools Initiative* (Australian Government, 2010). This initiative promotes place-based and multi-modal learning approaches (Comber, Reid & Nixon, 2007). The draft *Shape of the Australian Curriculum: Science* (ACARA, 2010) includes sustainability as a “unifying idea” (p. 9) with “ecological sustainability” as part of “contemporary science” (p. 5). The Queensland Government promotes a well-informed “eco-

citizen” as part of a values framework (Queensland Government, 2010a) and has declared 2010 to be the Year of Environmental Sustainability (Queensland Government, 2010b).

Research context

Within the tertiary context however, “education is far from realizing its maximum potential of helping people understand and appreciate the environment and their role with respect to sustainable development” (Palmer & Birch, 2005, p 114). A recent report from the Australian Research in Education for Sustainability (ARIES) by Ferreira, Ryan, Davis, Cavanagh & Thomas (2009, p. 59) examined the extent to which EfS is included in teacher education in Australia, and recognised the role of “key agents of change” with systems who, irrespective of their level in the organisation, have the capacity to influence others within teacher education systems.

In Queensland, Education lecturers are charged to prepare preservice teachers to teach eight key learning areas (QSA, 2010a; QSA, 2010b). However, only two specify “sustainability” and “informed social and environmental action” (Studies of Society and Environment, Year 9) and include the impact of decisions on students’ environment (e.g., Science, Year 7, through the “preservation of wilderness environments to help protect endangered species”) as required knowledge. Lecturers must also include opportunities for preservice teachers to demonstrate achievement of professional standards (QCT, 2009), however, at this time, the concept of EfS is absent from the published standards, and the use of the term *environment* relates only to classrooms as “learning environments”.

Our research focus was to describe current practices by Education lecturing staff, at our research site of a Queensland university, and identify how lecturers embedded EfS into their practice. Our research question was: What opportunities do lecturers provide to preservice teachers to develop understandings, skills, practices, and values through EfS? Findings would be used to evaluate the extent of potential engagement for preservice teachers in EfS as part of their coursework. Data collection was supported by an *Investigating Queensland Educating for Sustainability in Teacher Education* (IQuEST) project grant (Hickey & Whitehouse, 2010).

Method

Eighteen tenured and sessional teaching staff from the research site were interviewed. They represented 90% of lecturers for over 500 preservice teachers in undergraduate programs of Bachelor of Education and Graduate Diploma in Education. The authors were included as participatory action researchers and conducted the interviews and analysis.

Interviewed staff represented four quadrants of teacher education: pedagogy (generic strategies of planning, teaching and assessment), professional experience (practical classroom work), the learner (cultural diversity and child development) and curriculum studies. This approach to curriculum (based on analysis by Summers, Childs & Corney, 2005, p. 626) provides preservice teachers with understandings of specialist disciplines, as well as multi-disciplinary planning looking at broad concepts.

Interviews were conducted individually for 30-50 minutes. The interview style was semi-structured, to allow for clarification and further reflection, in response to the supportive interest of the face-to-face interviewer. Initially, to stimulate thinking, participants were asked for their personal understanding of the terms *environment*, *environmental education*, and *education for sustainability*. Then, to determine what the lecturers recognised as providing

opportunities for preservice teachers to develop understandings, skills, practices and values through EfS, they were asked to reflect on their practice (lecture content, workshop activities, tutorial topics, course readings and assessment tasks) and comment on how this supported preservice teachers to engage in EfS. Finally, each was asked to respond to the idea of participation in professional development in EfS. Responses were transcribed, then analysed using continuous comparison method. Draft categorisations were critiqued by independent researchers, modified and re-coded for consistency.

Results

The analysis of transcripts resulted in a model of practice, comprising five categories (see Table 1) which describes how participants included opportunities for preservice teachers to engage in EfS. Most lecturers had responsibility for more than one course, and were consistent in the way they embedded EfS across diverse courses; one lecturer/tutor, with dual categories was included as “explicit practice”.

Table 1
Model of lecturer practice in embedding EfS into courses

Category	Practice	No. (%)
Explicit	Explicit teaching and assessment of preservice teachers’ understandings, skills and practices related to EfS.	3 (17%)
Opportunistic	Limited teaching towards EfS. No assessment of preservice teachers’ understandings of EfS.	2 (11%)
Integrated	Explicit teaching and assessment of cultural and social aspects of human endeavour and social/cultural environment. Explicit linkages are made to the physical/natural environment. There is deliberate placement of human culture and society within this context.	3 (17%)
Social and/or cultural	Explicit teaching and assessment of cultural and social aspects of human endeavour and social/cultural environment. No linkages made to EfS with a focus on physical/natural aspects.	1 (5%)
Not included	No teaching or assessment of EfS.	9 (50%)
Possible	School-based teacher educators may include EfS for preservice teachers during Professional Experience.	n/a
		18 (100%)

Note: No. refers to number of lecturers in that category. Percentage refers to proportion of that category as part of the cohort of 18 lecturers.

Explicit Practice

The Explicit Practice category refers to lecturers (17%, 3 of 18 participants) who described content, learning activities, reading materials and assessment tasks, all of which supported preservice teachers’ opportunity to learn and demonstrate their learning of the values, practices and beliefs of EfS, with a high profile given to ecological, and environmentally-attentive learning. While these lecturers are required to meet mandated requirements to provide preservice teachers with understandings of environmental and ecological sustainability (in the Science and SOSE learning areas) they argued from a position of

personal passion for supporting preservice teachers to achieve a sound, critical and extensive understanding of content and values of EfS.

One lecturer provides preservice teachers with environmentally-focused EfS and goes “beyond Queensland curriculum because there is insufficient content on sustainability”. She does not “push for content knowledge but for observation of nature ... and understanding the policy which supports the imperative of ecological identity because I believe the focus of environment education is the person” (Lecturer C). Lecturer F explained that she deliberately selected content with highly specific EfS as she sees sustainability education as a global imperative. In her interview she rejected divisions between social and ecological environments and “builds the SOSE inquiry process ... [using] the word *sustainable* because it is one of the four key SOSE values of peace, social justice and democratic process ... our world is not sustainable.”

Opportunistic Practice

This category describes lecturers (11% of the cohort) who took the opportunity to incorporate activities – which would develop preservice teachers’ understandings of EfS – even though this was not mandated in course descriptions. During interviews they revealed a strong interest in EfS ideology, comfort in teaching it, and argued from a position of personal commitment to support preservice teachers to achieve a critical and extensive understanding of content and values of EfS.

To achieve this they used a range of strategies such as teaching EfS through examples, contexts and learning activities, but did not formally assess preservice teachers’ understanding. For example, one pedagogy lecturer explained that during a 3-week class on curriculum planning she has preservice teachers examine the issue of dingoes in Fraser Island, as a context to examine “a social and environmental issue with no easy answer (Lecturer K). An English curriculum lecturer assessed preservice teachers’ skills in analysing discourse, through a realistic scenario linked to sustainability. He “presented them [with] a scenario where the school has got a grant to build a community garden, and they had to develop an entire integrated curriculum with all the Essential Learnings from English around developing this sustainable garden” (Lecturer H).

Integrated Focus

Lecturers (17%) in this category focused on socio-cultural aspects making a links to the physical environment, but without explicitly developing EfS knowledge and skills. We see this category as being a first step towards developing an explicit EfS practice. An HPE curriculum lecturer said, “Food relates to my area around nutrition [and] in thinking about protection of the living environment in which we grow our food, a lot of kids in schools might just see that as going to the supermarket. [When] teaching children where the food comes from, protection for the environment [is critical] to maintain the food supplies” (Lecturer P).

Social and/or cultural focus

A fourth category of practice characterised one lecturer (5% of the cohort) who developed preservice teachers’ understandings of cultural diversity, cultural identity, social justice, and indigenous perspectives, and she explicitly separated this, from her view of EfS. She made the distinction that science-based or ecological-environmental focus was not part of her teaching and deliberately excluded attentiveness to the biosphere. She acknowledged that “the environment” was not “core business” because it was not her field of expertise and she did not

have “strength of knowledge” compared to her recognised strength. She said, “ I think the expertise I bring to what I do is about social sustainability ... [which is] linked to people and culture because of Indigenous practice” (Lecturer B).

Not included

Half of all lecturers interviewed (50%) confidently excluded *environment* and *sustainability* as part of their teaching and assessment. They argued that it is difficult to bring EfS into curriculum teaching as, historically, many curriculum disciplines are well-defined in terms of a social realm which is exclusive of ecological/environmental considerations. This is the body of curriculum content that preservice teachers are expected to learn. Even when curriculum lecturers were environmentally active outside of university, they found it difficult to integrate EfS into established fields of knowledge.

One mathematics curriculum lecturer said, “Actually there wouldn’t be anything. Because the subject that I’m ... teaching is a first year subject ... bringing ... content of mathematics up to standard before we start to branch out into more critical components” (Lecturer X). Lecturer O explained: “If you are thinking about sustainability in terms of looking how we can recycle our rubbish or reduce greenhouse gases, I find that quite difficult to build into the English [curriculum] lectures.” Some lecturers used the term *natural* or *environment*, but these terms were not ecologically-referenced. Lecturers’ conceptions mirror the use of the term “environment” in the QCT (2009) Professional Standards. For example, one viewed the classroom context as a “natural environment” and his focus in a psychology course was to help preservice teachers maintain this in a productive way.

Lecturers differentiated an ecological or science-based sustainability from a psychological sustainability within the classroom. Lecturer M did not ecologically reference the term sustainability and viewed the term as meaning personal resilience as a teacher: “I think using the broader definition of *environment*, being the people and places, I think that I include sustainability in terms of the resilience training that is part of that for the student teachers, in terms of their own long term sanity in the teaching environment. I don’t look at the environment in terms of outside the four walls as much, in what I do”.

Professional Experience

This category acknowledges the influence off-campus teacher educators (supervisors) who manage the learning of preservice teachers during professional experience. During teaching practicum, preservice teachers may be directed by supervisors to create lessons that support EfS (Gooch, Rigano, Hickey & Fien, 2008). Supervisors were not included in this research, but stories from two preservice teachers illustrate the widely disparate experiences possible. One described her supervising teacher’s support for using photographs of “children scavenging in rubbish dumps” and “loss of habitat due to forest clearing” to stimulate reluctant students to write in response to graphic images. The second student reported experiencing restrictions from his supervising teacher, who requested that he not include climate change in his 4-week unit, because “she believes [climate change] is a natural process, and she would be very disappointed if I put my views across that we are influencing it.”

Potential for change

To complete the interview, lecturers were asked for their reaction to an invitation to participate in planned future professional development in EfS, with the intention to increase the centrality of EfS in their practice. Their responses were used to gauge their potential for change, and provided

valuable advice, raising issues related to receptivity and caution. These are illustrated by extracts from participants' views. Percentages indicate the frequency of these views:

Potential for enhancement: Three lecturers (17%) expressed a high level of interest in being involved in PD, to confirm their already high level of inclusion of EfS into practice.

Potential for rapid change and enhancement. Some lecturers (17%) were at a pivotal point in their considerations of EfS, and were primed for rapid change, as a result of the stimulation of thinking about EfS during the interview, and were enthusiastic about professional development. We were reminded of the importance of allowing for divergent rates of uptake of embedding EfS into practice. Lecturer D enthusiastically described that might be possible for her to embed EfS in her English Drama course by selecting a text, which challenged students to react (through music, poetry, play script, or visual media) to environmental issues.

Risk of trivialisation. Some responses (22%) suggested that sufficient gravity, and longevity, of policy change must be shared with lecturing staff, to stimulate an increase of the centrality of EfS into practice. Lecturer A spoke of the risk of trivialization, if EfS is not integrated meaningfully in ways that stimulate intellectual thought: "I've come to the conclusion that it's good to do something about the environment but I think to just throw it in there as a bunch of content [would] trivialize it and [students] would forget it – there's a lot of other [competing content]. Similarly, Lecturer L was cautious of the social force, saying "there is the argument that people are 'jumping on board' [that] environmental calamity versus [social] sustainability has become popular agenda ... there must be people who are doing [EfS] simply because it is fashionable."

Blurring the distinction between ecological and social environments. Responses from 28% of lecturers suggested that an effective strategy would be built on a synthesis, rather than a divisive approach to EfS that encompasses social, cultural, economic and ecological perspectives. For example, Lecturer E reported that she was already starting to reposition her discipline into "social environments and humans' responsibilities ... working towards a unification of human and non-human environments". A critical view must be shared by all staff to support preservice teachers to be "well positioned to examine social/environmental issues with students" through participatory democratic decision making (Hart, 2003, p. 206-7) and to recognise that environmental issues "depend on credible reliable knowledge and understanding about both the biophysical and socio-cultural world as well as the politics of human decision making, which includes emotional understanding, cultural understanding".

Recognition of overload. Any strategy to increase preservice teachers' opportunities to engage in EfS through management of lecturers' practice must recognise that staff have invested years in building a complex and robust understanding of cultural and social identity. This caution was expressed by 17%, for example, Lecturer B's caution referred to potential for lecturers to feel pressured when asked to teach in areas outside of their qualifications and expertise. Also, lecturers highlighted the situation of courses already being "full or overloaded" (Lecturer G). For a strategy to be effective, it must provide sufficient time and support for lecturers to re-adjust their conceptions, as a first step to reinventing their practice. Workshops to "help the educators incorporate SD [sustainable development] issues within their own courses" (as trialed by Lozano-García, Gándara, Perri, Manzano, et al., 2008) could facilitate this as a non-threatening process.

Conclusion

Our research has developed a multi-level model of EfS practice at this research site, which describes a range of opportunities lecturers provided to preservice teachers to develop understandings, skills, practices and values.

The majority of lecturing staff in this study did not include the ecological aspect of EfS, focusing instead on socio-cultural perspectives; however some were conscious of how they could reduce this dualism of human and non-human worlds. When EfS is mandated by curriculum which values the environment (to use the terms of UNESCO, 2004) lecturers responded with explicit ecological content, and assessable tasks to give preservice teachers the richest opportunity to engage with EfS. When lecturers valued ecological attentiveness, they become creative opportunists and find teaching niches, even though EfS may not an official course component. They fulfilled the view of UNESCO (2004) to promote interdisciplinary and holistic curriculum integration for EfS in ecological, social and cultural contexts.

Based on our model of practice, we conclude that graduating preservice teachers at this research site are exposed to few explicit, substantive, assessable opportunities to develop EfS. Most of their coursework does not include, by lecturers' choice, confidence or competence, any reference to EfS. Their university experience is focused, almost exclusively, on the human condition, divorced from its ecological context.

While there must be respect for lecturers' demonstrated sense of professional responsibility to meet students' expectations or course content, as is specified in course descriptions, we suggest that lecturers could productively build conceptual bridges between social sustainability and environmental values, between cultural identity and ecologically sustainable practices, and recognise creative, low-key opportunities to embed EfS learning activities for preservice teachers into their practice.

These efforts could strengthen the inter-disciplinary links between various curricula, and increase the overall exposure of preservice teachers to EfS, through explicit, opportunistic, and integrated teaching strategies, within a re-unification of ecological and socio-cultural worlds. This could build lecturers' capacity to help preservice teachers graduate with highly developed skills, values and practices commensurate with EfS.

References

- Australian Curriculum, Assessment and Reporting Authority (ACARA) (2009). *Shape of the Australian Curriculum: Science*. Retrieved April 12, 2010 from http://www.acara.edu.au/verve/resources/Australian_Curriculum_-_Science.pdf
- Australian Government Department of Environment, Water, Heritage and the Arts (2009). *Living Sustainably: National Action Plan for Education for Sustainability*. Retrieved February 2, 2009, from <http://www.environment.gov.au/education/publications/pubs/national-action-plan.pdf>
- Australian Government Department Environment, Water Heritage and the Arts (2010). *Australian Sustainable Schools Initiative*. Retrieved May 17, 2010, from <http://www.environment.gov.au/education/aussi/>
- Comber R., Reid, J., & Nixon, H. (2007). Environmental communications: Pedagogies of responsibility and place. In R. Comber, J. Reid & H. Nixon (2007) *Literacies of place: Teaching environmental communications*. Newtown, Australia: Primary English Teachers Association (pp. 11-23).

- Council for the Australian Federation (2007). *The future of schooling in Australia*. Retrieved May 20, 2010, from <http://education.qld.gov.au/publication/production/reports/pdfs/2007/federalist-paper.pdf>
- Ferreira, J., Ryan, L., & Tilbury, D. (2006). *Whole school approaches to sustainability: A review of models for professional development in preservice teacher education*. Canberra, Australia: Australian Government Department of the Environment and Heritage and the Australian Research Institute in Education for Sustainability (ARIES).
- Ferreira, J., Ryan, L., Davis, J., Cavanagh, M., & Thomas, J. (2009). *Mainstreaming sustainability into preservice teacher education in Australia*. North Ryde, NSW: The Australian Research Institute in Education for Sustainability, Graduate School of the Environment, Macquarie University.
- Gooch, M., Rigano, D., Hickey, R., Fien, J. (2008). How do primary pre-service teachers in a regional Australian university plan for teaching, learning and acting in environmentally responsible ways? *Environmental Education Research*, 14 (2), 175-186.
- Hart, P. (2003). *Teachers' thinking in environmental education: Consciousness and responsibility*. New York: Peter Lang Publishing.
- Hickey, R. & Whitehouse, H. (2010). *IQuEST: Investigating Queensland Educating for Sustainability in Teacher Education*. Retrieved June 22, 2010, from http://cms.jcu.edu.au/education/JCUPRD_036654
- Lozano-García, F. J., Gándara, G., Perrini, O., Manzano, M., et al. (2008). Capacity building: A course on sustainable development to educate the educators. *International Journal of Sustainability in Higher Education*, 9 (3), 257.
- Orr, D.W. (2005). Foreword. In A.R. Edwards (2005), *The sustainability revolution: Portrait of a paradigm shift* (pp. xiii-xv). Vancouver, New Society Publishers.
- Palmer, J. A., & Birch, J. C. (2005). Changing academic perspectives in environment education research and practice: Progress and promise. In E. A. Johnson & M. J. Mappin (Eds.) *Environmental Education and Advocacy*. Cambridge, UK: Cambridge University Press (pp. 114-136).
- Queensland College of Teachers (2009). *Professional standards for Queensland teachers (graduate level): A guide for use with preservice teachers*. Toowong, Qld: Author. Retrieved May 20, 2010, from http://www.qct.edu.au/standards/documents/PSQT_GradLevel_v3_Web.pdf
- Queensland Government Department of Education and Training (2010a). *Tomorrow's Citizens: Skills for success in the 21st Century*. Retrieved May 17, 2010, from http://www.learningplace.com.au/default_community.asp?orgid=126&suborgid=760
- Queensland Government Department of Education and Training (2010b). *The Year of Environmental Sustainability*. Retrieved 20 May from <http://deta.qld.gov.au/yes/>
- Queensland Studies Authority (QSA) (2010a). *Essential Learnings Years 1-9*. Retrieved May 20, 2010, from <http://www.qsa.qld.edu.au/p-9/574.html>
- Queensland Studies Authority (QSA) (2010b). *Years 11-12 subjects*. Retrieved May 20, 2010, from <http://www.qsa.qld.edu.au/10-12/575.html>
- Summers, M., Childs, A., & Corney, G. (2005). Education for sustainable development in initial teacher training: Issues for interdisciplinary collaboration. *Environmental Education Research* 11 (5), 623-647.
- UNESCO (2004). *United Nations Decade of Education for Sustainable Development 2005-2014*. Paris: Author. Retrieved May 20, 2010 from <http://www.unesco.org/en/esd/>