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Sustainability Education and Teacher Education: Finding a Natural Habitat?

John Buchanan
University of Technology, Sydney, New South Wales, Australia

Abstract Sustainability education competes for curricular space, both in schools and in teacher education. Opportunities and barriers for the inclusion of sustainability education in an Australian university primary teacher education program are examined in this article. The study focused on the roles, practices and perceptions of teacher educators in promoting sustainability education. Three focus groups were conducted with members of faculty staff from each of the K–6 Key Learning Areas to gather data, which were analysed according to three frameworks: espoused/aspirational and actual practices of staff members; barriers to and affordances for teaching sustainability education; and the nature of initiatives, in terms of teaching/learning activities, assessment tasks, and resources. Beyond the Social Sciences, and Science and Technology, we found that inclusion of sustainability education is somewhat sporadic. The article proposes some ways forward to promote and abet sustainability education in a tertiary context.

An education that will show us how to 'live as if the world mattered' (Jickling, 2009, p. 209) is vital for extending the life and livability of the planet. Both educational and government authorities share responsibility for implementing sustainable practices (ACARA, 2012; UN/Agenda 21, 2012). Various terms exist for this field of education, such as 'Education for Sustainable Development' (Summers, Childs & Corney, 2005), 'Environmental Education' and 'Education for Sustainability' (Littledyke, 2009). In line with Australia's emerging National Curriculum, the terms 'sustainability' (ACARA, 2012) or 'sustainability education' will be used here. It is noted in passing here that 'sustainability' constitutes a compromise, arguably a forced consensus, or a cover-all term. Moreover, the various terms for this field are not mere synonyms; each comes with its own contested underpinning worldview (Jickling & Wals, 2008; Scott, 2009). Jickling and Wals see this contestability as generative of, rather than frustrating to, a more sophisticated understanding of environmental concerns and responses. The following literature review defines some key terms, before discussing the contribution of education to sustainability, and the dynamics of curricular change and leadership, in both primary and tertiary contexts.

Literature Review

In a number of curricular and academic works, the term 'environment' is not specifically defined, and is taken as understood. Taylor, Littledyke, and Eames (2009)

Address for correspondence: John Buchanan, PO Box 222, Lindfield NSW 2070, Australia. Email: John.Buchanan@uts.edu.au

refer to humans' entire dependence on the environment for the sustenance of life. Hart (2003) establishes the environment as a 'legitimate societal concern' (p. 18). For the case study discussed in this article, the following working definition of environment has been adopted: 'the aggregate of all the conditions that support living things' (Department of Education and Training [DET], 2001, p. 7).

'Sustainable development' is also worthy of definition or description. It entails a just resource distribution among the world's people, and other living beings, at any one time. It also applies to the use of resources by current generations, so that the wellbeing of future generations, and biodiversity, might not be unduly diminished or compromised. The World Commission on Environment and Development defined sustainable development as that which 'meets the needs of the present without compromising the ability of future generations to meet their own needs' (1987, p. 1). Adams (2006), while describing this definition as vague, nevertheless praises it for capturing the need for development to alleviate poverty, alongside the concerns of environmental degradation. Any reference to a future generation is, by necessity, speculative, and prone to conjecture, including unrealistic idealism or self-interest. Foster (2011) exposes an alleged futility in catering for an undefined future generation whose needs and circumstances are barely knowable. His arguments are, in turn, open to criticism, however, of being a convenient call to inaction.

The role of education in supporting sustainable development is central and indispensable. UNESCO (2005, p. 11) noted 'a common consensus that education is a driving force for the change needed'. Sustainability education includes cognitive and affective abilities involving: investigation and research; lateral, analytical and creative thinking; collaboration; communication; literacy; and reflection. It also develops traits such as courage and perseverance (Cheong, 2005). Ultimately, prominence of sustainability issues will need the support of all, or at least the vast majority of, teachers and teacher educators; as Hart (2003) points out, teachers and teacher educators' thinking, values and practices matter in the provision of sustainability education. As Hart (2003, p. 17) goes on to assert: 'environment matters in the school curriculum'. The importance of sustainability education in curriculum, including tertiary curriculum, is well established in Australia as elsewhere (e.g., Jones, Selby, & Sterling, 2010; Ryan, Tilbury, Corcoran, Abe, & Nomura, 2010; Velazquez, Munguia, & Sanchez, 2005). The Melbourne Declaration (Ministerial Council on Education, Employment, Training and Youth Affairs [MCEETYA], 2008), to which all Australian states are signatories, affirms environmental sustainability as a cross-curricular focus. Sustainability is one of the cross-curriculum priorities of Australia's National Curriculum (ACARA, 2012).

Understanding of human environmental impacts is both emerging (Flannery, 2008) and contested (Davidson, 2011). Jickling (2009) points out the dangers in depending solely or principally on a well-meaning but ill-informed sentimentality in regard to environmental issues and responses. There are several barriers to be surmounted if education for sustainability is to improve in order to meet the complex challenges presented by human impact on the planet (Ryan et al., 2010; Velazquez et al., 2005). These include time pressures on teachers and teacher educators (Scott & Gough, 2007; Paige, Lloyd, & Chartres, 2008), competition among multiple priorities (Moore, 2005), siloing of subject areas (Dale & Newman, 2005; Littledyke, Taylor, & Eames, 2009), the crowded curriculum (Pearson, Honeywood, & O'Toole, 2005), under-resourcing, marginalisation, and conceptual misunderstandings on the part of stakeholders (Summers et al., 2005).

Unless we are to content ourselves that all is well in sustainability education, we need to accept that change is required. If curricular renewal is to take place, at an institutional or systemic level, leadership and direction will be needed. And if leadership

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is to be transformative in nature (Hill, Wilson, & Watson, 2004), reflective and critical leaders may be called upon to 'destabilize rather than stabilize' according to Plowman et al. (2007, p. 354), by challenging current assumptions. Yet, convergent or coercive leadership may thwart systemic change. Educational leaders are called to walk a fine line in this regard. Just as Ramsden (1992) and others speak of deep and surface learning, Hill (2005) uses the dichotomy of deep and shallow leadership, or (deep) leadership as opposed to (vapid) management. Hunting and Tilbury (2006) issue a call to 'build teams, not just champions' (p. 13).

Hargreaves and Fink (2006) assert that leadership itself must be sustainable. Drawing in part on environmental sustainability language, they refer to seven leadership principles, including distributive leadership, understanding of diversity or complexity, conservation of energies needed to complete tasks, and handing on leadership and momentum to future stakeholders. Hargreaves and Fink also refer to the debilitating nature of relatively superficial performance testing regimes, in the context of attempting to measure deeper, more complex, more subtle outcomes. Similarly, provision of support for sustainability education is both essential to its success and a mark of the importance accorded to it. Fien and Maclean (2000, p. 48) advocate an 'ecology of professional development, curriculum development and practitioner research' to assist in the maintenance of sustainability education programs. Programs for environmental sustainability must themselves be sustained and sustainable, and require sustenance. Teacher educators are called upon to demonstrate the above qualities of leadership.

Tertiary institutions present particular barriers and opportunities for sustainability education. Fullan (2001) places teacher educators first and foremost in their role as change agents locally. He subsequently paints a rather unflattering picture of the quality and effectiveness of sustainability education teacher education programs in North America, being among other things, confused and under-theorised in their aims. Similarly, with regard to sustainability education, Ferreira, Ryan, and Tilbury (2007) observe that pre-service programs tend to fall well short of their potential. The traditions of academic freedom also present both challenges and affordances for the implementation of sustainability education. According to Scott and Gough (2007, p. 112), the imposition of a policy on universities could be interpreted as a compromise to their intellectual freedom, 'a special case of a wider process in which the university curriculum is subordinated to a kind of instrumentalism which is at best simplistic, and at worst self-defeating'.

Sustainability education should be central to all of the doings of a school, not just its curriculum. Australia's Department of the Environment and Heritage (2007, p. 7) observed that:

> *environmental education for sustainability pervades all aspects of the school operations, curriculum, teaching and learning, physical surroundings and relationships with the local community … environmental education for sustainability is a core feature of the school ethos — the value structure of the school.*

Approaches to sustainability education include intra-subject delivery (usually in Geography and Science), cross-curricular delivery, and delivery via 'special events'. Hill (2005) observes that environmental concerns are seen as add-ons; he advocates the development of holistic, integrated and complex solutions to complex problems. Summers et al. (2005) advise that sustainability education, at its best, entails 'concepts, evidence, controversy and values — in an integrated, non-fragmented way' (p. 627). They add, however, that this is at odds with what is an apparent Balkanised structure (Fullan, 1993) of many school curricula. Summers et al. (2005) assert that

'while theoretical arguments for interdisciplinary implementation are strong … such approaches are problematic for both schools and teacher education' (p. 624). They raise the dilemma of a locus or 'habitat' for sustainability education, outlining its limitations if closeted in only one or two subject areas as opposed to pan-curricular infusion. Some subjects, however, are relatively artificial sites for inclusion of 'Sustainability Education'. Summers et al. concede that a cross-curricular approach to sustainability education presents 'immense challenges' (p. 642).

Various schemata have been devised in order to make sense of sustainability education characteristics and approaches. Henderson and Tilbury (2004) focused on five international programs, noting commonalities, including whole-school participation (see also Ferreira, Ryan, & Tilbury, 2006), community and other partnerships, cross-curricular integration, professional development and mechanisms for monitoring, and evaluating and reflecting on programs. Katayama and Gough (2008, pp. 418–420) outline an emerging nomenclature of sustainability education programs, including characteristics such as problem-oriented, responsibility-oriented, creativity-oriented and skills-oriented approaches. Cheong (2005) devised an educational approach she called Community Problem Solving (CPS), which is described as 'resolving or improving local [environmental] issues through a problem solving process' (p. 98). Such an approach contributes to students' real and perceived agency.

Teacher competence is also crucial to effective implementation of sustainability education. Summers et al. (2005) found that pre-service teachers had more highly developed conceptions of sustainable development than did their supervising teachers in schools. While one might expect experienced teachers to be more grounded in sustainability than their neophyte counterparts, this does offer the hope that 'new blood' entering the profession infuses greater capacity to address these issues, as well as fanning the embers of optimism with regard to pre-service programs. It is conceded, however, that beginning teachers do not come from a position of strength in terms of influencing policy and practice of their schools (e.g., Ingersoll & Strong, 2011; Pietsch & Williamson, 2010; Servage, 2008).

The placement of sustainability education in Geography and/or Science is also cause for debate. Summers et al.'s (2005) small sample of Geography schoolteachers and pre-service teachers identified more facets of sustainable development than did their counterparts in science. The Geography teachers were also more likely to identify active and participatory teaching/learning methods, and were more confident than their Science counterparts in teaching sustainable development. This lends weight to the argument that Geography is an appropriate locus for 'Sustainability Education'. Conversely, a potential lack of understanding of the processes involved on the part of geographers as opposed to scientists, is possible cause for concern.

Significant numbers of K–6 teachers are science-phobic, according to Goodrum, Hackling, and Rennie (2001), and pre-service education appears to be one area in need of renewal in this regard in Australia (Tytler, 2007) and internationally (Dillon, Osborne, Fairbrother, & Kurina, 2000). Moreover, some issues, such as the dynamics of climate change, require a more technical understanding, while others, such as avoiding littering, may be more self-evident to lay people.

Sterling (2004) points out the limitations associated with the tradition of breaking systems down into their constituent parts, at the expense of identifying connections and thinking holistically or systemically. These limitations include a failure to understand connectivity, complexity and cause and effect. A systemic approach is also one of Hunting and Tilbury's (2006) six insights, the others being: a clear, shared vision for the future; team building; critical thinking and reflection; and transcendence of stakeholder engagement and linear pathways. It appears, then, that deconstruction in the

absence of reconstruction and identification of relationships, falls short of coming to terms with a coherent, holistic understanding of sustainability.

Notwithstanding the abovementioned challenges, the mandate remains for sustainability education. Bliss (2008), for example, observes the need for 'local-global citizenship that lays the foundations for lifelong engagement in contributing to the sustainability of the Earth' (p. 304). Reynolds (2009) refers to the agency potential of sustainability education, adding that related research indicates that sustainability education 'is about empowering people to contribute to a better future through mindset changes, critical reflection and building new skills' (p. 109). As with leadership, so must learning be transformative (Mezirow & Taylor, 2009). Learning in this instance is transformative of our world as well as ourselves.

The rhetoric for sustainability education is robust. In 1990, UNESCO described the formation of sustainability-literate teachers as the priority of priorities (UNESCO-UNEP, 1990). And yet, leadership on the issue appears to strike fear into the heart of those most in a position to lead on the matter. In the United States (Falkner, 2009) and Australia (Steketee, 2011), for instance, political leaders have retreated in dramatic fashion from erstwhile rhetoric on responses to climate change. Moreover, a public clamour for governments to be 'fixing' environmental problems is not necessarily matched with individual, personal behaviour changes. For their part, schools, systems and assessment regimes tend to engender a 'culture of correct answers', and to be preoccupied with basic skills testing. All of these factors may serve as distractors from or impediments to a serious, sustained confrontation of ecological issues by the students that we educate for teaching.

Kemmis and Grootenboer (2008) distinguish discursive and material dimensions of real-world problems; that is, what people say, and what they do about such issues. This distinction formed one dimension of our investigation, as outlined in the methodology.

Methodology and Theoretical Framework

The study discussed here formed part of a broader study (Commonwealth of Australia, 2010), adopting a systems analysis approach (Ritchey, 1991), conducted in several universities in New South Wales, Australia. In another component of the project (Buchanan, 2011), all students in the third year of their course were surveyed on their views about their university as a locus of practice for sustainability education.

The project set out to map the extent and nature of sustainability education in the primary education program at a university in New South Wales. Scott (2009) laments the tendency of environmental education researchers to talk among themselves, rather than to a wider audience; it was anticipated that the iterative process of focus groups would inform and reform our practice, as each of us took away information we had shared, and contemplated enacting it in our teaching, or, in Hart's (2003, p. 98) words, to peer into the 'wonder, mystery, uncertainty, and the barely knowable' of our practice with regard to sustainability education, 'to create conditions for our own views to become more explicit and part of a dialogue leading to self-reflection, perhaps critical reflection' (p. 157). Together, we investigated relative place, status, and interrelationships based on an adaptation of Kemmis and Grootenboer's (2008) sayings and doings, above. These aspects were embedded in a broad socio-political dimension, that is, the ways in which people relate to one another and to their physical environment.

Working through this lens, the project investigated sustainability education issues such as:

- How hostile or friendly to the issue of sustainability education are the *sayings* (whether aspirational or actual) of the participants?

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- How friendly or hostile are their (reported) *doings*? Hence: (1) To what extent do the sayings and the doings cohere or coincide? (2) To what extent and in what ways do power relationships and discourses impinge upon the status and delivery of sustainability education at the university?

Some indications of the extent to which and ways in which sustainability education locates itself in current programs are discussed in the findings section.

Using an action research approach (Stringer, 1996), three focus group meetings were undertaken. In each of the focus groups, six lecturers participated, five females, one male; that is, one participant from each of the six subject areas in the primary curriculum: Science & Technology, Social Science, Creative Arts/Music, English, Mathematics, and Personal Development, Health and Physical Education. The focus groups were conducted over a 5-month period, prior to the commencement of semester, mid semester and at the end of the semester. Questions focused on approaches, affordances and barriers for sustainability education in our respective subject areas and teaching practices.

One aim of the focus groups was to offer staff members the opportunity for 'making meaning from personal experience through reflection, using stories … *narrative knowing*' (Hart, 2003, pp. 97–98, emphasis added), in other words, to share their stories, in an attempt to unearth the thinking, values and aspirations that underlie practice in context.

In an effort to supplement data from focus groups, and to elicit 'in-time' observations, participants were also invited to email one another about their experiences, frustrations and so on, in implementing sustainability education, using the 'reply all' function to the forum invitation. Unfortunately, this did not generate any specific email correspondence. An email was also sent to all Teacher Education staff, asking if and how they incorporate sustainability education in their teaching. While this did not generate any specific responses, it provided an opportunity for the researcher to discuss elements of colleagues' teaching practices in sustainability education in informal 'corridor conversations' that took place as opportunities arose. Three such conversations took place. Reference was also made where appropriate to documents such as subject outlines.

Data from the three focus groups were transcribed, coded and initially analysed for recurring themes and outlying responses (Boyatzis, 1998), and then for evident matches and mismatches between what staff espoused philosophically, and what they were reportedly doing in their subjects. Classroom observations would have provided a further source of data, but it was decided, for a number of reasons, not to proceed along this path. These reasons included real or perceived intrusiveness of observations, the risk of skewed data under conditions of observation, and the time and resources required for this. Data were also categorised in terms of their role and area of influence in our teaching in the program: curriculum/subject delivery, assessment, and teaching/learning resources; and according to their status, as an enabler or an inhibitor.

The Site

The university's Environmental Sustainability Policy (UTS, 2012) asserts, among other matters, the university's determination to demonstrate leadership in this area. The policy's aspirations tend to be rather general, including working towards a sustainable future, and developing environmentally sustainable and responsible campuses. The institution is a signatory to the Talloires Declaration (ULSF, 2012). The site is a satellite campus of a university in Sydney, Australia. It sits on the borderlands of the Gurringgai and Kameraigal nations. For a suburban location, it affords some excellent oppor-

tunities for sustainability education, with its surrounding bushland and proximity to a national park.

Findings and Discussion

Arguably, one shortcoming of the term 'sustainability' is that it is a more generic term, and less immediately recognisable to a wider audience than a term that includes a specific environmental reference. It emerged at the outset of the first focus group that sustainability education did not enjoy a common understanding among participants; this necessitated explanation and discussion in order to establish a shared understanding among the group members of its environmental context. This is perhaps symptomatic of sustainability education not being predominant in the thinking of the participants. The findings are discussed below under the broad topics of subject delivery, assessment and resources.

Subject Delivery

There emerged a range of sustainability education engagement in various subjects in our program. The highest engagement was in Social Science and Science. Inclusion elsewhere tended to be incidental, sporadic and tangential. This is consistent with findings elsewhere, such as Miles, Harrison, and Cutter-MacKenzie (2006), who describe such experiences as 'diluted' (p. 49), and Ferreira, Ryan, and Tilbury (2006), who attribute, in part, poor teacher education for a paucity of whole-school approaches to sustainability. A brief overview of current sustainability content in our course is presented in the Appendix.

One cross-curricular subject, Society, Science, Technology and the Environment, involves 'understanding the intersections of science and technology, and social and environmental education; … developing values such as a commitment to environmental sustainability' (subject outline). This subject focuses on environmental issues through, inter alia, study of the Snowy Mountains Scheme and the Murray-Darling River Basin, and an exploration of sustainability issues related to early British settlement. This is supplemented by a field trip to The Rocks, a heritage precinct in Sydney, with links to early British settlement.

Field trips to a local national park and to the bushland surrounding the campus feature in science and social science courses, along with associated pre- and post-field trip activities, guest speakers from a local Environmental Education Centre, as do mapping and 'town planning' exercises. Current events including sustainability issues feature in discussions and other forums, such as in-class parliamentary debates. In Learning in Science and Technology, students conduct research into the environmental costs, as well as the benefits (transport, sorting and the like) of recycling. An 'electricity' module in this core science subject is a catalyst for discussion of alternative energies.

Beyond this, as mentioned above, evidence of inclusion of sustainability proved to be incidental in nature. In English education, discussion on packaging and advertising refers in passing to related waste. According to the maths lecturer, 'environmental issues could be used as part of teaching about statistics, but it would be kind of forced'. Since the time of the interviews, however, a new assessment task has been devised, and is discussed under 'Assessment' below. Music as a vehicle for protest or social action does not feature strongly in the core music subject, but an elective subject, Music in Society, investigates social issues. The art teacher was unable to attend focus groups, but indicated that art as a vehicle for environmental statements regularly features in her teaching and in set assessment tasks. She recycles canvases, and to a limited

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extent, other materials 'to save costs and landfill'. The PDHPE lecturer indicated that sustainability implications of lifestyle choices, such as cycling or walking instead of driving, arise in her subject. From some of the preceding comments, it could be inferred that sustainability education is not central to these participants' thinking and planning.

A brief discussion took place during one focus group about the location of sustainability education in the Human Society and its Environment (Social Science) Key Learning Area, rather than in Science, both locally, in New South Wales, and elsewhere. This raised the question of the knowledge requisite for environmental stewardship, as opposed to a caring attitude in the absence of evidence-based understandings of how to protect the environment and why. This may lead to what one focus group member called 'well-intentioned but ill-informed tree hugging'. It might also result in an inability for school students to take part in an informed way in discussions on climate change.

The English lecturer raised the dilemma of cross-curricular as opposed to subject-based environmental sustainability, adding the caveat, 'if you're not careful, [sustainability education] is ignored', in that no one will assume responsibility for it. Her comments reprise the debate as to sustainability education as an 'add-in' or 'add-on'. Both have their advantages and drawbacks. Each adds to curricular burden, as illustrated by the following comment that it is 'one more thing you've got to do and try to fit into your [teaching and learning] time (Social Science lecturer, focus group 1). A siloed curriculum is a more minor problem in primary than in secondary contexts. We noted at the time that sustainability education also finds a place elsewhere in the program, as outlined in brief below:

- One professional experience (practicum) is based in informal learning settings. The subject's coordinator reported that significant numbers of students select locations with a sustainability focus, such as national parks and environmental education centres. The students' prime motivations remain unknown to us, and would merit research.
- Indigenous education in the program includes environmental links, including reference to Dreaming places and other connectivities to country, and patterns and practices of customary environmental stewardship.
- Several course electives incorporate sustainability education. 'Planet Earth', for example, allows students to investigate 'interrelationships between biological and physical systems, a range of environments with particular emphasis on the Australian environment and investigate global issues relating to responsible environmental management' (Subject outline, 2009).

Assessment

Arguably, the distinction between teaching/learning and assessment is an arbitrary one, and the latter could be viewed as a subset of the former. Given the propensity for assessment to shape and direct student behaviour, however, it is included separately here. A summary of such tasks is to be found in the Appendix.

Several assignments in Social Science allow students to choose an environmental theme. One of these is an in-class presentation of teaching/learning ideas for K-6 teaching. Another assignment requires students to choose an event, person or cause worthy of having a day named in their honour. The examination in this subject includes an optional question of an environmental nature, environments being one of the four strands of the State's K-6 syllabus at the time of the research. Study of the Murray/Darling Basin, as referred to above, links to an assessment task in Society, Science, Technology and the Environment.

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One assignment in Science requires students to design and build a model of a sustainable house. The lecturer explained:

> *We gave them ideas such as thinking about temperature control, recycled materials, water use, waste disposal etc., and they had to build it using all recycled materials … some of them looked at water use and others were looking at saving heat.*

One recently devised Maths assignment requires students to choose a social issue and create an associated fact sheet and questions. Issues could relate to sustainability, such as statistics in recycling or energy sources, or more obliquely, population trend statistics and their environmental implications.

As outlined in the methodology section, other staff members were invited to contribute to the discussion. In one assessment task for Philosophy of Education, students discuss a choice of 'key beliefs', one of which is 'I believe that primary schooling should prepare students for taking action to create a better, more sustainable future for our world'. The lecturer added:

> *On the whole, it's a popular topic when choosing who does which one, and students tend to agree it really makes sense, … and then most seem to forget all about that in the final assignment where they write down their own philosophy of education.*

Resources and Use of materials

The English lecturer referred to the use of big books and other narrative texts that illustrate issues of sustainability, adding that a study of text types also allows for sustainability issues to be touched on, such as 'procedures … what to do if a bushfire is approaching.'

Discussion of using 'found sounds', music produced by objects in the immediate environment, is a component of the core music subject. The subject also investigates musical instruments that mimic, or hope to inspire, sounds in nature, such as rain falling, or the sea. The lecturer added that many schools' budgetary constraints mean that chairs, tables and sticks are used to improvise as musical instruments. In PDHPE the external environment is a vital resource, including the importance of clean air and water, and this reality is made explicit in the subject.

In Social Science, in-class activities include deconstruction of a variety of visual, literary and online texts, some of which relate to sustainability. Science incorporates resources such as *Murder under the Microscope* (2012), with incidental sustainability implications. Through support from AusAID, resource materials on global education, some dealing with sustainability, are distributed to students and explored for their contribution to teaching and learning activities.

The environmental cost of the resources necessary for education emerged as a critical factor in sustainability education. The Science lecturer referred to the resource-heaviness of her subject, but added that in a school context, much use can be made of recycled materials. More broadly, the lecturer in English observed the multiplier effect of changing student behavior, within and beyond the classroom: 'There is one teacher and there might be 35 students. Perhaps it's even more important what *they* are doing with their resources, perhaps under our direction.'

Use of materials, and modelling how they are used and recycled, emerged as another issue during the focus groups. While paper assessment tasks predominate in our program, the music educator uses the reviewing toolbar (a version of Track Changes)

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to respond electronically to students' work. She suggested at one focus group meeting that younger people are increasingly more willing to read on-screen than on paper, and this was met with general agreement. Many staff members, it was noted, tend to print single-sided documents. Our hard copy preference found expression in other ways — two forum members mentioned the relative difficulty of accessing electronic materials, as opposed to hard-copy: 'It's invisible. I know it's there but sometimes I'm not sure what I'm looking for [on a bookshelf].' Two staff members increasingly use podcasts, mainly for pedagogical rather than sustainability reasons. As discussed during one of the focus groups, there remains the relative demand on the environment of paper as opposed to the manufacture, running (including battery use) and disposal of computers, particularly given that they have an increasingly short productive life.

The resource of time emerged as a major constraint for sustainability education. This includes time for teaching, as well as informing ourselves about sustainability. There was common concern about a crowded curriculum, but this may remain undefined, as there is rarely such an entity as an uncrowded curriculum. As with time, so with place and space. To extend the habitat analogy, infusion or addition of sustainability education into or onto curricula will arguably compete for habitat with other worthy issues, such as global, regional and Indigenous education, as well as literacy and numeracy concerns.

We originally set out to explore a curricular habitat for sustainability education. We also recognise that 'habitat' has broader connotations, and that an environment conducive to the inclusion of sustainability education needs also to be nurtured. While there appear to be a number of obstacles, there is also widespread goodwill from staff and the institution, through its Environmental Sustainability Policy, as mentioned previously. Despite these matters, evidence of specific related policy and practice is less immediately evident at an institutional level. Further research with key policy stakeholders might confirm or refute this, but was not part of the scope of this project. While the inclusion of sustainability education is currently rather meagre, this project has put the issues before us, and led us to explore and express options for expanding our repertoire of sustainability education content and process, as part of a 'pedagogy of the possible' (Hélot & O'Laoire, 2011).

Outcomes and Conclusions: Of Sayings and Doings

One way of describing sustainability education in our institution, and perhaps more broadly is, 'invisible unless …' When asked about sustainability, both our staff and our students are capable of articulating sustainability literate responses (Buchanan, 2011). Yet, the busyness of our work and other factors as mentioned above tend to centre our concentration elsewhere. At the outset of the project, we anticipated that change in curriculum — such as a more deliberate and specific inclusion of sustainability matters — would emerge from these three focus groups, but this appears only to have happened very minimally. Our initial hopes were arguably unrealistic, given that the focus groups only occurred during one semester, and subject content is planned well in advance. While there are no ongoing specific focus groups planned at the time of writing, these and/or informal conversations, perhaps prompted by external events, such as the development of the Australian Curriculum, with its attention to sustainability as a cross-curricular focus, may prompt further thinking and reform on our part. One specific outcome related to this project is that we have joined the ranks of teacher

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education courses offering a specific Environmental Sustainability Education subject, albeit an elective one.

We concede that some of our curricular inclusions are tenuous and incidental, perhaps. Sustainability education is by no means entirely marginalised in our program, however. We do not know of an optimal level of inclusion of sustainability education; a more strident inclusion of sustainability education might have an unintended consequence of inuring students against caring about sustainability. We also recognise that student ownership of sustainability education is another vital component in its own sustainability. This consideration has shaped the new sustainability education elective subject, with a project-related assessment option. Gooch, Rigano, Hickey, and Fien (2008) note the potential for pre-service teacher-devised units of work for developing student ownership, and sustainability-related skills, attributes and behaviours, in short, the 'action competence' (p. 175) of school students and the units' authors. Morgensen and Schnack (2010) advocate the incorporation of an action competence approach into sustainability education. We trust that our students' assignments, under our direction, will contribute to this, to the extent that we seek to modify these tasks accordingly.

Information overload and disinformation emerged as inhibitors to informed action. As conceded during the focus groups, we, like many others, are at times confounded and overwhelmed by the amount of information and opinion surrounding us. Nevertheless, we draw comfort from the critical approaches that have been instilled in us, and from the virtues of precaution in action (Summers et al., 2005). We accept, however, that this is no substitute for informed opinions.

The teacher educator assumes all three of Wesselink and Wals' roles in sustainability education: 'education practitioner, programme leader, and organisational manager' (2011, p. 69). Ironically, perhaps we have emulated the stance of many international, national and institutional leaders, hesitating to accept these mantles, particularly that of leadership. Our 'sayings' are beneficent, or at least benign; our 'doings' almost certainly fall short of leadership in enhancing and expanding sustainability education's natural habitat (see Foster, 2006). While change does not come easily, the processes undertaken here have already changed us in subtle ways, with the hope of more to come, given that knowledge or awareness are necessary, even if not sufficient, precursors to action. Ultimately, we are, in large part, our own impediments or affordances to sustainability education.

As Hart (2003, p. 98) contends, 'the best we can do to extend our portrayal of environmental education in schools is to deepen the conversation with teachers', and we have taken small steps here. We need to remind ourselves that if the cost of action is high, the cost of inaction or procrastination would appear to be absolutely beyond our means.

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Keywords: sustainability education, environmental education, reflective practice, teacher education

APPENDIX

Overview of Sustainability Education Components in Bachelor of Education (Primary) Course

Sustainability as a program organiser	Incidental inclusion	Assessment tasks	Resources, field trips/ incursions/ guest speakers	Teaching/ classroom practice
Social and Environmental Education (core): Sustainability/ Geography as one strand of the subject (simulation games; links to other KLAs; use of visual, musical, written texts)	English: Themes addressed in children's literature sustainability implications of advertising (e.g., junk mail, packaging).	Social and Environmental Education (optional): Exposition/discussion text on a local environmental issue; lesson plans on sustainability; optional exam question.	Social and Environmental Education (core): guest speaker from local Environmental Education Centre; field trips (e.g., visit a local national park). Global Education texts.	Music (core): Use of 'found sounds'. Music (elective): Environmental protest songs. Art: Recycling of canvases and some other materials.
Learning in Science and Technology: Discussion of alternative fuel sources.	PDHPE: Importance of environment (e.g., clean air, water) for health sustainability outcomes of healthy lifestyle choices – walking or cycling to school etc.	Learning in Science and Technology: Making a sustainable house model (compulsory).	Learning in Science and Technology: Field trip to on-site bushland.	

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APPENDIX. *Continued.*

Sustainability as a program organiser	Incidental inclusion	Assessment tasks	Resources, field trips/ incursions/ guest speakers	Teaching/ classroom practice
Society, Science Technology and the Environment (core): Discussion/debate on climate change; town planning and sustainability. (See assessment tasks.)	Society, Science Technology and the Environment (core): The Snowy Mountains Scheme, environment, and early British settlement.	Maths Teaching and Learning: Reporting on statistics related to a social issue (compulsory).	Choice of undertaking one Professional Experience at a sustainability-focused site.	
	Issues in Indigenous Australian Education (core): customary practices/ links to country and sustainability.	Philosophy of Education (optional): Reporting on a sustainability 'key belief'. Integrating Learning Technologies: Production of ivideos, optionally on a sustainability theme.		

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Author Biography

Associate Professor John Buchanan lectures in social and environmental education at the University of Technology, Sydney, where he also coordinates international programs in Education. His teaching and research interests include intercultural education, including studies of religion, sustainability education and English as an additional language. He was founding President of the NSW Primary HSIE (Human Society and its Environment) Teachers' Association, and is vice president and immediate past president of the NSW Institute for Educational Research.