

Rising to the Challenge: Education for Sustainability in Australia

Daniella Tilbury[†]
Macquarie University

Abstract With the UN Decade in Education for Sustainable Development (2005-2014) approaching, the question is “how well positioned is Australia to respond to the challenge of educating for sustainability?”. The purpose of this paper is to provide a brief summary of ESD¹ status, needs and innovations at the national level within Australia. ESD is relevant to all major social groups and so this paper includes developments in a number of settings including, formal education, further and higher education, industry and community contexts. This paper has been informed by the recent findings of a national review of EE’s contribution to sustainability in Australia. It incorporates the latest trends and recent national initiatives which are playing a significant role in developing frameworks in ESD nationally.

Rising to the Challenge

Since *Agenda 21*, education and capacity building have been increasingly recognised as critical to help shift societies towards sustainable development. These processes are vital to enhance people’s abilities to find solutions to *unsustainable practice*. They also help *strengthen governance* and *partnerships* which build *institutional support for change* towards sustainable development.

Education for sustainable development (ESD) has crystallised over the past tens years (Fien & Tilbury, 2002). It is being increasingly recognised through the influence of *Agenda 21* and the more recent Johannesburg Summit, as more than the dissemination of knowledge or sustainability concepts. It is now understood that sustainability is a process of adaptive management and systems thinking, requiring creativity, flexibility and critical reflection (Tilbury 2003; IUCN 2004). Through team work – stakeholder dialogue and decision making - and working across disciplines, social groups learn from each other as they consider options and the consequences of these options for the future. Critical to ESD is learning how to motivate and manage change towards sustainability within organisations or institutions (IUCN, 2004; PCE, 2004). It differs from the commonly practiced environmental education approaches in that it goes beyond addressing values and attitudes of the individual to build their capacity for instigating and managing change (Fien, 1993; Sterling, 2001; Tilbury, 1995).

Closely tied to ESD is education *about* sustainable development. The latter focuses on knowledge of sustainable development including the issues pertaining to

[†]Address for correspondence: A/Professor Daniella Tilbury, Director, Australian Research Institute in Education for Sustainability, Macquarie University, Sydney NSW, Australia NSW 2109. Email: dtilbury@gse.mq.edu.au.

human actions considered unsustainable such as non-renewable resource use, over-consumption, climate change, loss of biodiversity and other aspects that are generally categorised under the triple bottom line headings of environment, social and economic. When combined, education *about* and *for* sustainable development provide people with not just the knowledge and understanding to engage with sustainable development issues but also the skills and capacity to plan, motivate and manage change towards sustainability within an organisation, community or industry.

Helping shift environmental education practices towards education about and for sustainability presents a major challenge to nations across the globe. In Australia, there appears to be recognition that this task, although ambitious, is necessary. The purpose of this paper is to provide a brief summary of ESD status, needs and innovations at the national level within Australia. ESD is relevant to all major social groups and so this paper includes developments in a number of settings including, formal education, further and higher education, industry and community contexts. This paper has been informed by the findings of a national review of environmental education's contribution to sustainability in Australia, commissioned by the Department of Environment and Heritage (Tilbury et al., 2004b-e).

Malone, Fien, Guevara & Lang (2004) have recently argued that Australia has been slow to adopt the term "sustainable development" and terms such as "environmental education", "education for sustainability" or "education for sustainable development" are often used interchangeably. However, there is clearly a shift taking place between conservative approaches to informing people and students about the environment (commonly practised as environmental education) towards educating to think more critically and reflectively about change and how to engage in change for sustainability, which underpins ESD approaches.

The Context

There have been a number of national developments over the past four years that help contextualise ESD policy and practice in Australia.

Environmental Education for a Sustainable Future National Action Plan

Australia's *National Action Plan* in environmental education for sustainability was launched in July 2000. The purpose of the National Action Plan is to provide better coordination of activities and to support leadership across major groups and a various levels. The document interprets environmental education for sustainability very broadly and recognises needs across formal education, further and higher education, community education as well as business and industry. The Federal Minister for Environment and Heritage has sought the support of State and Territory Education Ministers to implement the National Action Plan.

National Environmental Education Council (NEEC)

The National Environmental Education Council, otherwise known as NEEC, is a non-statutory body providing expert advice to the Minister for Environment and Heritage as well as to the Department for Environment and Heritage (Federal). It was established in July 2000 to provide advice on the effectiveness and profile of the Commonwealth's environmental education and ESD activities and assists in identifying priority needs in Australia. NEEC, which meets three times a year, is composed of key stakeholders from business and industry, community education, environmental education professional associations as well as school, vocational education and university education.

National Environmental Education Network (NEEN)

The National Environmental Education Network was established in May 2001. This network brings together government managers from environment and education portfolios from across the States and Territories in Australia. These groups which have traditionally worked in isolation from each other significantly invest in environmental education as a tool for change towards sustainability. The purpose of the network is to exchange information, share resources between States, Territories and national bodies; support the development of quality government programs and materials; provide a platform for exploring the theoretical aspects of environmental education and promote the strategic development of environmental education in Australia (Malone et al., 2004).

The Australian Research Institute in Education for Sustainability (ARIES)

ARIES, located at Macquarie University, Sydney, was set-up in August 2004 to meet the Australian Government's need for research, identified in the national action plan for environmental education. ARIES is working on a range of projects aimed at better understanding and achieving organisational and stakeholder change towards sustainability. In its first six months, it has undertaken the following projects: a comprehensive review of environmental education practices and their contribution to sustainability in Australia across sectors including formal education, community education, further and higher education and industry education (Tilbury et al., 2004b-e); research into existing models of Education about and for Sustainability in MBAs across Australia (Tilbury, Crawley & Berry, 2004); research into international frameworks informing Sustainable Schools Programs (Henderson & Tilbury, 2004); and research into existing ICT tools which assist industry to make changes towards sustainability (Tilbury & Adams, 2004a).

EE and ESD Across The Sectors In Australia

Formal Education

In Australia, the formal education sector continues to be the dominant focus of environmental education thought and practice but not a great supporter of ESD. Environmental education is a non-mandatory component of schools in Australia - with the exception of NSW and as a result struggles for acceptance in mainstream formal and teacher education in Australia. It has a presence in the curriculum - as a cross-curricular theme in policy frameworks but remains marginalised in practice. Key Learning Areas such as *Science* and *Studies of Society and Environment* provide opportunities for students to learn about the environment. Opportunities for modeling or developing understanding of sustainability in schools are limited. Similarly, whole school approaches which involve staff, students and community in learning for change towards sustainability are rare.

In 2004, the Australian Federal Government commissioned a research study (Tilbury, Coleman & Garlick, 2004c) which reviewed environmental education in the formal education sector and its contribution to sustainability in Australia. The report consolidates and builds upon previous studies as well as reviews environmental education programs and emerging trends in this area. It provides a snapshot of the current context and experiences within primary and secondary education, teacher education and early childhood education.

The study found that the formal education sector in Australia, has been the most resistant to change towards sustainability. Curriculum policy and guideline documents across the States have been slow to react to this thrust in environmental education and

few have only recently begun to take on the language of sustainability². Similarly there are few environmental education programs with a sustainability focus and even fewer courses that promote learning for sustainability.

Formal education is the responsibility of each State and Territory, so it is not surprising to find that the status and place of environmental education and ESD varies across the country. NSW, Queensland and Victoria have an environmental education policy document for schools. However, NSW is the only state where environmental education for sustainability is mandatory in government schools (NSW Department of Education and Training, 2001). In Queensland, ACT and NT there are specific curriculum guidelines for environmental education – although the sustainability dimension is not very strong. In WA, SA, and Tasmania environmental education is integrated into the core curriculum documents and reflects some elements of sustainability thinking. There have been several calls for an Australian environmental education policy that represents a national agreement on the key curriculum aims and pedagogical principles for schools in the area of EE (Coad, 2003; Heck, 2003; Smith, 2004).

An audit undertaken by the Curriculum Corporation in 2003 identified the representation of environmental education in the curriculum across the States and Territories. This study, completed in 2003, mapped out environmental education in relation to each Key Learning Area (KLA): English, Mathematics, Studies of Science and Environment, Science, Health and Physical Education and the Arts. The review highlighted that the nature and extent of environmental education in the curriculum varies widely within and between the States and Territories. These are outlined in Figure 1.

During the compulsory years of schooling, and despite its recognised cross-curricular nature, environmental education is still occurring predominately in the Science and Studies of Society and Environment KLA's (Curriculum Corporation 2003). However, reference to the environment and environmental education can also be found in Health and Physical Education, Technology and Mathematics. Furthermore,

- **Studies of Science and Environment:** has an EE emphasis in all States and Territories, particularly in Western Australia, which has a strong focus on sustainability.
 - **Science:** curriculum guidelines across Australia, particularly South Australia, contain learning outcomes based around learning *about* the environment.
 - **English:** no guidelines refers explicitly to EE, however, they contain *processes* that underpin EE, such as critical reflection. One quarter of its documents provide opportunities for teachers to introduce environmental issues into learning.
 - **Mathematics:** all state and territory learning outcomes provide opportunities for students to learn *in* their environment. Documents typically refer to the environment to understand measurement (mapping, geometry) or shapes.
 - **Health and Physical Education:** across all States and Territories encourage students to consider the quality of their environment. Queensland, NSW and South Australia also encourage students to reflect on the actions of themselves and others.
 - **Technology:** outcomes in South Australia and Western Australia are strongly focused on EE concerns, such as quality of life, sustainability, environmental impacts and ethics; and
 - **Arts:** most States and Territories provide opportunities to incorporate EE into their programs. Typically the focus is on understanding, reflecting upon and interpreting their environments.
- Adapted from Curriculum Corporation (2003)

FIGURE 1: EE in the Key Learning Areas across Australia

the general nature of some learning outcomes provides teachers with opportunities to deal with environmental issues and learning for sustainability in other KLA's. These opportunities can be found in English, Technology, Health and Physical Education, and the Arts (Curriculum Corporation, 2003).

A very recent development, following the Curriculum Corporation audit, has been the consideration given to the development of a national ESD statement. The curriculum statement will provide a framework for schools to prioritise and address issues of ESD within their social contexts. It is argued that this initiative provides a concerted effort by the Australian Government portfolios of education and environment with environmental educators to work together in the policy's development and implementation (Malone et al., 2004).

Community Education

Community participation and education are an increasing focus of natural resource management research and policy (Thomsen, 2004). *Environmental Education for a Sustainable Future: National Action Plan* recognises the importance of non-formal education as a key to life-long learning and learning for sustainability. Underpinning the plan is involvement of community stakeholders through action oriented approaches. Not only does the plan recognise the array of different stakeholders, but it also acknowledges the complexity of competing interests.

The Federal Government has also established the National Heritage Trust Training program for coordinators and others involved in National Heritage Trust programs – largely targeted at communities. Consistently, the plan has also established funding opportunities for environmental education and ESD programs led by community organisations. *Local Agenda 21*, promulgated by the Federal Government (Australian Government 2004b), and the NSW Government's strategy Learning for Sustainability 2002-05 (NSW Government, 2002) are examples of additional policy instruments, which provide a framework for the design and implementation of community learning in ESD.

In Australia, community education has evolved over time to result in a diverse range of learning for sustainability programs initiated at government and non-government levels (see appendix 2). Community ESD ranges from "add-on" or "feel-good" programs which focus on information sharing, to participatory programs that focus on action and lifelong learning, aiming to build healthy, vibrant communities (Kliminski & Smith, 2003). Increasingly, ESD in the community is focusing on the ability of the community to influence, share and/or control the decision-making process (Beck & Crawley, 2002). Inherent in this ability is a community's values, skill set, motivation, and capacity to effectively and efficiently contribute to processes of change. In essence, the building of these capacities is a core objective of ESD in the community (Mckeown & Hopkins, 2003).

The range of stakeholders involved in ESD community programs in Australia, however, is diverse. Each program defines the role and purpose of community stakeholders in contributing to the successful community education process. Community ESD providers in Australia include government agencies, community organisations and NGOs, networks and associations, businesses and higher learning institutions and operate from national to local scales. Directing these organisations are different policies and strategies which outline the organisation's learning priorities and contribute to the process and outcomes of the education provided. These priorities and the limited resources available to these organisations means that there is an immensely diverse range of educational programs offered to communities.

Funding for community ESD programs can be obtained from a variety of sources in Australia. Funding grants are offered through competitive processes or as one-off gifts. Government funding in particular, generally includes assessment criteria, which are typically tied to outcomes based performance and are determined through a competitive application process. Some grant authorities such as the Environmental Trust Fund in NSW strongly encourage cross-sectoral partnerships for ESD programs. Increasingly community participants, providers and funding bodies are recognising the importance of partnerships in understanding the interconnectedness and political nature of sustainability and in achieving systemic and structural change for sustainability.

Partnership projects have been important in addressing imbalances in program content and methodology. Partnerships for community ESD programs in Australia are established in one of three ways: they stem from community concern and commitments, and aim to address local issues or from a desire to attain funding for a specific project or they are initiated by agencies external to local communities, with a view to developing and/or supporting particular functions within those communities. Partnerships have been instrumental in generating community capacity. Responsive, flexible, respectful and reflective partnerships are beginning to emerge which ensure mutually beneficial outcomes and the sharing of work and information across partner organisations and sectors.

Industry Education

In Australia, industry is under ever increasing pressure to engage with and respond to sustainability issues. However, studies show that many companies, large and small, are struggling with this new broader business agenda. This may be due to a lack of belief in the business case for sustainability and/or a lack of the knowledge, skills and values required to effect the necessary change.

Numerous state and federal government departments, non-governmental organisations (NGOs), industry associations and private consultancies are seeking to address this by providing ESD training courses, toolkits and other resources. Companies themselves are also investing in and developing ESD resources for their employees and, increasingly, their external stakeholders.

A number of companies in Australia now quantify the training they provide in their annual or sustainability reports in line with the Global Reporting Initiative's (GRI) core indicator LA9 "Average hours of training per year per employee" (Global Reporting Initiative, 2002). Others detail the number of employees that have attended certain training courses, especially those focusing on environmental management and occupational health and safety. However, few go further than this to consider the impact of such training and the contribution it makes to industry sustainability. Indeed few companies appear to carry out any sort of evaluation at all and those that do tend to rely on surveys which do not always provide the information required to truly assess learnings and effectiveness. A recent participatory action research (PAR) evaluation by Sydney water of its "ESD Awareness" program is a rare example of best practice in this area (Tilbury, Adams & Keogh, 2004b).

There is still an inadequate body of knowledge about what effective ESD looks like within the business and industry sector (Sustainable Development Education Panel, 2003). This lack of analysis is also reflected in the dearth of case studies about industry ESD. Indeed there has been little discussion at all about this topic compared to the formal education sector which, continues to be the dominant focus of much EE thought and practice.

The Australian Federal Government recently commissioned the first review of needs and opportunities in this area (Tilbury et al., 2004b). It provides a snapshot

of the current context and documents experiences in order to inform future research projects. A number of key themes are identified to assist in constructing a picture of ESD experiences in business and industry. These themes consider different outcomes industry is seeking from ESD along with different methods by which it can access this learning. The themes are inextricably linked: Informal Learning through Peer Networks; Education for Product Stewardship; Educating Stakeholders for Sustainability; Resources & Tools for Change; Beyond Compliance Education; Education relating to Environmental Performance; Formal Education and Training for Industry – Contributions from the VET Sector; and Formal Education for Business – Contributions from the University Sector.

The study found that many companies struggle to distinguish between environmental performance and the broader notion of sustainable development (Roome & Oats, 1997). Those that have made this distinction recognise that sustainable development involves profound changes in core thinking, policies and practices (Roome & Oats, 1997). Many advocates for sustainable development therefore question whether incremental change strategies go far enough, regarding them as more focused on maintaining the status quo (Dunphy, Griffiths & Benn, 2003) or unable to progress a company beyond the initial corporate sustainability stages of environmental compliance and performance.

Sustainability requires a different type of thinking – holistic, critical and futures oriented – to encourage companies to reflect on the underlying assumptions behind existing structures, systems and processes in order to find pathways forward to desired and sustainable futures. Incremental change can be effective for small day-to-day changes, but not the fundamental and long lasting shift in corporate culture required for sustainability. For this, it is argued, companies need transformational change. The compliance and performance promoted by much of the industry ESD in Australia still has a role to play in setting up the foundations of transformational change. But for transformational change to occur, companies must define where they want to be and explore alternatives for getting there. These and other complex issues relating to ESD in industry are beginning to enter the dialogue in Australia. ESD is growing area of interest in the industry sector.

The concept of Sustainability Focused Organisational Learning (SFOL) has emerged in recent research as a term to describe the experiences of companies that are attempting to pursue sustainability while making substantial changes to their organisational cultures. There is a growing body of evidence to suggest that those organisations that adopt sustainability are accelerating this change by using organisational learning. In the end sustainability cannot be achieved without innovation, and innovation is best achieved in a culture that embraces learning (Senge, 1990).

The challenge for ESD if it is to fully contribute to business and industry sustainability is to foster this organisational learning as well as providing opportunities for executives and the wider workforce to develop necessary knowledge and skills.

Key ESD Initiatives and Projects

There are a number of initiatives which are leading the way with regards to ESD in Australia. A brief summary of these is provided below.

The NSW Council on Environmental Education

ESD has also been gaining attention at the State level. In 2002, the NSW Council on Environmental Education released *Learning for Sustainability*. This three-year plan provides a coherent framework for planning, financing, implementing and evaluating ESD across all sectors throughout the state. It provides a strategic focus for work

in this area and requires state and local government to work together and take a leadership role within the community.

Innovation in Higher Education

Higher Education is increasingly becoming the focus of EE and ESD activities in Australia although most initiatives focus on greening the campus. Two notable exceptions are: UNESCO's "*Teaching and Learning for a Sustainable Future*" CD-ROM, produced by Griffith University and Macquarie University's *Action Research for Sustainable Development* (ACTS) project.

The *Teaching and Learning for a Sustainable Future* project is targeted at teacher education. It developed an interactive CDROM program which contains 25 modules composed of highly interactive activities. The modules are designed to: enhance teachers' understanding of sustainable development; promote practical skills for integrating sustainable development themes into the curriculum, and use the teaching methods best suited to the knowledge, values and citizenship objectives of teaching for a sustainable future (Malone et al., 2004).

The program emphasises a holistic, interdisciplinary approach to developing the knowledge and skills needed for a sustainable future as well as changes in values, behaviour, and lifestyles. *Teaching and Learning for a Sustainable Future* aims to provide resources for learning experiences that empower students to develop and evaluate alternative visions of a sustainable future and to work creatively with others to help bring their visions into effect (Malone et al., 2004).

Action Research for Change Towards Sustainability: Change in Curriculum and Graduate Skills towards Sustainability (ACTS) is a pilot project managed by Macquarie University, Sydney and funded jointly by the Federal Government and Macquarie University. The project focuses on:

- Professional development of teachers of postgraduate units in sustainability education;
- Cross-faculty involvement;
- Using Action Research to enhance professional development for sustainability; and
- Developing graduate skills to meet the need of industry and business in moving towards sustainability.

ACTS recognises that if graduates do not have a core understanding or vision for sustainability the pathway towards a sustainable future will remain unclear. Achieving this will require innovation and organisational change – not just the integration of sustainability concepts within the curriculum. This two year project attempts to address this need by exploring ways of changing curriculum and graduate skills towards sustainability. The project adopts an innovative approach combining methodologies to explore sustainability across disciplines in higher education. The main component of the project is on action research for change within universities. The ultimate goal is to facilitate change within universities to enhance opportunities for the development of graduate skills to assist business and industry in moving towards sustainability. As the project is still in progress the specific change outcomes cannot yet be described. However, the level and nature of interest generated by the project shows there is a recognised need for work in this area. More specifically the lack of resources, opportunities and support for professional and curriculum development in ESD were highlighted.

Sustainable Schools

Perhaps the most significant initiative which has emerged in Australia over recent years is the Sustainable Schools Program. The Sustainable Schools Program is in early stages of development in Australia, with NSW and Victoria implementing and beginning to evaluate the first Pilot programs in 2002/2003. These pilot programs have run their first cycle and are currently being evaluated, with results expected by September 2004. During this time interest in the program by the other States and Territories has grown substantially and now Western Australia, South Australia and Queensland are involved in developing the initiative. All Australian States and Territories have also agreed to participate in the development of a national program facilitated through the Australian National Environmental Education Network (NEEN) (Department of Environment and Heritage 2004).

The defining feature of Sustainable Schools is the integration of existing and fragmented approaches to environmental education and ESD into a holistic program with measurable, environmental, financial and curriculum outcomes (Woods, 2004). The program helps staff and students implement efficiencies in a school's resource consumption (including energy, waste, water) and impact on biodiversity in a way which is closely aligned to the formal curriculum. The program also opens the school doors to the community by encouraging partnerships with the local community and private sector. It is a program which has been successful in engaging schools actively in change and in helping staff develop competencies in ESD.

ESD "In Progress"

ESD in Australia is "in progress". Despite these major developments and exemplary programs much capacity building work is yet to be done in the area of ESD. To assure resources are effectively and strategically invested the Federal Government under the Department for Environment and Heritage have recently announced that they will invest \$1.8 million dollars in funding ESD research. The funding will go to setting up a new institute (the Australian Research Institute in Education for Sustainability, ARIES), and to funding innovative policy and practice-oriented research projects.

Several research projects across the sectors are planned as well as Research Dialogues involving key informants from the VET and Industry sectors to assist in identifying research priorities. This research is to inform policy and practice as well government decision-making in ESD. It places Australia in a strong position to assist major groups across society to make the shift towards sustainable development. It is evidence that Australia has risen to the challenge.

Acknowledgements

This paper was presented at the International Symposium on EE and ESD in the Asia-Pacific region, Japan held on the 12th-14th August 2004. The seminar was hosted by ACCU, the Asia-Pacific EE/ESD Transaction Executive and Institute for Global Environmental Strategies (IGES).

The author would like to thank Victoria Coleman, Kate Macmaster, Amanda Keogh and Kathy Adams for their contributions to this paper which is based on a national review of EE and its contribution to sustainability in Australia.

Keywords: Education for Sustainable Development; Environmental Education; UN Decade; Australia.

References

- Beck, A., & Crawley, C. (2002). Education, ownership and solutions: The role of community involvement in achieving grass roots sustainability. Sustaining our Communities Conference, Adelaide 3–6 March 2002, Conference Proceedings. Retrieved 18 June 2004, from <http://www.regional.org.au/au/soc/2002/5/beck.htm>.
- Coad, S. (2003). Sustainability education: A curriculum imperative EQ Australia. *Curriculum Corporation*, 1, 35–37.
- Curriculum Corporation (2003). *Environmental education review – Formal education sector (schools)*. (Report prepared for The Department of Environment and Heritage). Retrieved 11 March, 2004, from <http://www.deh.gov.au/education/nap/council/summary-1.html>.
- Fien, J. (1993). *Education for the environment: Critical curriculum theorising and environmental education*. Geelong: Deakin University Press.
- Fien, J., & Tilbury, D. (2002). The Global Challenge of Sustainability. In D. Tilbury, R. Stevenson, J. Fien & D. Schreuder (Eds.), *Education and sustainability: Responding to the global challenge*. Cambridge: IUCN.
- Global Reporting Initiative (2002). *Sustainability reporting guidelines*. Retrieved 30 May, 2004, from <http://www.globalreporting.org/guidelines/2002.asp>.
- Henderson, K., & Tilbury, D. (2004). Whole-school approaches to sustainability: An international review of sustainable schools programs. Report prepared by ARIES, Macquarie University for the Department of Environment and Heritage, Australian Government.
- Heck, D. (2003) The state of environmental education in the Australian School curriculum. *Australian Journal of Environmental Education*, 19, 115–124.
- IUCN (2004). *Education for sustainable development*. Retrieved 3 September, 2004, from <http://www.iucn.org/themes/cec/education/whatis.htm>
- Kliminski, G., & Smith, E. C. (2003). Community Education and Social Capital. *Community Education Journal*, XXVII(3–4).
- Malone, K., Fien, J., Guevara, J., & Lang, J. (2004). *Education for sustainable development*. UNESCO-NIER Regional Seminar on Policy Research and Capacity Building for Education Innovation for Sustainable Development, 27th July–3rd August 2004, Tokyo Japan.
- McKeown, R., & Hopkins, C. (2003). EE does not equal ESD: Defusing the worry. *Environmental Education Research*, 9(1), 118–128.
- NSW Department of Education and Training (2001). Environmental education policy for schools, Sydney: Department of Education and Training Curriculum Support Directorate.
- NSW Government (2002). *Learning for Sustainability: NSW EE Plan 2002–2005*. Sydney: NSW Council for Environmental Education.
- Parliamentary Commissioner for the Environment (PCE), New Zealand. (2004). See Change: Learning and education for sustainability. Wellington: PCE.
- Roome, N., & Oates, A. (1997). Corporate greening in education for sustainability. In S. Sterling & J. Huckle (Eds.), *Education for sustainability* (pp. 45–56). London: Earthscan.
- Senge, P. (1990). *The fifth discipline: The art and practice of the learning organisation*. New York: Doubleday.
- Smith, S. (2004). *The state of environmental education and education for sustainability in NSW schools: Their role in curriculum development in NSW*. Submission on behalf of the NSW Council for Environmental Education to the Board of Studies, NSW, Feb 2004.

- Sterling, S. (2001). *Sustainable education: Re-visioning learning and change*. Devon, UK: Green Books.
- Sustainable Development Education Panel (2003). *Learning to last: The Government's sustainable education strategy for England*. London: Draft Presented to Ministers February 2003.
- Thomsen, D. (n.d.). *Community-based research: An opportunity for collaboration and social change Summary of study and guidelines for citizen/expert collaboration*. Retrieved 1 March, 2004, from http://www.coastal.crc.org.au/citizen_science/publications.html.
- Tilbury, D. (1995). Environmental education for sustainability: Defining the new focus of environmental education. *Environmental Education Research*, 1(2), 195–212.
- Tilbury, D. (2002). *Emerging Issues in Education for Sustainable Development*. Paper presented at the World Summit for Sustainable Development, Johannesburg (unpublished)
- Tilbury, D. (2003). The summit, sustainable development and environmental education. *Australian Journal of Environmental Education*, 19, 109–113.
- Tilbury, D. (2004). Environmental education for sustainability: A force for change in higher education In P. Blaze Corcoran & A. Wals (Eds.), *Higher education and the challenge of sustainability* (97–112). The Netherlands: Kluwer Academic Publishers.
- Tilbury, D., & Turner, K. (1997). Environmental education for sustainability in Europe: Philosophy into practice. *Environmental Education and Information*, 16(2), 123–140.
- Tilbury, D., Crawley, C., & Berry, F. (2004). Education about and for Sustainability in Australian Business Schools. Report prepared by the Australian Research Institute in Education for Sustainability (ARIES) for the Department of the Environment and Heritage, Australian Government. Sydney: ARIES.
- Tilbury, D., & Adams, K. (2004a). *Industry Toolkit Research: Background research and recommendations* Report prepared by the Australian Research Institute in Education for Sustainability (ARIES) for the Department of the Environment and Heritage, Australian Government. Sydney: ARIES.
- Tilbury, D., Adams, K., & Keogh, A. (2004b). *Environmental education and its contribution to sustainability in Australia: Industry education*. Report prepared by the Australian Research Institute in Education for Sustainability (ARIES) for the Department of the Environment and Heritage, Australian Government. Sydney: ARIES.
- Tilbury, D., Coleman, V., & Garlick, D. (2004c). *Environmental education and its contribution to sustainability in Australia: Formal Education*. Report prepared by the Australian Research Institute in Education for Sustainability (ARIES) for the Department of the Environment and Heritage, Australian Government. Sydney: ARIES.
- Tilbury, D., Coleman V., Jones, A., & McMaster, K. (2004d). *Environmental education and its contribution to sustainability in Australia: Community education*. Report prepared by the Australian Research Institute in Education for Sustainability (ARIES) for the Department of the Environment and Heritage, Australian Government. Sydney: ARIES.
- Tilbury, D., Keogh, A., Leighton, A., & Kent, J. (2004e). *Environmental education and its contribution to sustainability in Australia: Further and higher education*. Report prepared by the Australian Research Institute in Education for Sustainability (ARIES) for the Department of the Environment and Heritage, Australian Government. Sydney: ARIES.

Woods, P. (2004). Environmental Education for a Sustainable Future: Formal Schooling. *Curriculum Leadership* http://cms.curriculum.edu.au/leader/newcms/leader_view_issue.asp, 2(21), 1–3.

Endnotes

1. In Australia the term Education for Sustainability (EfS) is more commonly used than Education for Sustainable Development (ESD). In this paper the terms are used interchangeably.
2. The NSW EE Policy for Schools (2001) encourage EE approaches that develop a better quality of life for present and future generations, based on the principles of ESD, that is, requiring a balance between the environmental, social and economic impacts of development. Essential Learnings in SA, Tasmania and NT use the terms futures thinking and interdependence commonly associated with sustainability.