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A National Review of Environmental Education and its Contribution to Sustainability in Australia

Business & Industry Education

4

MACQUARIE
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This report is Volume 4 in a five part series that reviews Environmental Education and its contribution to sustainability in Australia. The research which underpins it was undertaken between July and September 2004 by the Australian Research Institute in Education for Sustainability (ARIES) for the Australian Government Department of the Environment and Heritage. The series is titled '*A National Review of Environmental Education and its Contribution to Sustainability in Australia*' and covers the following areas:

Volume 1: *Frameworks for Sustainability*
Volume 2: *School Education*
Volume 3: *Community Education*
Volume 4: *Business and Industry Education*
Volume 5: *Further and Higher Education*

This volume is the first national review undertaken in Australia and one of few attempts to capture needs and opportunities in this area. It provides a snapshot of the current context and identifies a number of key themes which assist with constructing a picture of Environmental Education experiences in business and industry. These themes consider different outcomes that industry is seeking from Environmental Education along with different methods by which it can access this learning. The document provides analysis as well as recommendations to improve sustainability practice through Environmental Education.

Acknowledgements

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Abbreviations

ACCA	Australian Corporate Citizenship Alliance
ACF	Australian Conservation Foundation
ACTU	Australian Council of Trade Unions
ARIES	Australian Research Institute in Education for Sustainability
ANTA	Australian National Training Authority
AQF	Australian Qualifications Framework
BCC	Brisbane City Council
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CSR	Corporate Social Responsibility
DEC	NSW Department of the Environment and Conservation
DEFRA	UK Department for Environment, Food & Rural Affairs
DEH	Australian Government Department of the Environment and Heritage
DET	NSW Department of Education and Training
DJSI	Dow Jones Sustainability Index
EE	Environmental Education
EMS	Environmental Management System
EPA	NSW Environmental Protection Agency
ESD	Ecologically Sustainable Development
FACS	Australian Government Department of Family and Community Services
GM	General Motors
GMU	General Motors University
GRI	Global Reporting Initiative
HP	Hewlett-Packard
HR	Human Resources
ISO	International Standardization Organization
IT	Information Technology
LCA	Life Cycle Analysis
MBA	Master of Business Administration
NGO	Non-Governmental Organisation
NZBCSD	New Zealand Business Council for Sustainable Development
OHS	Occupational Health & Safety
PAR	Participatory Action Research
RMIT	Royal Melbourne Institute of Technology
SAM	Sustainable Asset Management
SME	Small-to-Medium Sized Enterprise
SRI	Socially Responsible Investment
SFOL	Sustainability Focused Organisational Learning
TAFE	Technical and Further Education
TBL	Triple Bottom Line
TEC	Total Environment Centre
UNEP	United Nations Environment Programme
UTS	University of Technology Sydney
VET	Vocational Education and Training
WBCSD	World Business Council for Sustainable Development
WSSD	World Summit on Sustainable Development

A National Review of Environmental Education and its Contribution
to Sustainability in Australia: Business and Industry Education

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4.1 Overview of Business and Industry Education

In Australia, industry is under ever increasing pressure to engage with and respond to sustainability issues[1]. However studies[2] 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 Environmental Education (EE)[3] training courses, toolkits and other resources. Companies themselves are also investing in and developing EE 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*'[6]. Others detail the number of employees that have attended certain training courses, especially those focusing on environmental management and occupational health and safety (see Box 4.1). 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 an example of best practice in this area[7].

This lack of analysis is also reflected in the dearth of case studies about learning for sustainability approaches to Environmental Education within industry[8]. Indeed there has been little discussion at all about this topic compared to the formal education sector which, as the '*National Review of Environmental Education and its Contribution to Sustainability in Australia: School Education*'[9] illustrates, continues to be the dominant focus of much EE thought and practice.

However EE has been gaining ground over the past two years as an agenda within business and industry, as many recognise that industry engagement is critical if Australia is to progress towards a sustainable future. Recent examples include the NSW Council on Environmental Education's 2004 '*Effective Sustainability Education Conference*'[10] which showcased a number of presentations addressing industry needs regarding learning for sustainability and the Environmental Education Summit '*Building Capacity for a Sustainable Future*' which was attended by industry leaders and university decision-makers[11].

A number of professional bodies, such as the Business Council of Australia[13], have released sustainability strategies,

■ **Box 4.2**
   **ACTU approach to Education for
   Sustainable Development**

'Education for sustainable development
enables people to build the knowledge, values
and skills to take part in decisions about the
way we act, locally and globally, to improve
the quality of life now, without damaging
the planet for the future. Integrating
sustainability issues into union education and
training will ensure unions and members act
sustainably now and into the future.'

Australian Council for Trade Unions (2003, p.1)

■ **Box 4.3**
   **World Business Council for
   Sustainable Development**[12]

The WBCSD is a coalition of 170
international companies united by a shared
commitment to sustainability. The WBCSD's
activities reflect its belief that the pursuit of
sustainability is good for business and business
is good for sustainability. It's mission is to
provide business leadership as a catalyst for
change toward sustainability, and to promote
the role of eco-efficiency, innovation and
corporate social responsibility. The WBCSD's
education and training program aims to
develop skills and understanding in order
to integrate sustainability across business
operations, sectors, countries and issues.

■ **Box 4.4**
   **Cleaner Production through
   Industry Partnerships**

'Helping industry improve the environment
through the Cleaner Production Industry
Partnerships Program: Funding of $5m
over three years with matching industry
contributions will encourage industry to improve
its environmental and financial performance
through cleaner production approaches.'

NSW Government (2002, p.1)

although few specifically consider
learning for sustainability approaches.
The Australian Council of Trade
Unions (ACTU) is an exception. In
'*A Fair Australia: Environment and
Sustainable Development Policy*' the
ACTU recognises that apart from
informing community debate and
policy, trade unions play an important
role in educating and activating
workers and employers (see Box 4.2).

Some would argue that their role
is vital given their widespread
membership and extensive experience
in addressing industrial change[14].

This interest in EE and sustainability
may be in response to international
initiatives from organisations such
as the World Business Council for
Sustainable Development (WBCSD)
(see Box 4.3) and events such as
the World Summit on Sustainable
Development (WSSD) which give
prominence to business issues over
national or state policy in addressing
sustainability.

Policy Frameworks
The Australian Government's National
Action Plan '*EE for a Sustainable
Future*'[15] makes Australia one of
relatively few countries internationally
to have a national policy for EE.
It is the first Australian EE policy
document to acknowledge the need for
learning for sustainability approaches
to Environmental Education within
industry, recognising the critical role
this sector plays in efforts towards
sustainability. However, it makes
little mention of specific industry
needs beyond tertiary and vocational
education and training (VET). Instead,
given the complexity of the issues
involved and the lack of historical
precedent, the Plan frames industry
education as a longer-term goal.

State strategies, such as '*Hope for
the Future*' the Western Australia
Sustainability Strategy[16] and '*Learning for
Sustainability*' the NSW Government's
EE Action Plan for 2002-2005[17] focus
mainly on the role of formal education
and training in promoting sustainability
within business and industry. They give
little consideration to other sources,
such as company-developed programs or
informal learning opportunities such as
those documented in this study. However
'*Learning for Sustainability*' does highlight
industry partnerships and education
for cleaner production as one of its six
priority action areas (see Box 4.4).

In the UK in particular, industry needs
are a key focus of sustainability education
strategies. For example, '*Learning to
Last*' the Government's Sustainable
Development Education Strategy for
England, has a dedicated section on
'*Workforce Development*' (see Box 4.5).

In addition the UK Department for
Environment, Food and Rural Affairs
(DEFRA) has recently released a series of
Learning Guides for Professional Bodies,
Sector Skills Councils and Trade Unions
entitled '*Sustainable Development through
Education*'[19] (see Box 4.6).

Education *for* Sustainability
A number of the above strategies
talk about education or learning for
sustainability and differentiate between
this and EE.

In practice, Environmental Education
approaches tend to disseminate
knowledge *about* sustainability. Yet
increased awareness and understanding
about sustainability issues are only part
of the solution, as they in themselves do
not necessarily lead to change. Australian
companies are currently inundated
with information about sustainability,
but progress towards more sustainable
practice remains slow.

Increasingly sustainability leaders are arguing that sustainability also requires a different type of thinking – holistic, critical and futures oriented – to encourage reflection on the underlying assumptions behind existing structures, systems and processes in order to find pathways forward to desired and sustainable futures[20]. This builds capacity and empowers people to take action, which in turn leads to change.

Therefore the best educational programs combine Environmental Education *about* sustainability with learning *for* sustainability approaches to Environmental Education. This approach provides people with not just the knowledge and understanding to engage with sustainability issues, but also the skills and capacity to plan, motivate and manage change towards sustainability within an organisation or industry[21].

Stages to Sustainability

Companies often struggle to distinguish between environmental performance and the broader notion of sustainability[22]. Those that have made this distinction recognise that sustainability involves profound changes in core thinking, policies and practices[23]. Many advocates for sustainability therefore question whether incremental change strategies go far enough, regarding them as more focused on maintaining the status quo[24] or unable to progress a company beyond the initial corporate sustainability stages of environmental compliance and performance.

They claim 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, they argue, companies need transformational change (see Box 4.8).

The compliance and performance promoted by much of the industry

EE in Australia still has an important role to play in assisting changes to sustainability, but will not necessarily lead to deeper lasting change. For such change to occur, companies must define where they want to be and explore alternatives for getting there[25].

This process of envisioning and futures thinking is critical for companies to align themselves with change towards sustainability[26] and helps frame sustainability as an opportunity rather than a risk that needs to be minimised[27] (see Box 4.9).

The majority of the EE opportunities available to Australian business and industry differ from this approach, providing a one-way dissemination of information from 'experts' to companies instructing them exactly where they should go and how they should get there[28].

The concept of Sustainability Focused Organisational Learning (SFOL) has emerged in recent research[29], 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[30] (see Box 4.10). In the end sustainability cannot be achieved without innovation, and innovation is best achieved in a culture that embraces learning[31].

The challenge for EE 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 the necessary knowledge and skills (see Boxes 4.11 and 4.12).

■ **Box 4.5**
'Learning to Last'[18]

'*Learning to Last*' looks at the role of employers, trade unions, professional bodies, government, higher education institutions, e-learning providers and business schools in promoting learning for sustainability. It also notes the need for a common sustainability language, greater promotion of the business case for sustainability and firmer connections between sustainability and funding in order for learning for sustainability to be fully embraced.

■ **Box 4.6**
Sustainable Development through Education

'To reach everyone, education for sustainable development must be relevant, suit its audience and be delivered in language everyone can understand and act upon… Providing information and advice about how to act more sustainably is relatively easy. More difficult is making sure that it is understood and acted upon. Motivation is the key – wanting to learn. Interest needs to be gained and built on, until each learner is fully engaged... Engagement delivers changed attitudes, fresh ideas, different patterns of behaviour. The greater the engagement, the more instinctive the learning, leading to action and the development of best practice. As education and action proceed hand-in-hand, measuring your progress and evaluating how successful you are will be essential.'

Sustainable Development Education Panel (UK) (2002, p.10)

■ **Box 4.7**
More than the Skills Agenda

'Learning for sustainability is far more than the skills agenda.'

Holland (2002, p.5)

■ **Box 4.8**
Successful Transformational Change

Implementing transformational change strategies involves radically changing the mindsets, cultures, structures and products of organisations to obtain sustainability outcomes.

'Ten steps to creating a successful transformational change program:

1. Know where you are now.

2. Develop the vision – the dream organisation.

3. Identify the gap.

4. Assess the readiness for change.

5. Set the scene for action.

6. Secure basic compliance first.

7. Move beyond compliance.

8. Establish the performance criteria for 'compliance plus'.

9. Launch and manage the transformational change program.

10. Maintain the rage'.

Dunphy et al (2003, p.261)

■ **Box 4.9**
Futures Thinking

'The Fundamental premise of futures thinking is that the future is not somewhere we are going, but something we are creating. There is a range of possible futures, depending on our choices.'

Lowe (2000, p.3)

■ **Box 4.10**
Learning Organisations

'Learning organisations are those that have in place systems, mechanisms and processes, that are used to continually enhance their capabilities and those who work with [them] or for [them], to achieve sustainable objectives - for themselves and the communities in which they participate. The important points to note about this definition are that learning organisations:

● Are adaptive to their external environment.

● Continually enhance their capability to change.

● Develop collective as well as individual learning.

● Use the results of learning to achieve better results'.

David Skyrme Associates (2004, p.1)

■ **Box 4.11**
Organisational Success and Survival

'[Education for Sustainability] can help bring about changes in your own organisation to make it sustainable. That may sound challenging. But that is what every organisation has to face. Increasingly this is what will determine an organisation's success and survival. If you implement sustainable development education in your organisation you are in a better position to advise and help others.'

Department for Environment, Food and Rural Affairs (UK) (2002, p.5)

■ **Box 4.12**
Organisations Working Together

'Everywhere, boards of companies, executives of professional bodies, trade unions and educational institutions, trustees of charities and directors of public amenities are working together to commit to sustainable development and develop their organisation's ability to deliver it.'

Department for Environment, Food and Rural Affairs (UK) (2002, p.5)

4.2 The EE Experience in Business and Industry Education: From Principles to Practice

There is still an inadequate body of knowledge about what effective EE and learning *for* sustainability looks like within the business and industry sector[32]. This is the first national review undertaken in Australia and one of few attempts around the world to capture needs and opportunities in this area. It provides a snapshot of the current context and documents experiences in order to inform this sector.

A number of key themes are identified to assist in constructing a picture of EE experiences in business and industry education and their contribution to sustainability. These themes consider the different outcomes industry is seeking from EE and learning *for* sustainability along with different methods by which it can access this learning. The themes are inextricably linked and need to be read in conjunction[256]:

i)   Informal Learning through Peer Networks

ii)   Education for Product Stewardship

iii)   Educating Stakeholders for Sustainability

iv)   Resources and Tools for Change

v)   Beyond Compliance Education

vi)   Education Relating to Environmental Performance

vii)   Formal Education and Training for Industry – Contributions from the VET Sector

viii) Formal Education for Business – Contributions from the University Sector

i) Informal Learning through Peer Networks

■ **Box 4.13**
   Ovagreen[38]

Arup is a global engineering consultancy with offices throughout Australia. In 2000 a group of Arup staff in Sydney believed they could make a difference to the environment and formed a group called Ovagreen (named after the founder of the company, Sir Ove Arup). Their achievements inspired other offices and the Ovagreen network is now represented in over 100 Arup offices worldwide. Initiatives implemented by Ovagreen in the Sydney office include:

● Green transport survey and plan, addressing both travel between home and work and travel for work.

● Waste minimisation and recycling programs, including educational campaigns aimed at colleagues.

● Assessment of energy use and lighting, in conjunction with ideas to reduce energy consumption.

● Assessment of purchasing decisions, focusing on both environmentally and socially responsible products.

■ **Box 4.14**
   BCC Internal Sustainability Network[41]

Brisbane City Council (BCC) has a Sustainability Working Group which meets regularly and coordinates an internal series of sustainability seminars by guest speakers who are invited to talk to Council staff about sustainability issues.

It is thought that only 20% of what we learn related to work comes from formal structured training[33]. Informal interaction with peers is seen as the predominant way that many employees learn[34]. These interactions range from chance meetings by the water cooler[35] to official conferences and networking events. However many organisations are oblivious to this 'invisible' everyday learning and fail to invest either time or money in it[36]. This is not to suggest that industry should abandon formal learning, but to highlight the complementary role of informal learning, especially for people who cannot commit to higher education. Indeed, attributes of formality and informality are present in many learning situations and the two are not often easily separated[37].

Sustainability requires companies to participate in collaborative action that links traditional business issues to a set of environmental and social concerns[39]. The cross-functional nature of sustainability requires the involvement of a broad range of employees. These employees may form an internal network for progressing sustainability which can be instigated by management or by the employees themselves (see Box 4.13).

However sustainability also requires companies to acquire knowledge that is not ordinarily found in their existing repertoire or experience[40]. They may invite consultants or other 'experts' into their organisations (see Box 4.14) or participate in external networks to acquire this knowledge.

External Networks

External networks are a key source of informal peer-to-peer learning and as such represent far more to companies than just an avenue for communicating corporate information or identifying new sales opportunities. There are a number of sustainability networks in Australia which are organised by government, industry or NGOs and often in partnership with each other (see Box 4.15).

Professional and industry associations such as Engineers Australia[42] (formerly the Institution of Engineers Australia), the Property Council of Australia[43] and the Institute of Chartered Accountants in Australia[44] all regularly provide networking and information sharing opportunities concerning the environment and sustainability.

Many attract membership fees and, related to this, it would seem that the range and diversity of networks in which employees may legitimately participate tends to increase with seniority[46].

Sustainability networks may be topic-based, sector-based or region-based involving mainly 'horizontal' cooperation between companies but increasingly this collaboration can be 'vertical' with the growing appreciation that the next step after moving from confrontational to cooperative relationships within supply chains is to engage in a process of shared development and learning[47].

Whether driven by personal values or a desire to establish the financial business case for sustainability[48] the organisers of such networks act as facilitators rather than instructors. Their role is to provide a framework for learning by selecting discussion topics and initiating collaborative processes amongst participants, a role which therefore also gives them a degree of power over the outcomes. For such facilitators best practice in learning *for* sustainability is to encourage 'critical reflection' rather than merely the dissemination of information from expert to novice, which only amounts to learning *about* sustainability and does not necessary build motivation and capacity for change[49].

Learning in Social Situations

In line with the findings of a recent survey that employees learn as much during breaks and lunch as during meetings[51], the organisers of many sustainability network events build in time for participants to socialise before, between and after sessions. The same is true of the increasing number of sustainability conferences being organised in Australia by professional event organisers, government, industry associations, business groups and NGOs (see Box 4.16). Websites like '*Sustainability Month*'[52] in Victoria help inform people about sustainability conferences and other events.

This follows a pattern also observed overseas, for example, '*The Conference Board*' in New York organises a series of conferences, councils and working groups on all aspects of corporate citizenship[53].

In addition to specific sustainability-focused conferences, environmental and sustainability issues are increasingly to be found on the agenda of regular industry events. For example, the 2004 Australian Gold Conference in Perth adopted as its theme '*Gold: A Sustainable Industry*' [54].

The constraint with this type of learning at conferences and ad hoc network events is that they are often necessarily limited in duration as employees cannot be absent from work for long periods of time. Some sustainability networks therefore place great emphasis on creating a regular program of social functions for building relationships and dialogue (see Box 4.17).

This means that individual participants require well-developed social skills if they are to maximise the learning opportunities available to them. Participants in such networks also need positive feelings of self[56] and to feel that they are in a non-threatening and supportive environment[57] where they are comfortable feeling vulnerable and willing to share risk[58]. This is not always easy when interacting with clients, competitors or even colleagues due to the perceived need to portray competence[59]. Studies therefore demonstrate the importance of trust as a crucial pre-condition for effective learning[60].

Most networks involve face-to-face contact with people present in real time but advances in technology, including chat rooms, instant messaging, discussion boards and list servers, mean that networks can also function in a virtual environment. The CSIRO Sustainability Network, for example, is a 'virtual learning community of practice' dedicated to the inclusive exchange of ideas and information on sustainability and sustainable development[61].

Similarly the Australian National Sustainability Initiative (ANSI) will shortly launch a sustainability network in the form of an online community for all groups and individuals involved in sustainability-related activities in

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**■ Box 4.15
Green Capital**[45]

Green Capital is an initiative of NGO the Total Environment Centre (TEC). It aims to act as a facilitator, researcher and driver of the corporate social responsibility (CSR) agenda through regular forums, workshops, publications, public reviews and newsletters which are sponsored in part by government and private corporations. Green Capital events in Sydney and Melbourne regularly attract over 200 participants.

**■ Box 4.16
Enviro 04**[50]

Quitz Event Management organised the third biennial Enviro conference in conjunction with five industry associations: Australian Water Association, Australian Business Council for Sustainable Energy, Clean Air Society of Australia & New Zealand, Environment Business Australia and Waste Management Association of Australia. The conference incorporated a structured 'social and networking program' which included welcome drinks, a gala dinner and guided sightseeing tours of Sydney.

**■ Box 4.17
Ecochicks**[55]

Ecochicks is a Sydney-based group consisting of over 200 women who work in, or have an interest in, environmental fields. It was formed in 1999 by a group of women working on projects related to the Sydney 2000 Olympics Green Games, who felt the need for some information sharing and networking support amongst other women. The Ecochick philosophy is to promote education and awareness of a variety of issues in an enjoyable social context. Current membership includes a diversity of fields and occupations covering NGOs, private industry, environmental consulting, manufacturing and local and state government agencies. The group distributes a monthly e-newsletter featuring discussion topics, upcoming events and member updates. It also arranges monthly functions which typically involve a guest presenter, site visit, excursion or social dinner.

Australia. It aims to provide a central reference point and educational resource on sustainability issues to stimulate collaboration, facilitate dissemination of sustainability innovations and practical applications and provide research support for the community, business and government[63].

Learning often occurs as a 'by-product' of network activities, but in some cases it is possible to see that learning is the primary purpose around which a network is built[64] (see Box 4.18).

Learning Networks

Such 'learning networks' have a number of common features (see Box 4.19) the primary one being that they all use the principle of shared learning to enable capacity development[65].

They do this by helping participants remain up to date and helping them sort through and prioritise this information[66]. Therefore the more inclusive the network is, the greater the demands on the 'process skills' of participants to reconcile the apparent conflicts arising from differences of perspective and language amongst the various network members.[67]

The best examples of learning networks also allow participants to construct new knowledge by providing environments in which the negotiation of meaning and co-creation of knowledge can occur[68].

This in turn creates the ground for the innovation, adaptation[69] and holistic thinking essential for sustainability.

This is not to suggest however that peer networks are infallible in promoting industry learning *for* sustainability. Firstly, it must be acknowledged that attendance does not necessarily lead to learning. Secondly, for maximum impact, they require that individuals spread the knowledge from their networks into their internal corporate structures[70]. This may not always occur, however, due to time constraints, lack of an appropriate avenue or forum, or because in some contexts employees may jealously guard their learning to further their own self-advancement[71]. Other potential drawbacks include the difficulty for new members to get up to speed, the need to be fairly self-sufficient and motivated, the fact that feedback is often missing and that there can be a 'curriculum of the commons' which leads to unintended learning through errors, misinformation and personal agenda setting.[72]

Peer networks and other forms of informal education have a key role to play in advancing industry sustainability. They place control of learning primarily in the hands of the learner, which ensures the flexibility and relevance needed to build motivation and capacity for change within the fast moving corporate sustainability agenda.

ii) Education for Product Stewardship

Product stewardship recognises the shared responsibility of manufacturers, retailers, government and consumers to manage the impacts of products throughout their lifecycle, including their ultimate disposal[73].

Life Cycle Analysis (LCA) provides a popular approach whereby product stewardship can be achieved (see Box 4.20). LCA is an increasingly common practice amongst progressive corporations. Education relating to product Life Cycle Analysis is currently largely technical in nature. It focuses on re-engineering product design, development and manufacturing processes to enable material efficiency and recovery. However some programs also support the broader industry and local infrastructure development required to implement product reuse or recycling. Best practice approaches to learning associated with LCA are making the connection to organisational change for corporate sustainability and the participatory learning process required to support it[74].

Corporations and governments are using the concept of product stewardship and the practice of Life Cycle Analysis in the following ways:

- Government bodies use them to monitor and regulate *resource consumption, waste and pollution* in an attempt to extend businesses' responsibility for the impacts of their products (see Box 4.21);

- Corporations addressing sustainability are accepting stewardship for their products and employing LCA to *analyse and address* their environmental impacts;

- Global governance organisations also employ product stewardship as an approach to dealing with the broader concerns of *sustainable production and consumption*[76]. This addresses issues such as waste at a more systemic level, engaging with the root cause of the problem (see Box 4.22).

Education is the key to attaining the change outcomes identified above. Some LCA initiatives recognise this and have included an education or informal learning component whilst others are yet to discover the value of this process in facilitating change towards sustainability.

Role of Government in Fostering Product Stewardship

Australian federal and state governments see product stewardship as a policy tool to address a number of sustainability issues, primarily waste management[77]. In Victoria, the EPA, EcoRecycle Victoria and local industry have partnered to develop the '*Towards Zero Waste Strategy*', which outlines several product stewardship initiatives[78]. This strategy focuses on installing systems and infrastructures to support these programs as well as encouraging the development of technical tools to address environmental problems. Such measures aim for greater resource efficiencies to benefit both the environment and the business bottom line.

■ **Box 4.20**
Life Cycle Analysis

'Life Cycle Analysis is a potentially powerful tool which can assist regulators to formulate environmental legislation, help manufacturers analyse their processes and improve their products, and perhaps enable customers to make more informed choices.'

Global Development Research Center (2004, p.1)

■ **Box 4.21**
Producer Responsibility

'In Australia there are already national product stewardship programs in place for products such as mobile phones and consumer packaging. In addition the NSW DEC has released its draft priority statement for Extended Producer Responsibility (EPR) arrangements, which relate specifically to manufacturers taking greater responsibility for their products.'

EcoRecycle Victoria (2004a, p.1)

■ **Box 4.22**
UNEP Life Cycle Forum[75]

UNEP has established an International Life Cycle Partnership with industry bodies to develop and disseminate practical tools for evaluating the opportunities and risks associated with products and services over their entire life cycle. This initiative will translate life cycle thinking into practice and support change towards sustainable patterns of production and consumption.

The partnership incorporates a global life cycle forum to exchange information and to advance the concept of Life Cycle Analysis and Management. It also provides a web site with LCA guidelines and case studies. This approach shares learnings, informs and builds understanding for product stewardship and its associated approaches. The forum could be improved by encouraging the development of local networks and promoting more active collaboration between stakeholders to resolve issues.

■ **Box 4.23**
National Packaging Covenant[79]

This covenant is a policy instrument for managing packaging waste in Australia. It is a five-year agreement signed by government and industry stakeholders in 1999 and based on the principles of shared responsibility through product stewardship. The Beverage Industry Environment Council is a signatory and has developed a waste management action plan as part of the national packaging covenant. The education component of this plan includes accredited professional education of waste educators, best practice seminars for government and industry and public awareness campaigns such as '*Do the Right Thing*'[80]. While these programs are informative, they would benefit from a more participatory approach to solving the waste problem that builds a sense of ownership for the issue across stakeholder groups.

Strategies such as these often place the responsibility for resolving sustainability issues with technical specialists. Product Life Cycle Analysis and the re-engineering process involved in its implementation can be complex undertakings and reliance on technical tools tends to promote expert-driven approaches to achieving sustainability. While technical solutions are vital for sustainability, they do need to be complemented with participatory learning processes that engender a sense of ownership for change towards sustainability across stakeholder groups.

For example, the National Packaging Covenant[81] built partnerships between industry and government and relationships along the supply chain. It is beginning to engage with learning *for* sustainability by facilitating multi-stakeholder dialogue and collaborative decision-making and interaction on issues such as increasing producer responsibility for designated materials and the review of current policies and programs (see Box 4.23). It is also important to secure executive support for 'cradle-to-grave' product management to ensure organisational commitment to LCA.

Australian Government assistance to industry with regard to product stewardship is primarily provided in the form of funding and through the development of best practice environmental standards, for adoption by industry[83]. There is little evidence that government is investing in education to build capacity and support industry to adopt these standards. Instead it chooses to target information to assist communities and individuals to avoid waste and recycle. There are some valuable overseas experiences in this area, for example Environment Canada (see Box 4.24) is fostering product stewardship by providing industry with educational resources and opportunities to build capacity. The resources include manuals, toolkits and guiding principles[84].

The Victorian Government (EPA Victoria) uses Sustainability Covenants to develop product stewardship. These flexible, voluntary partnerships typically involve manufacturers, retailers, consumers and government. The Covenants provide a framework for proactive commitment to increase resource efficiency and reduce the ecological impacts of products and services[85]. Businesses who participate work with EPA Victoria to develop action plans to tackle the issue in question. The covenants seek to build capacity and empower industry to imagine and shape a sustainability agenda in collaboration with other stakeholders. This is in line with learning *for* sustainability, which encourages participatory problem solving and shared decision-making. Business commitment to sustainability solutions is greatly strengthened by their contribution to designing and implementing the solution[86].

Life Cycle Analysis Education and Training

LCA education for Australian business and industry is generally provided by environmental training consultancies. Their courses are designed for environmental managers and those staff involved in quality assurance[87]. This focus on a specific target audience promotes expert-driven approaches to sustainability solutions. The LCA training modules of these consultancies follow a practical, technical environmental management system (EMS) model and treat LCA as a tool or method to understand and address environmental impacts (see Box 4.25).

While technical solutions to environmental problems of course have value they do not in themselves constitute a complete solution to sustainability issues. Business and industry need to complement this practical approach with a more profound reflection on the systemic factors at

the root of these problems, engaging all stakeholders and equipping them with the skills for participatory problem solving. Environmental management consultancies perceive LCA as an extension of pre-existing environmental management systems, which integrates environmental considerations further across the business structure (see Box 4.26). This is a positive recognition that EMSs could be improved by widening the scope of environmental concerns to further audiences.

LCA approaches can foster broader stakeholder engagement by encouraging companies to think beyond the factory gate and look upstream towards their suppliers and downstream towards their customers. Indeed LCA solutions will often only be successful if implemented in partnership with others. LCA could therefore benefit from the incorporation of a more structured process whereby sustainability issues are addressed across company lines and additional stakeholders constructively engaged. Learning *for* sustainability supports that process. It advocates partnership building and fosters collaborative learning for change towards sustainability. The added value of this process has been recognised by the Integrated Sustainability Analysis (ISA) group based at the University of Sydney which has incorporated participatory and iterative learning into a LCA approach to assist with implementing the changes sought (see Box 4.27). This is an innovative program which takes implementation to another level.

When LCA is Aligned with Sustainability

Companies that are looking at product stewardship through sustainability 'glasses' are employing the concepts of LCA to design for the environment[89] going beyond minimizing environmental impact. In Australia, BlueScope Steel uses LCA to re-engineer manufacturing processes and reduce environmental impacts. This company has also developed a decision support tool used in construction to assist in 'green design'[90]. Companies using LCA techniques in this 'eco-design' way are moving closer to sustainability practice by adopting a more systemic approach to addressing environmental impacts (see Box 4.28).

LCA has also been put forward as a decision making tool to assist industry in addressing sustainability issues. It structures information and directs attention to problematic areas of business practice. It has the potential to change people's way of dealing with products and the environment from a focus on end-of-pipe solutions to a life-cycle thinking approach, which tackles environmental problems in a more systemic manner[92]. This is also aligned with learning *for* sustainability, which advocates systemic thinking and building people's capacity for decision-making – especially when it tackles organisational culture.

However, in practice, many corporations deal with LCA more superficially and mainly in a technical way. Although some develop a more sophisticated understanding of environmental issues through this approach, it has also been criticised for its complexity and its failure to question the fundamental values of business practice[93] (see Box 4.29).

Intra-Organisational and Systemic Approaches

The concepts of product stewardship and Life Cycle Analysis extend producer responsibility for a product's environmental, social and economic costs 'from cradle to grave'. Product stewardship encourages a systemic approach to sustainability issues and promotes corporate responsibility for the full impacts of its operations and outputs. This redresses the diffusion of

■ **Box 4.24**
Government Educating for Product Stewardship[82]

Environment Canada has hosted workshops to provide a multi-stakeholder forum for industry, stewardship boards, government and academics to discuss issues that pertain to product stewardship. The objectives were to share information on policies and initiatives, improve idea-sharing and co-operative approaches and to improve the performance and measurement of existing programs. This is good practice in learning *for* sustainability, encouraging multi-stakeholder involvement in decision-making and collaborative, supportive approaches to program evaluation.

■ **Box 4.25**
From Cradle to Grave

'Product life cycle analysis assesses 'cradle to grave' impacts by building an inventory of product system inputs and outputs from raw materials acquisition to production, use and disposal; evaluating them qualitatively and quantitatively; and identifying the system's most significant aspects. Impacts such as resource depletion, human health and ecological consequences are then factored into overall organisational or product development decision-making.'

Pirnie (2004, p.1)

■ **Box 4.26**
Life Cycle Thinking

'Life cycle thinking offers a systemic approach to broadening established EMSs beyond operational control to other business areas such as product development and design.'

Arena Network Training (2004, p.1)

■ **Box 4.27**
LCA Learning as a Change Process for Sustainability[88]

The Integrated Sustainability Analysis (ISA) Group at the University of Sydney attempts to bridge the gap between the technical approach typically adopted by LCA and the need to support corporations engaging in the process of change for sustainability. The ISA Group recognises that achieving corporate sustainability requires not only technology and engineering advances, but also that people's capacities are built for organisational and cultural change.

It is for this reason that the ISA Group has adopted a Participatory Action Research (PAR) approach to its collaborative inquiry into sustainability reporting. It assists the companies who participate to develop their own sustainability indicators, in line with standards such as the Global Reporting Initiative (GRI). Action research is closely aligned to learning for sustainability and provides an established approach through which collaborative and iterative learning creates change in business practice.

■ **Box 4.28**
Partnerships Advancing Industry Sustainability

DuPont, an international plastics manufacturer, has designed an innovative recycling process for polyester that requires the collaboration of its business partners. It is enlisting the help of the entire industry to reshape the polyester business into a more sustainable and profitable form[91]. This illustrates the potential for partnerships to contribute to catalytic change across whole sectors.

■ **Box 4.29**
Limitations of LCA

'LCA is frequently marketed as a tool for use in decision-making, but real-life experience shows that it is far from straightforward. The influence of LCA may remain limited and superficial, if it enters the decision situation with no anchoring in organisational culture and decision-makers personal world-views.'

Heiskanen (2000, p.252)

corporate responsibility brought about by out-sourcing and globalisation[94]. Furthermore, LCA, in theory, brings an intra-organisational context into how sustainability issues are dealt within businesses. The reality, however, is that in most cases LCA remains the concern of environmental staff and lacks integration across corporate functions. Current approaches to LCA professionalise sustainability by internalising it in the existing corporate culture, rather than transforming this culture fundamentally[95]. They lack a learning *for* sustainability approach which sees corporate sustainability as a process of change traversing departmental divisions. These processes are needed to assist with the reorientation and alignment of business to sustainability. Nonetheless, current approaches direct attention to more systemic sustainability issues and suggest action beyond the scope of typical environmental management concerns.

Innovation Across the Organisation
Product stewardship approaches aligned with sustainability make the connection with reorientation of business. This tackles the complexity of organisational change through incorporating the collaborative, context-specific and participatory learning approaches which are required to support it. LCA as a product stewardship approach can shape decision-making and move the focus away from end-of-pipe solutions to life cycle systemic thinking. It seeks active collaboration of stakeholders and provides opportunities for informing and building their capacity to deal with the change needed to align an organisation with sustainability. Currently, there are few initiatives in Australia which take advantage of the added value of education or learning processes for sustainability.

iii) Educating Stakeholders for Sustainability

The more progressive corporations are showing leadership by educating their own stakeholders *about* and *for* sustainability (see Box 4.30). Transnational and national corporations are leading the way in this area[96]. These companies are starting to integrate education and training programs into their Corporate Social Responsibility (CSR) policies and sustainability reporting initiatives[97]. Their conception of corporate responsibility is developing to encompass the company's role as an educator of its stakeholders. How these companies perform in this role is sometimes communicated through Triple Bottom Line reporting (see Box 4.31).

The stakeholder groups targeted by these education and training programs include the companies' suppliers, employees and the local community in which the companies operate. In general the most common programs are those that focus on the community sector. Employee education is less prevalent and usually stems from the requirements of an EMS[99]. Some of the more committed organisations are also training their suppliers to meet environmental standards[100].

General Motors (GM) presents a good example of a company that has embraced its role as an educator of employees, suppliers and customers. It has developed its own '*Framework for EE*' which focuses largely on improving environmental performance and making technical advances[101]. The GM '*Suppliers Partnership for the Environment*' involves working groups established to share learning opportunities from best practice[102]. This collaborative approach to education is in line with learning *for* sustainability. Some of the workshops

focus on technical production and design issues and others on the broader notion of sustainability, such as the '*Communication across Cultures*' program[103]. This reflects the increasing emphasis placed on education for intercultural understanding, as an important element of learning for sustainability[104]. GM's Australian division, Holden, conducts a customer education initiative, which trains approximately 1,500 motorists in Queensland and Victoria each year regarding road safety[105]. These initiatives, when combined, document Holden's sense of corporate responsibility which involves education across a range of stakeholders.

Greening the Supply Chain

The supply chain consists of the business-to-business relationships that every company has with its suppliers. Sometimes referred to as 'greening the supply chain' or 'supply chain environmental management', buyer companies are increasingly requiring a certain level of environmental responsibility in the core business practices of their suppliers. Companies that implement a supply chain sustainability policy can act as key multipliers who encourage change for sustainability in a range of external stakeholder groups that they influence (see Box 4.32).

However, current supply chain sustainability management initiatives mostly focus on complying with environmental standards such as ISO 14001, which focus on environmental performance and do not necessarily address the broader notion of sustainability.

■ **Box 4.30**
Companies as Educators

'Every business has to accept that it can be an educator because of its close links with both employees and customers and should be providing suitable information and education to anyone working for it or purchasing its products and services.'

Welford et al (1998, p.50)

■ **Box 4.31**
NEC Annual Report 2003[98]

The Japanese division of the global information technology corporation NEC conducts environmental awareness and training for its employees. This program consists of a variety of different modules targeted at the needs of different internal audiences. Guest seminars are regularly held to strengthen environmental knowledge and the company has established an online '*Net Ecological Community*' to provide information to employees' families. NEC evaluates employee environmental awareness by looking at the relationship between knowledge and action. The results of this assessment are communicated in its annual report.

■ **Box 4.32**
  Greening the Supply Chain

'All organisations – but especially large companies and public sector organisations – should use procurement as a way of encouraging those in the supply chain to improve environmental performance.'

UK Round Table on Sustainable Development (2004, p.1)

■ **Box 4.33**
  Nokia Environmental Assessments

Nokia issues a questionnaire asking how suppliers manage their processes from an environmental perspective. This acts as a small-scale environmental audit, which focuses specifically on the components that Nokia is using[106]. This approach to greening the supply chain has however been criticised for consisting of little more than an exercise in paperwork[107].

■ **Box 4.34**
  Nike Supplier Training

'Nike, an athletic shoe and apparel manufacturer, provides training for suppliers covering: Nike's corporate environmental policy and programs; master substances; legislation on products and packaging; a sustainability assessment; labor practices information and assistance in reducing and eliminating environmental impacts. Supplier facilities that do not meet Nike's environmental and business standards are offered assistance through Nike Environmental Action Team (NEAT) representatives.'

Pacific Northwest Pollution Prevention Resource Center (2004, p.1)

The approaches used by companies to improve the environmental performance of suppliers typically include:

● Collaborative partnering with suppliers and contractors.

● Developing environmental procurement policies and product specifications.

● Establishing environmental standards or management systems for suppliers (see Box 4.33).

● Outreach and assistance to suppliers.[108]

● Education and training.

Attempts to educate the supply chain range in sophistication from:

● Developing supplier or contractor awareness of the buyer's requirements.

● Helping suppliers conduct environmental assessments and reflect on changes needed.

● Offering support to suppliers by providing access to education tools and information.

● Offering mentoring and/or training to suppliers[109] (see Boxes 4.34 and 4.35).

Some of these forms of supply chain education are more effective in creating change than others. For example, Graham Brown & Associates conduct environmental training for Volvo's dealers and suppliers in Australia[111]. Their program has a strong EMS focus involving environmental audits, training and mentoring of EMS coordinators. While this training does improve environmental performance, it could go further in reflecting on business practice and how it might benefit from change towards sustainability.

A more progressive approach to greening the supply chain is illustrated by Patagonia (see Box 4.36). This illustrates how change for sustainability can be achieved through collaborative learning and the development of action networks which help challenge current practice (see Box 4.37). This represents good practice in learning *for* sustainability.

Westpac's supply chain policy is also progressive and involves sustainability workshops for suppliers who choose to participate (see Box 4.38). Westpac engaged in a collaborative dialogue with a number of external stakeholders before the program was developed and implemented, including the Finance Sector Union (FSU), Australian Conservation Foundation (ACF) and sustainability consultancies with expertise in building corporate capacity for sustainability.

Westpac has already received positive feedback from its suppliers and there is some evidence of initial change being affected by these workshops[113]. Westpac's participatory approach to supply chain education is in line with learning *for* sustainability. In addition to this, these workshops encourage reflection on business practice and how it might be improved to generate more sustainable outcomes.

Insurance Australia Group (IAG) is also working closely with its suppliers to improve sustainability. It has introduced supplier selection guidelines, which include standards for sustainability performance developed in conjunction with its suppliers[114]. IAG is going further than merely assessing performance by also releasing an online learning tool called the 'Risk Radar' which provides smash repairers with practical help in managing environmental and OH&S issues. The benefits of improved practices in supplier workshops can, in turn, translate into reductions in customer insurance premiums[115].

Education of employees is a critical means by which companies can change business practice towards sustainability. Recent research conducted into best practice corporate sustainability in the global water industry has found that companies with a high level of commitment to sustainability are incorporating elements of learning for sustainability into their staff training programs[117] . This education ranges in sophistication from basic training as part of an EMS, to awareness building about sustainability, to education for cultural change, which ultimately involves the development of a learning organisation.

Very often staff education is restricted to environmental training as part of an EMS (see Box 4.39). EMSs provide technical management tools for coordinating practical environmental issues and assist companies to move beyond compliance and address environmental performance. While many EMSs recognise the need to engage staff, in reality staff training typically only involves the provision of information to raise environmental awareness and instruction in how to comply with environmental policy and standards. In addition, few of these programs are evaluated to assess their alignment or impact on change towards sustainability. An exception is Sydney Water which recently invested in a participatory action research to evaluate its 'ESD Awareness' program which all staff are required to undertake (see Box 4.40).

Holden has expressed a commitment to environmental performance in its environmental policy[118]. It concentrates on employee awareness building in line with ISO 14001 and seeks to 'ensure that all relevant employees and contractors are informed and made aware of their personal responsibility to the environment'[119]. This exhibits commitment to meeting environmental standards, but it also assumes that raised awareness and understanding lead to changes in behaviour, which is not always the case.

Westpac, often cited as a leader in corporate sustainability in Australia, does not have a formal internal education program for sustainability. Instead it sees change as occurring through a process of internal communication whereby sustainability concepts and practices are shared with employees through internal media.

Westpac's internal staff newspaper provides a forum for sustainability communication and includes regular updates on corporate responsibility programs and sustainability issues. This includes features designed to inform staff how to incorporate sustainability objectives into their key performance indicators. Company presentations and Human Resources induction programs will usually exhibit content on corporate responsibility and ethical codes of conduct. Currently a booklet on their policy entitled 'Acting Ethically' is included in every induction pack.

The provision of this type of information is important as it raises awareness of company-specific sustainability issues, but this does not necessarily build capacity for change towards sustainability. Toyota Australia is actively working towards this goal with a wide-reaching education program built into its EMS and integrated into its corporate culture. Toyota has implemented a number of capacity-building initiatives including cross-functional teams, workplace champions and executive education programs and its education program extends to suppliers, retailers and even employees in their homes[124].

■ Box 4.38
Westpac Supplier Workshops

'We will set our sustainability goals and expectations for suppliers and vendors by providing written information, and through open days and supplier workshops. We will seek feedback from suppliers on their satisfaction with Westpac and the quality of the relationship. We will establish a supplier forum to enable suppliers to share best practice.'

Westpac (2003, p.5)

■ Box 4.39
Barclays Environmental Training

Barclays is a well-known bank in the UK and considered a leader in corporate sustainability. However its staff environmental training is limited to:

● An intranet site providing detailed information on their EMS and ISO 14001 requirements

● Articles in staff publications

● Online environmental training modules

Only those staff members with formal environmental responsibilities are required to complete these modules[116].

Barclay's environmental training is delivered in an electronic format that provides instructions and guidelines as opposed to enabling creative problem solving approaches through participatory dialogue and decision-making. This prescriptive approach does not really provide opportunities for all staff to engage in a collaborative process of learning *for* sustainability.

■ Box 4.40
Sydney Water Deepens Learning through Participatory Action Research[120]

'*ESD Awareness*' is an interactive on-line training package providing professional development in sustainability for Sydney Water employees. An evaluation of the program was recently undertaken following a participatory action research (PAR) approach, with the objective of identifying whether change towards sustainability was occurring in the workplace. This process involved the employees as evaluators and engaged them in informing the development of subsequent training initiatives.

PAR is a highly innovative approach to program evaluation in that it engages the stakeholders in the evaluation – in this case employees - who have the best insights into the value and limitations of the program. This leads to the development of deeper insights into the corporation's learning process and contributes to partnerships, strengthens a sense of ownership and facilitates dialogue across company divisions. Approaching program evaluation in this way not only improves programs, but also builds internal capacity for change towards sustainability.

■ Box 4.41
Corporate Universities

The term 'corporate university' encompasses a range of conceptions regarding what constitutes learning in the corporate environment. In some instances it is simply re-badged internal training, and in others it involves re-visioned learning programs that seek to establish a learning organisation, capable of achieving change for sustainability[121]. Some progressive corporations are using these infrastructures for EE.

While there are 1600 corporate universities in North America (including General Motors University - GMU[122]) Australian companies have not followed this trend of establishing 'corporate universities'[123].

Corporate sustainability therefore requires the development of a learning organisation capable of reflecting on business practice and actively engaging with its employees andother stakeholders to define what its role is in the achievement of sustainability.

Thought leaders in corporate change management have continuously pointed to the critical role that the creation of a learning culture has in developing an organisation capable of achieving change for sustainability[126]. Corporate sustainability involves all stakeholders in understanding the systemic impacts of current business practice, identifying opportunities to improve practice and participating in the decision-making process regarding what change should take place and how. Companies with learning cultures will encourage not just the implementation of collaborative change, but also reflection on the actual process of change and an evaluation and review of its efficacy.

Educating the Community

The growing acceptance for CSR and recent crises in corporate governance have highlighted the requirement for business to openly communicate with its community stakeholders, to consider their needs more seriously and to 'give something back' to the locality in which it operates.

Like many companies, City West Water uses its sustainability report as a means to communicate to its stakeholders (see Box 4.44). In 2003 it was joint winner in the 'Best Sustainability Report' category of the Association of Chartered Certified Accountants (ACCA) Australia and New Zealand Awards

for Sustainability Reporting together with two other water companies – Sydney Water and Watercare Services[127]. While transparent reporting alone does not educate *for* sustainability, it is an important component of the process.

Companies committed to Corporate Social Responsibility are engaging in outreach programs to educate the communities in which they operate. Very often these programs focus on the general education of disadvantaged groups[128]. The emphasis here is on regeneration of degraded communities in the interest of fostering social equity[129].

Education targeted at the consumer often takes the form of social marketing programs. These programs are designed to change consumer behaviour through the provision of information (see Box 4.45). This is usually related to a broader policy acknowledging corporate responsibility for products throughout their life cycle. These social marketing techniques will build awareness for sustainability but are limited as they do not address the systemic factors at the root of unsustainable consumption.

Change in consumption patterns requires reflection on what drives them and the needs they fulfil. For example an anti-littering campaign can go further than encouraging responsible disposal of litter to encouraging consideration of why such packaging is required in the first place. Learning *for* sustainability facilitates such reflection.

As part of a broader commitment to social responsibility, corporations also seek to financially support educational institutions, and encourage them to provide opportunities in learning for sustainability (see Box 4.46). General Motors has partnered with American educational institutions to integrate EE programs into the primary and secondary school curriculum[133].

Investors as Educators

There is growing interest from the financial sector in business learning for sustainability[134]. This is linked to the increasing demand for Socially Responsible Investment (SRI). Private and institutional investors are aware of the heightened risk associated with unsustainable business practice, as evidenced by the negative impact of the events at Ok Tedi on BHP Billiton's share value.

This has encouraged the development of sustainability indices such as the Dow Jones Sustainability Index (DJSI) and the funds managed by sustainable investment institutions such as Sustainable Asset Management (SAM). These factors influence how publicly quoted companies respond to sustainability issues and motivate them to engage in Triple Bottom Line (TBL) reporting (see Box 4.47 and Box 4.48).

In order to be listed on sustainability indices companies usually undergo an assessment process. This evaluates the extent to which the company in question fulfils the sustainability requirements of the index. This typically involves an assessment questionnaire, review of corporate policies and reports, media screening and interviews[139]. The actual process of sustainability assessment can also become a learning exercise for corporations in what constitutes best practice in corporate sustainability[140].

While feedback from sustainable investment institutions can encourage improvements in corporate sustainability policy it is not aligned with learning *for* sustainability. It might motivate companies to reflect on business practice but it will not necessarily equip them with the skills to tackle complex sustainability issues.

Box 4.42
HP Enabling Learning

Hewlett-Packard (HP) is a global IT company known for its entrepreneurial and highly innovative team-based working environment. That sense of collaborative innovation is now being applied to developing corporate sustainability strategies. Core to the success of this participatory approach is HP's ongoing investment in human capital, which has helped a learning culture to evolve. Management actively encourages a culture of continuous learning to allow the expression of innovative ideas and practices[125].

Collaboration for sustainability also relies on the development of enabling organisational structures. Smaller division and cross-functional teams enable HP employees to communicate freely, diffuse ideas and exchange knowledge. This points to the importance of organisational change for sustainability, and how a learning culture can support that change.

Box 4.43
Learning Capacity

'How sustainable a system is ultimately becomes a measure of the learning capacity of the community in relation to its environment.'

Allen et al (2002, p.35)

Box 4.44
Community Education at City West Water

'Engaging with stakeholders and incorporating their views into our business activities and planning processes is an integral part of the way City West Water conducts its business. Education is one of the key elements that facilitates our community engagement.'

City West Water (2001, p.40)

■ Box 4.45
BATA Anti-Litter Program

British American Tobacco Australia (BATA) developed an anti-litter action plan under the auspices of the National Packaging Covenant. It involved awareness building programs targeted at the community, such as the '*Do the Right Thing*', a national social marketing campaign.

'In conjunction with non governmental organisations we are committed to developing a comprehensive anti-littering strategy and approach including behavioural research, partnerships with councils, implementation trials and education and communication.'

British American Tobacco Australia (2001, p.39)

■ Box 4.46
Corporations Partnering with the Formal Education Sector

An increasing number of companies committed to sustainability are actively engaging with the formal education sector. In Australia corporations such as Rio Tinto and Sensis are collaborating with tertiary institutions such as Deakin University and the Royal Melbourne Institute of Technology (RMIT) with the goal of increasing the understanding of sustainability of all involved. This has contributed to the development of centres of excellence for corporate sustainability, such as the 'Global Sustainability Institute' at RMIT, the 'Corporate Citizenship Unit' at Deakin and the 'Corporate Sustainability Project' at the University of Technology Sydney (UTS)[130].

In China BP has developed an 'Environmental Educators Initiative'. This is an innovative tri-sector partnership between the Worldwide Fund for Nature and the Chinese Ministry of Education. It aims to create change towards sustainability by building capacity across the sectors[131]. In the case of BP this resulted in the corporation itself developing a much more profound knowledge of what is involved in learning for sustainability. It resulted in more effective education programs being funded by BP in Chinese schools, as well as triggering reflective workshops for BP staff on how to manage change towards sustainability[132].

■ Box 4.47
Investment as a Driver for Sustainability

'There is no more powerful pressure for change than the withdrawal of investment from public companies or the flow of capital to them.'

Dunphy et al (2003, p.289)

■ Box 4.48
Learning about Sustainable Investment

Some global financial institutions have adopted a more formal role of educator to other institutional investors.

The International Finance Corporation (IFC) funds global development initiatives and seeks to share its expertise in sustainable investments with its private clients. It trains its staff to inform investment clients of the benefits from improved environmental, social development and effective corporate governance[135].

This trend is reflected in Australia, where the Ethical Investment Association has begun the development of education programs for financial planners to understand the nature of SRI and the SRI products being offered in the market[136].

The Global Reporting Initiative (GRI) attempts to inform its members through e-networks such as the InterAct Forum. This is an online discussion group where the GRI's network of 5000 members can exchange ideas and information on sustainability reporting, the GRI framework and other associated issues[137].

The UNEP Finance Initiative explicitly seeks to build capacity for sustainability. It is made up of member companies from the financial services sector worldwide and aims to identify, promote and realise the adoption of best environmental and sustainability practice at all levels of financial institutions. It does this through professional development programs and action-oriented reports to major international conferences that also facilitate network-based learning[138].

It is encouraging to see corporations begin to educate and train their stakeholders *about* sustainability. However many are yet to make the shift towards learning *for* sustainability. Initiatives tend to focus on building environmental awareness, and training suppliers and staff to make technically oriented improvements in practice. There is evidence to indicate that sustainable investment is encouraging large corporations to address sustainability issues, but this involves a limited education component that is more aligned with building awareness than encouraging reflection on practice. Learning *for* sustainability involves the participation of stakeholders in an iterative process of change.

iv) Resources and Tools for Change

Australian companies wishing to engage with sustainability are presented with an array of toolkits, guidelines and other resources covering a range of topics and possible approaches. Many of these have been developed in Australia by the federal government, state governments, industry associations and individual companies, sometimes in collaboration with NGOs[141].

In addition, access to the Internet has meant that sustainability resources developed overseas are also readily accessible to companies in Australia. Many of these resources are available free of charge, although some are developed for commercial gain and as such attract a license fee (see Box 4.49).

It is perhaps due to the non-commercial nature of the majority of these resources that few are updated on a regular basis, if at all. The sustainability agenda is evolving rapidly, yet a recent study[143] of Australian toolkits and other resources for industry sustainability identified several that were still being actively promoted but which had not been reviewed since being launched up to five years previously. Similarly few resources had been evaluated for uptake or effectiveness.

Outdated or ineffective resources exacerbate the information overload reported by companies in Australia who are confused by overlapping and sometimes contradictory advice. Small-to-Medium Sized Enterprises (SMEs) in particular struggle with a plethora of resources from 'well meaning' information suppliers[144].

Untargeted Resources

The same study[146] found that the majority of sustainability resources do not target any particular audience, but rather business in general. Those that do target a more specific audience tend to be aimed at companies of a certain size or sector. Similarly the majority of resources do not target a specific role or job function, although a top-down approach is prevalent with a number of resources focusing on the requirements of senior managers in addressing sustainability.

Senior managers can extend the reach and impact of a resource because they act as 'key multipliers' passing on what they have learned to their staff. However, few resources appear to capitalise on this by providing key multipliers with explicit tools for this purpose. The Australian Government Department of the Environment and Heritage's 'Sustainable Minerals Training Kit' is one exception (see Box 4.50).

Untailored content stemming from the absence of a clear target audience may contribute to the apparent lack of adoption of many of the sustainability toolkits, guidelines and other resources available to industry. In addition a lack of sufficient time and money is given as a key impediment[148]. It appears that the developers and sponsors of such resources face the same challenges themselves, with few 'walking the talk' and adopting the tools and approaches that they are promoting. The Australian Government Department of Family & Community Services is a notable exception (see Box 4.51).

■ **Box 4.49**
Proprietary Sustainability Software

StakeholderEngage™ is an online TBL reporting tool which allows organisations to input, manage and publish sustainability data. It is compatible with the Global Reporting Initiative and organisations can also customise their own reporting indicators. Orica is an example of a company using this product, which in 2003 attracted a base fee of $2,800 per year[142].

■ **Box 4.50**
Training the Trainer

The '*Sustainable Minerals Training Kit*'[145] complements a series of booklets describing best practice in key areas of environmental management in mining. The Training Kit assists trainers in planning and delivering training sessions based on the booklets and provides presentation slides, notes, a selection of case studies and worksheets.

■ **Box 4.51**
Walking the Talk

In 2004 the Department of Family and Community Services (FaCS) published the first TBL report by an Australian Government Department[147]. The report detailed its performance against economic, social and environmental indicators, which were selected from FaCS' own 'Guide to Reporting against Social Indicators', the Australian Government Department of the Environment and Heritage's 'Guide to Reporting against Environmental Indicators' and the GRI. In having been through the process itself, FaCS is better able to assist industry to do the same.

■ Box 4.52
Partial and Simplistic Tools

'Our review of the current literature on sustainable development and business success concludes that approaches are generally too partial or simplistic to provide meaningful insights into the relationship between the two. Examples of partial approaches include the many tools that can be applied, most typically at operations level, to address a sub-set of the full range of sustainable development issues. By not attending to the balancing of these issues, and the trade-offs required between them and the other priorities of business, these approaches fail to address this, the most crucial dilemma for practitioners.'

Goldsmith & Samson (2002, p.III)

■ Box 4.53
Influencing the Supply Chain

The New Zealand Business Council for Sustainable Development (NZBCSD) has produced a practical '*Business Guide to a Sustainable Supply Chain*'[153] which details five steps to implementing a sustainable supply chain with a number of suggested models and templates for companies to follow.

■ Box 4.54
Internal Change

'In the past 20 years or so it has been 'easier' to concentrate on corporate social responsibility as something effectively external to an organisation's internal workings, with little of the activities involved seriously changing internal corporate behaviour or ethos, except where a major crisis has initiated that change. Holistic corporate citizenship is very much more demanding than that, and requires, I would suggest, if it is to be effective at all, that internal behaviour changes so that every decision that is made at every level of an organisation is measured against deeply rooted principles of corporate citizenship.'

David Birch (2001, p.55)

The NSW Department of the Environment and Conservation (DEC) found that managers and owners are less interested in long-term business growth than in immediate savings and therefore rarely invest in sustainability initiatives that have payback periods beyond 2 or 3 years[149]. As a result many of the sustainability resources currently available focus on specific aspects of environmental performance, such as eco-efficiency, which can deliver immediate economic benefits. However they do come under criticism from proponents of learning *for* sustainability approaches (see Box 4.52). The focus on short-term outputs tends to result in minimal consideration of how to encourage longer lasting outcomes and change[150].

In addition to the cost-saving carrot, many resources promote the potential gains to be had from increased and positive stakeholder recognition for a participating company. Sometimes this is formalised in the form of public accreditation or acknowledgment, as is the case with EPA Victoria's Sustainability Covenants[151] for example. Other resources choose to employ more of a stick to encourage participation, for example Reputex[152] publishes its reputation rankings regardless of whether a company decides to take part in the survey or not. This type of pressure is less likely to lead to lasting commitment and change.

Most sustainability resources aim to influence change from within an organisation, in line with the assertion that sustainability programs imposed from the outside are generally short lived and unsuccessful and that therefore leadership from the inside is necessary for sustainability to be integrated into an organisation[154]. However there are also examples of resources that encourage external groups, such as investors or the community, to place indirect pressure on companies to act more sustainably. Business to business pressure is also evident as sustainable supply chain management is increasingly recognised as a mechanism for change, with resources starting to be developed internationally to support businesses that wish to exert this kind of influence (see Box 4.53).

Short Term Outputs

This type of approach demonstrates a focus on longer-term changes as opposed to the short-term outputs which are the focus of many of the resources. TBL reporting is particularly popular, with many resources in Australia and overseas devoted to this issue. But whilst sustainability reporting and other external actions can be visible and tangible 'quick wins' for businesses they do not necessarily result in deep change within an organisation (see Box 4.54). They also only form part of the sustainability equation.

Indeed the Barton Group[155] found that the value of TBL reporting lies not in the reporting itself but in the analysis that accompanies it. They believe that smaller companies in particular are being encouraged to report for no good reason without doing the analysis, which does nothing to help them and can even be a retrograde step[156]. This is echoed by the recent '*Mays Report*' which noted that while transparency is an important aspect of sustainability, embedding the concepts internally in order to add shareholder value is the most important issue[157]. There are few resources currently available to help companies do this.

Some resources, such as the Greenhouse Challenge (see Box 4.55) have been successful in placing a focus on action as a necessary precursor to change. However

the production of an action plan does not always lead to action - the evaluation of the National Packaging Covenant noted that few companies are setting measurable numerical targets, providing a sound system for collecting relevant data or identifying the necessary resources to meet product stewardship commitments[158].

The benefit of initiatives which require the development of individual company action plans is that they redirect the focus from a one-way dissemination of information from expert to company, to a capacity building approach that allows the company to take ownership and control. However the majority of sustainability resources are far more prescriptive in nature, telling companies exactly where they should go and how they should get there. This model doesn't allow companies to imagine and define their own futures, a process which is critical if they are to motivate and align themselves with change towards sustainability. For environmental tools and resources to effectively assist industry with sustainability they need consider a more comprehensive approach and to go beyond disseminating information to building real capacity for change.

■ **Box 4.55**
Action Plans for Change

An evaluation of the Greenhouse Challenge found that 'the need to develop action plans for consideration by the CEO and government is helping to build capacity within organisations to develop accurate inventories, assess abatement options and place greenhouse emissions in a broader business context...in a few cases these management changes are starting to translate into specific changes to investment criteria.'

Australian Greenhouse Office (1999, p.42)

v) Beyond Compliance Education

■ **Box 4.56**
Solutions to Pollution

The NSW Department of Environment and Conservation (DEC) education for compliance program targets small businesses that have a heavy impact on the environment. Their '*Solutions to Pollution*' initiative involved Councils working with a priority local industry type to develop an environmental information booklet. They have produced fourteen information booklets addressing small businesses such as construction and automobile services. The booklets address legal responsibilities and opportunities to reduce environmental impacts such as storm-water, hazardous waste and air quality.

The goal is to provide concise information on high priority environmental issues with a clear identification of legal responsibilities and suggestion of simple solutions[159]. This approach is typical of compliance education, which tends to makes a (simplistic) connection between the provision of information and behaviour change in the target audience[160]. This is more aligned with education *about* the environment approaches.

Education that aims to establish compliance with environmental regulations is a significant trend in the business and industry sector. Compliance education is predominantly developed and delivered by government bodies at the federal, state and local levels. It limits its scope to building awareness of environmental regulation and the simple, tangible measures that can be taken to comply with it (see Box 4.56).

Government[161] tends to view education as one tool in a suite of policy instruments used in environmental regulation[162]. Other measures employed include economic incentives and the threat of legal action.

EPA Victoria uses a range of such measures to address corporate sustainability. These include statutory tools, environmental audits, building partnerships for business sustainability and co-funding for resource management projects. Education programs in the area of environmental regulation are tied into existing professional training frameworks provided by Technical and Further Education (TAFE) and Vocational Education and Training (VET)[163].

Through its accredited licensee system, EPA Victoria also rewards sound environmental systems and high levels of environmental performance with flexibility for companies and freedom from the standard prescriptive approach to works approval and licensing[164]. In 2004 Toyota Australia, for example, was granted such a licence in recognition of its Environmental

Management System, Environmental Audit Program and Environment Improvement Plan which the EPA viewed as particular initiatives that demonstrated the company's capacity to maintain and improve its high level of environmental performance[165].

Some educators addressing industry compliance with environmental regulation recognise that much deeper levels of learning and change are required for sustainability to be achieved[167] (see Box 4.57). Others perceive the value of compliance education to be its potential to instigate further change within organisations[168]. This assumes that once fundamental environmental compliance measures are in place the company will then address more substantive sustainability issues. However there is little evidence to support this claim. In fact companies may feel they are 'doing their bit' for the environment by complying with regulation, without addressing deeper sustainability issues in any way.

Compliant companies exhibiting good practice will undertake staff training to ensure their employees are aware of environmental legislation and sound environmental management practices (see Box 4.58).

Canon is a global electronics company with a significant presence in Australia. It has implemented an integrated environmental management system and trains staff to incorporate environmental assurance in their daily activities. However, its annual

reports indicate that it approaches education in a way that is similar to OH&S training[169]. It recognises that increasing the quantity of staff in environmental assurance training will lead to better environmental performance. However while Canon reports on the number of employees trained, it does not communicate the process, focus or most importantly the outcomes of the training. This is a trend in many companies with EMSs and engaged in environmental reporting[170]. Their annual reports make no reference to how they are developing skills to implement what they have learnt.

Collaborative Problem Solving

Perhaps the most innovative program, and that most closely aligned to learning *for* sustainability in this area is that of the Western Australia Sustainability Industry Group (WASIG) which recognises the need for collaborative problem solving and provides opportunities for building capacity in this area (see Box 4.59).

EPA Victoria's Sustainability Covenants discussed in previous sections are also a good example of non-prescriptive, collaborative approaches to legislation that help foster sustainability.

Corporate sustainability requires the linking of learning cultures with participatory management processes [172]. It also requires multi-stakeholder learning partnerships. The reality, however, is that while collaborative problem solving approaches are advocated, they are not always implemented in government programs[173]. Where government does attempt to educate beyond compliance it tends to focus on communicating knowledge or building the business case for

sustainability. This consideration of the economic benefits associated with cleaner production practices and product stewardship[174] is key for industry uptake. However there is often an underlying assumption that once organisations acknowledge the need for change, they will also have the capacity to implement that change.

■ **Box 4.57**
Progressive Stages in Corporate Sustainability

The evolution of sustainable business organisations can be mapped out as follows:

1. **Compliance** – environmental considerations only of concern if obliged by law.

2. **Performance** – improved environmental management leads to greater resource efficiency and reduced costs.

3. **Stewardship** – extended producer responsibility for product impacts; sustainability perceived in terms of benefit to long-term shareholder prospects and continued license to operate.

4. **Social responsibility** – management seek to establish culture that is committed to meeting stakeholders interests and needs (not just shareholders); profit is the goal, but not at any cost.

5. **Learning organisation** – stakeholders in the business develop capacity to reflect on their roles in achieving sustainability and are actively involved in decision-making and change for sustainability.

■ **Box 4.58**
In-House Environmental Training[166]

Hunter Water conducts internal environmental training courses. They are practical, hands-on and interactive addressing the following concerns:

● General environmental awareness.

● Environmental awareness for field staff including emergency response.

● Environmental due diligence including understanding of environmental legislation.

■ **Box 4.59**
Partnerships for Learning[171]

The Western Australia Sustainability Industry Group (WASIG) is a multi-stakeholder platform of business, public sector, environment and engineering education professionls. WASIG is a member of the Regional Network of the World Business Council for Sustainable Development (WBCSD) and a signatory to the International Declaration on Cleaner Production administered through the United Nations Environment Programme (UNEP).

WASIG is committed to the pursuit of corporate sustainability. It defines this as delivering innovative and competitive goods and services that bring quality of life to all while protecting ecological integrity. WASIG views sustainability as a market driver and a potential source of differentiation from competitors. It has a focus on the achievement of cleaner production and eco-efficiency.

WASIG seeks to build partnerships, engage stakeholders, foster dialogue and provide a platform for learning from best practice. This collaborative problem-solving approach represents good process in learning *for* sustainability.

vi) Education Relating to Environmental Performance

■ **Box 4.60**
Profound Change Required

'Few companies have distinguished between the need to improve their environmental performance and the broader notion of sustainability. Those that have made this distinction recognise that sustainability involves an organisation in profound examination and change of its social and environmental identity, its purpose and its practices.'

Roome and Oates (1997, p.165)

■ **Box 4.61**
Profiting from Cleaner Production[175]

In NSW, DEC runs an Industry Partnership Program that provides matched funding for individual businesses to encourage investments in improving environmental performance. Project officers are currently actively engaged with 29 industry partners. Advocacy of industry champions, case studies, demonstration sites, media coverage and industry sector events are all tools being used to promote the benefits of changing practices.

Emphasis is placed on marketing the idea of cleaner production to a target audience as opposed to embarking on a collaborative learning process for change. Educational support is focused on the inclusion of environmental Competency Standards in National Training Packages and increasing environmental content in existing TAFE courses[176].

Many education initiatives targeted at business and industry are based upon tools and concepts that enable managers to improve environmental performance. These include programs on cleaner production, eco-efficiency, environmental auditing and environmental management systems. The goals of these education programs are mostly to attain incremental change to benefit the environment and to enable greater resource efficiencies for businesses, with the hope of motivating further change. In practice, they focus on the implementation of short-term and largely technical measures to 'green' business practice. They have been criticized by some, including Nigel Roome and Angela Oates who argue that more profound change is needed to align business with sustainability (see Box 4.60).

Cleaner Production and Eco-Efficiency Initiatives

State government is a significant provider of education relating to environmental performance. It frequently uses the concepts of cleaner production and eco-efficiency as a means to communicate simple, concrete measures that can be taken by industry to reduce costs and move beyond compliance with regulation to a more progressive environmental stance.

'*Profiting from Cleaner Production*' run by the NSW DEC illustrates what is involved in this type of government education (see Box 4.61). This program employs social marketing techniques to increase awareness for resource efficiency. It attempts to address business drivers, based on the assumption that providing such motivational information will lead to a change in behaviour.

Such an approach can treat stakeholders in sustainability as target audiences whose behaviour needs to change in a predefined manner[177] which does not necessarily encourage a sense of ownership of the problem, nor the motivation to resolve it[178]. This type of commitment is more easily achieved through collaborative problem solving.

Learning *for* sustainability engages stakeholders in a dialogue about what change is required and builds their capacity for how it might be achieved. The education component of '*Profiting from Cleaner Production*' seeks to develop the technical skills necessary to measure and improve performance. Although this program has done much to promote environmental measures, the deeper learning needs required to shift organisations towards sustainability are not addressed. Learning *for* sustainability develops participatory problem solving and decision-making skills; it encourages collaborative reflection on practice and builds capacity for organisational change towards sustainability. This makes the learning process more relevant and specific to the context of the organisation in question and assists in the development of action strategies for change.

Cleaner production programs such as these are run on the basis that incremental improvements will lead to more profound organisational change. The short-term returns provided by improving environmental performance are intended to motivate further measures to achieve long-term change[179]. However, while a company is focused on cleaner production practices it is not likely to consider transforming business practices more fundamentally[180] (see Box 4.62). The risk is that businesses engaged in improving environmental performance believe that incremental change is adequate, and fulfils their duty to the environment[181]. Some commentators argue that it can provide a means to 'greenwash' their practices, avoiding the more fundamental challenges of sustainability[182].

The Queensland EPA also focuses on improving environmental performance. It places emphasis on assisting industry to develop technology solutions to progress sustainability. Its Sustainable Industries Division recognises that enforcement plays a role and believes that the solutions that will bring the greatest returns for business and the environment lie in improving processes and systems[184] (see Box 4.63).

These education efforts focus on providing training and tools related to achieving resource efficiency. Broader education that equips organisations and their stakeholders to reorient business to sustainability is required if industry is to move beyond improving environmental performance alone.

Environmental Management and Auditing Systems

Government is not the only provider of education for improved environmental performance. The Collaborative Research Centre for Waste Management and Pollution Control (CRC WMPC)

also educates practicing professionals in the environmental management industry (see Box 4.64). It places emphasis on EMSs as critical tools for improving environmental performance and advocates a technical approach to EMS training that focuses on technology development and transfer[185]. Even when the goal is implementation of an EMS, to be effective such systems require integration across the organisation and the involvement of all staff. The Sustainability Management Systems (SMSs) that are starting to be adopted do go further in addressing this requirement for a more integrated approach.

The need for adequate training and whole-of-company engagement for the effective implementation and management of EMSs has been noted by Stephen Tinsley[186] (see Box 4.65). Education and training consultancies have attempted to meet this requirement. Some of these organisations aim to address sustainability and issues of cultural change, however their training modules do not always reflect this[187]. They tend to focus on environmental awareness training, environmental impact assessment training and the implementation and management of EMSs[188]. The predominant approach to education here is technical training about environmental management. Although important, it alone cannot foster the collaborative learning that crosses company divisions required for change toward sustainability.

Environmental auditing is another significant component of environmental performance initiatives (see Box 4.66). Auditing is essentially an information gathering exercise. The best potential outcome of this procedure is a commitment from companies to a cycle of improved environmental performance through practical, technology-based action.

■ **Box 4.62**
The Environment as an Add-On

'Eco-efficiency essentially works on the trade-off between industrial activity and the environment, continuing to do business-as-usual and adding in concern for the environment. Rather than being centre-stage, ecological issues are appendages which drop off when the going gets tough.'

Welford (1998, p.1)

■ **Box 4.63**
Sustainable Industries[183]

The Queensland EPA Sustainable Industries Division has defined its goal as 'to move beyond compliance levels of environmental performance to new standards of eco-efficiency and eco-marketing'. The training provided to meet this goal is delivered largely in partnership with key industry associations. The EPA provides tools to assess eco-efficiency, audit energy and water use and make environmental reviews, along with practical help for businesses to develop strategies and codes of practice.

■ **Box 4.64**
Collaborative Research Centre for Waste Management and Pollution Control

'The CRC WMPC educates, trains and transfers technology by other means in the following program areas:

● Wastewater treatment and water reuse.

● Solid waste management.

● Contaminated site remediation and hazardous.

● Waste treatment.

● Waste minimisation and cleaner production'.

Collaborative Research Centre for Waste Management and Pollution Control (2004, p.1)

■ **Box 4.65**
Importance of Education and Communication

'Lack of education, communication and technology can act as barriers, particularly if not diffused successfully throughout the organisation. While a number of organisations are attempting to introduce EMSs, often those managers tasked with that responsibility lack the necessary training and education. Those managers who have the required levels of education and training know the importance of raising levels of environmental knowledge amongst other employees.'

Tinsley (2002, p.378)

■ **Box 4.66**
Environmental Auditing

'Environmental audits are used to measure, monitor and evaluate an organisation's Environmental Management System (EMS) and its environmental performance. A combination of 'hands on' case studies and supporting theory relating to legislation and due diligence are reviewed. Current EMS specifications and guidelines and the audit process are covered comprehensively.'

SAI-Global (2004, p.1)

■ **Box 4.67**
Beyond Environmental Performance

'There has been much debate about appropriate tools for the improvement of the environmental performance of companies. We have seen the introduction of environmental management systems and their associated standards, environmental auditing and reporting and tools focusing on the environmental performance of products such as life cycle assessment. However, there is now a need to go further than simply addressing the environmental performance of companies if our aim is to be sustainable development.'

Welford et al (1998, p.38)

However this involves an assumption that further change for the environment will be catalysed once initial assessments have been made and technical measures have been put in place. Many use the auditing process to educate companies about the need to improve environmental performance. Lasting change for sustainability requires a process of reflective and collaborative learning that helps businesses to explore unsustainable business practices in a more systemic manner. This reflective practice particularly needs to occur in terms of building the business case for a company, as sustainability cannot be viewed separately from the financial demands of investors.

Leading thinkers in the corporate sustainability debate have recognised that resource efficiency is not only about changing raw materials, processes and products but also about changing corporate culture through a participatory learning process[189]. The cross-disciplinary, cross-functional nature of sustainability issues reinforces the need to reform not just culture, but organisational structure[190]. Corporations need to be supported in this process of change and encouraged to develop a learning mindset that enables response to sustainability issues[191] (see Box 4.67).

This is not always reflected in attempts to educate for improved environmental performance. Some of these education programs still adopt a top-down expert-driven approach to providing information intended to change behaviour (see Box 4.68). This does not build the capacity of companies to form their own solutions to sustainability issues in partnership with other stakeholders. This 'expert' approach also does not extend to education that builds the participatory decision-making and problem solving skills required for change toward sustainability.

Stephen Tinsley argues that employee involvement through group learning situations is a more effective change mechanism than relying on solutions from experts[194]. Therefore best practice programs involve collaborative problem solving and acknowledge that industry does not want to be told what to do, or how to do it.

EcoSTEPS is an Australian consultancy that encourages business and industry to move beyond environmental performance and address the broader notion of sustainability. It does not advocate a pre-formulated solution but instead equips organisations with the tools to develop their own answers to sustainability issues. EcoSTEPS' conception of sustainability is based on the framework provided by The Natural Step[195]. This consultancy offers an introductory one-day workshop '*Sustainability – Principles into Practices*' that is participatory in its approach and encourages reflection on the environmental and social impacts of business practice. EcoSTEPS also provides tailored consulting services and aims to act as a change agent facilitating and supporting organisational change towards sustainability.

More Systemic Approaches to Sustainability

The need to adopt a systemic approach to achieving sustainability has been recognised by many commentators such as Stephen Sterling and Jodi Smith[197]. International best practice in cleaner production, as advocated by UNEP, is beginning to recognise the importance of systemic thinking in resolving sustainability issues (see Box 4.69). UNEP has addressed this by promoting LCA approaches to change production practices more fundamentally (see previous theme on Product Stewardship). While this is a step in the right direction,

programs such as these could benefit from incorporating learning *for* sustainability. Lasting change for sustainability requires not only improvements to technology processes and systems, but also a more systemic and collaborative reflection on business practice and how it might be improved.

Environmental performance education encourages incremental improvements in business practice rather than transformative change towards corporate sustainability. It can encourage the development of expert-driven technical approaches for the resolution of sustainability issues. The development of learning cultures and capacity building for organisational change towards sustainability is not often addressed, nor is education viewed as a tool to achieve that change.

Sustainability is not a destination for business organisations to reach, but an ongoing learning process. Educators need to build the capacity of business and industry to address sustainability issues at a more systemic level, and to collaborate with multiple stakeholders for their resolution.

■ **Box 4.68**
Top-Down Approaches

The EPA Victoria '*Good Practices for Cleaner Production*' handbook includes sections on waste assessment, improving purchasing and storage, conserving energy and water, reducing waste and risk and improving information and systems[192].

EcoRecycle Victoria also educates business and industry for resource efficiency as part of its '*Waste Wise Business Program*'. Its industry advisors provide on-site technical assistance with waste assessments and developing waste reduction solutions[193]. While this education is more collaborative the focus is on the implementation of expert-driven technical measures.

■ **Box 4.69**
Systemic Approaches to Resource Efficiency

UNEP developed the concept of cleaner production and provides significant resources to finance, educate and support National Cleaner Production Centres in countries worldwide[196]. It has since recognised the failure of this concept to address the systemic nature of sustainability issues. Emphasis is now placed on the need to take a life cycle approach to production, such that companies take stewardship of their products from manufacture to waste management. This is beginning to be addressed by the UNEP Capacity Building for Cleaner Production Centre, which has developed a training module entitled '*Sustainable Consumption and Production: Making the Connection*'.

vii) Formal Education and Training for Industry – Contributions from the VET Sector

■ **Box 4.70**
**Environmental Degradation
and Reversal**

'Technical and vocational education
has provided the skilled manpower for
agricultural and industrial development,
which has been one of the main sources of
environmental degradation. Technical and
vocational education should therefore play
an active role in helping to deal with these
problems through its programs.'

UNESCO in Anderson (2003 p.7)

■ **Box 4.71**
**NSW Environmental Education
Plan**[203]

'Strategy 2.4: Influence the National
Vocational Education and Training Sector
to integrate sustainability principles and
practices into National Training Packages.'

NSW Government (2002, p30)

With one in eight working-age
Australians currently enrolled in
Vocational Education and Training
(VET) programs[198] the VET sector[199] has
a key role to play in educating current
and future employees about and for
industry sustainability.

In promoting industrial and
technological practices, the VET sector
has come under criticism in the past by
international agencies such as UNESCO
for placing too much emphasis on
economic growth and productivity[200]
at the expense of the environment (see
Box 4.70). To be fair this has largely
been driven by market demand, but as
industry increasingly takes responsibility
for its environmental and social impacts,
VET will need to reassess its role and
accommodate the new knowledge, skills
and attitudes required by the sustainable
workplace of the future[201].

Western Australia's Sustainability Strategy
notes that although universities are able
to assist through emerging disciplines
such as environmental design, the
flexibility of the VET sector means it is
best able to respond quickly to the needs
of industry for many of its re-training
and accreditation requirements[202]. This
is highly relevant for the rapidly growing
and changing sustainability agenda.

This potential was recognised by
the UN Rio Earth Summit[204] and
Agenda 21[205] and since then a number
of national and state strategies have
included sustainability objectives for
the VET sector. For example in 1992
the Australian '*National Strategy for
Ecologically Sustainable Development*'[206]
included an objective to develop and
improve vocational education and
training programs which incorporate
ecologically sustainable development

principles and give practical skills
in achieving ecologically sustainable
development. '*Learning for Sustainability*'
the NSW Government's EE Plan
2002-2005 also outlines a strategy and
associated action for industry and VET
collaboration on the integration of
sustainability (see Box 4.71).

It is therefore somewhat surprising that a
recent national workshop on '*Educating
for a Sustainable Future*' found that the
absence of sustainability was 'all too clear'
in training packages[207].

Environmental Content
Certainly there are a number of Training
Packages that address segments of
the 'environmental industry' such as
NWP01 Water Industry and RTD02
Conservation and Land Management[208].
There are also environmental
Competency Standards[209] as part of other
Training Packages. For example, Business
Services Training Australia, with support
from the Victorian Government's
Department of Sustainability and
Environment and EPA Victoria, has
released a set of six environmental
Competency Standards as part of the
new Business Services Training Package[210]
recognising that there are environmental
issues in all aspects of business
administration and management.

However it would appear that some
National Training Packages include
environmental content that is irrelevant
to the particular industry sector - for
example a unit of competence dealing
with environmental issues in the same
Business Services Training Package refers
to the management of environmental
hazards and risks with little reference
to more relevant opportunities for
minimising environmental impact in the
office such as green procurement and

efficient use of resources[211]. Furthermore a gap analysis of environmental content in ten National Training Packages found that some packages only go as far as addressing legislative compliance and do not therefore encourage industry to implement voluntary initiatives that go beyond compliance[212].

There is obviously a growing list of standalone environmental units of competence, but as many are elective units they can easily be ignored[214]. The number of VET courses focusing entirely on ecological sustainability is also growing – for example one of TAFE NSW's newest courses is a graduate certificate in Ecologically Sustainable Development (see Box 4.72). Although this is a positive sign that demand is increasing, only a small proportion of VET learners currently enrol in these courses and they are usually those already familiar with sustainability principles and practice.

Holistic Integration

If VET is to support the implementation of sustainability into work practices of industry it is necessary to integrate sustainability into the existing units of competence across all industry sectors[215]. This is in line with the findings of a study into Western Australian '*Environmental Management Training Needs*' that the predominant attitude favours training that supports the greening of jobs rather than the creation of green jobs[216].

In the UK, Forum for the Future promotes the integration of *sufficient* sustainability knowledge and skills into all VET courses so that over a period of time all learners become sustainability literate and competent to decide and act in a way that favours sustainable development[217]. However current practice in Australia appears far removed from this ideal – according to one commentator, learners in VET are rarely, if ever, exposed to the concept of sustainability and its relevance to their future roles in industry and the community[218].

Teacher Development

This suggests a need for the professional development of *all* teachers, not just those teaching environmental courses, which goes further than the recommendation for action in '*Learning for Sustainability*' the NSW Government's 3-year EE Plan (see Box 4.73).

TAFE NSW's Environment Group identified the same need and in 2003 it developed a package of materials for use by program managers, educational staff and teachers to assist the integration of environmental content into curriculum development and teaching[219]. These materials include a tool outlining the depth of environmental knowledge or skills to be expected at each of the 6 Australian Qualifications Framework (AQF) levels, suggestions for generic environmental impact content and a list of existing environmental units of competence with an analysis of the adequacy of each[220].

However this concentration solely on environmental issues does not promote the holistic approach required for sustainability, otherwise known as the 'at the same time' rule[221] (see Box 4.74). In order to apply this rule, learners need not only to understand the different environmental, social and economic dimensions, but also to be equipped with the personal skills, such as values clarification and 'critical' thinking, that empower them to make informed decisions for the future. There is evidence that this is happening informally at least. Under the auspices of the '*Conversations for the 21-st Century*' initiative, one TAFE Sustainability Officer arranged weekly lunchtime sessions 'to engage students in thinking about sustainability and what this might mean to them personally and how their personal actions supported sustainability or otherwise'[222].

The Australian National Training Authority (ANTA) doesn't specifically discuss learning *for* sustainability skills, but it does emphasise the need for transferable 'generic' or 'employability'

■ **Box 4.72**
Graduate Certificate in Ecologically Sustainable Development (ESD)[213]

'This course is for people who want to acquire the knowledge and skills that relate to environmental management and sustainability functions within an organisation. It aims to meet the ESD requirements of a range industry sectors, from the scientific based to service industries such as real estate and tourism. You will learn how to apply ESD principles to enable you to understand the environmental legislative framework, effectively engage the community in the environmental decision-making process and improve sustainable organisational practices. This course will provide professional and para-professional environmental practitioners and others (e.g. managers, consultants, community leaders) with the tools to further their career in environmental and sustainability management.'

TAFE NSW (2004)

■ **Box 4.73**
VET and EE in NSW

'Action 46: VET providers to ensure the appropriate training of individuals delivering vocational education and training programs with environmental content.'

NSW Government (2002, p.38)

■ **Box 4.74**
The 'At the Same Time' Rule

'If the objective is to make thinking and acting sustainably a normal part of everyday life at home and at work, then everyone needs to be sustainability literate and relevant provision needs to be integrated into the content and delivery of all courses in all disciplines. This implies developing the capacity of all learners to apply what we have called the 'at the same time' rule. Whatever specialist discipline is being offered by a course, the learner should learn how to analyse issues and choices from an environmental, social and economic perspective at the same time, rather than separately.'

Higher Education Partnership for Sustainability (2004, p.18)

■ **Box 4.75**
Innovation at Work Skills[223]

The Innovation at Work Skills (IWS) system is a set of competency standards designed to provide both the skills and a process for developing and managing the systematic generation and development of ideas. The core standards are:

- ICS1 Contribute to workplace improvements
- ICS2 Share ideas in the workplace
- ICS3 Develop innovative ideas at work
- ICS4 Originate and develop a concept
- ICS5 Lead a team to foster innovation
- ICS6 Create an innovative work environment
- ICS7 Set up systems that support innovation

■ **Box 4.76**
Indigenous VET Provision

'Vocational education and training will help increase employment and business development opportunities for Indigenous people and communities, providing a foundation for greater economic independence. Vocational education and training will be enriched through an exchange of learning culture. Indigenous people will be enabled to create and adapt vocational education and training products and services in order to exercise their rights to positive learning environments for their communities.

Key performance measures:

- The extent to which Indigenous Australians engage with and achieve positive outcomes from vocational education and training.

- The number of Indigenous Australians who do vocational education and training each year and the number of qualifications, competencies and modules they attain.

- The proportion of Indigenous vocational education and training students who improve their employment circumstances or continue on to further study, after completing training, or who perceive that they have gained benefits from completing their training.

- The proportion of the vocational education and training workforce who identify as Indigenous.'

Australian National Training Authority (2003)

skills[224]. Employability skills are defined as 'skills required not only to gain employment, but also to progress within an enterprise so as to achieve one's potential and contribute successfully to enterprise strategic directions'[225]. One of these employability skills focuses specifically on innovation (see Box 4.75) which is critical for industry progression towards sustainability.

On a different level, the integration of sustainability into the content and delivery of all VET courses and disciplines needs to be done in the context of an institution with a clear strategic approach to sustainability in the way it manages its own resources and engages with its stakeholders. Few trainees will take their own sustainability literacy seriously if their campus does the opposite[226].

One institution, Swinburne, is moving towards establishing an ISO 14001 compliant EMS, starting with a review of its Hawthorn campus involving both staff and students. The project will also produce case study material for courses[227] and therefore provide trainees with the practical experience when implementing environmental programs with current or future employers.

This type of activity is encouraged in NSW by the Department of Education and Training (DET) through its '*Environmental Management Strategy*' which provides a framework for action and reporting on environmental priorities every 12 months by all schools, TAFE NSW Institutes, State Office Units, Educational Services Divisions and other DET business units. These priorities cover both teaching and operations – on the operations side they include paper, toner cartridges, construction and demolition waste, vegetation and energy[228].

Equity of Access for Diversity
VET providers also need to consider their social impacts and their role in advancing sustainability by ensuring equity of access to education and training. This is

in line with current corporate thinking that recognises the benefits of employing a diverse workforce as a stimulus for innovation[229].

In Australia, one of the four key objectives of ANTA's '*National Strategy for VET 2004-10*' focuses on Indigenous Australians and provides a number of key performance measures (see Box 4.76). In 2003 ANTA carried out a review of Training Packages and asked how they could serve Indigenous communities better along with people from Non-English Speaking Backgrounds and those with disabilities[230]. ANTA also aims to encourage more mature students and women.

At the institutional level, Swinburne runs a 'Partnership for Indigenous Training & Research' to undertake research on Indigenous VET provision within Australia and overseas, to identify current and emerging training needs of Indigenous students, workers and communities and to develop culturally-appropriate curriculum and delivery models[231].

In line with the belief that education is mainly preparation for economic life[232] VET in Australia has to date regarded environmental sustainability as specific technical, task-oriented skills[233] relevant only to a minority of students. This is not aligned with the view of learning *for* sustainability promoted by leading practitioners and thinkers. To affect this type of change in industry and beyond, the VET sector needs to employ a more balanced and holistic approach for all students, which considers the many facets of sustainability, including social issues, and builds their capacity for action. This in turn will require less emphasis on a framework based on notions of 'teaching' and more on the learning process itself[234].

viii) Formal Education for Business – Contributions from the University Sector

Business executives are often trained for business and management skills through University education. The Master of Business Administration (MBA) degree is probably the world's best known and most well recognised postgraduate degree that equips business executives with the pre-requisite skills for their career.

The MBA is a professional qualification, in that it is intended for those who work in all aspects of business and management regardless of industry or sector. The degree traditionally provides general and specialist curriculum in core areas such as accounting and finance, economics, organisational behaviour, marketing, general and strategic management and human resource management. Adopted in Australia from the United States in the 1960s (see Box 4.77) the MBA has gained popularity from its ability to attract a premium in the labour market[235].

Given its prominence, the MBA therefore has a critical role to play as a vehicle for the delivery of curriculum that can build capacity for sustainability in the business and industry sector. Business Schools can assist with the shift towards sustainability by providing education, capacity building as well as leadership in sustainability across a range of business sectors[236].

It is important to reflect on the pre-requisite skills that have become apparent over the last 10-15 years as necessary to build capacity in business executives so they can assist with

the shift toward sustainability. Since the emergence of Agenda 21[237] and the World Summit for Sustainable Development[238] it is understood that sustainability is a process of adaptive management and systems thinking, requiring creativity, flexibility and 'critical reflection'[239]. Through teamwork – 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 to the future.

Critical to learning for sustainability approaches is learning how to motivate and manage change towards sustainability within organisations[240]. Education *about* sustainability focuses on addressing the subject matter of sustainable development, aspects generally categorised under the Triple Bottom Line headings of environment, social and economic.

A review of literature (see Box 4.78) identifies some barriers associated with current MBA degrees and their ability to deliver education *about* and *for* sustainability. There is a belief held by some that the MBA is a program resistant to change. That, rather than preparing leaders for sustainability, it actually delivers technical and functional specialists who do not have the ability to extend or sustain the change towards sustainability.

A study undertaken for the Australian Government Department of the Environment and Heritage by ARIES[242] identified that internationally,

■ **Box 4.77**
Master of Business Administration

'In Australia, MBA programs have been offered since early 1960's, first at the University of Adelaide, University of Melbourne and University of New South Wales. Australian MBA curriculum has been adopted and adapted from American business school MBA programs perhaps indicating that a unique Australian perspective of management education does not underpin the curriculum.'

Benn and Bubna-Litic, (2003, p.2)

■ **Box 4.78**
Barriers to Sustainability

'The MBA continues to produce functional specialists drilled in analytical decision-making rather than the collaborative, worldly and reflective managers needed to provide leadership and foster success in today's business environment.'

Mintzberg and Gosling (2002) in Benn and Bubna-Litic (2004, p.3)

■ **Box 4.79**
'Education about and for Sustainability in Australian Business Schools'[241]

This study was undertaken by Macquarie University and Arup Sustainability for the Australian Government and benchmarked Australian Business Schools against leading international Business Schools. The results of the study identified that there were no 'leading edge' MBA programs offered by Australian Business Schools.

■ **Box 4.80**
**Criteria for Assessing
Contribution of Business Schools
to Learning for Sustainability**[243]

Criteria that must be demonstrated by
'Leading Edge' Schools:

● The MBA program is a) specialised in
relation to sustainability *or* b) has a
considerable number of core and elective
courses based on education *about* and *for*
sustain ability.

Plus at least five further criteria must be
achieved of the following:

● The Business School includes staff who
have teaching and/or research expertise in
the area of learning for sustainability.

● Staff and senior management recognise
the importance of developing sustainability
knowledge and skills amongst business
graduates.

● Students have the opportunity to address
sustainability through their assignments.

● Students are encouraged to construct their
own understanding of sustainability across
the program.

● Students would develop skills in areas
considered important to the understanding
and implementation of strategic change
toward sustainability such as of 'critical
reflective thinking', systemic thinking,
change management, stakeholder
engagement, futures thinking.

● Extracurricular and student-initiated
activities on sustainability such as
conferences, seminars, would be offered as
part of the curriculum.

● Key industry stakeholders in the area of
sustainability are significantly involved in
framing the MBA curriculum.

● The Business School offers short courses on
sustainability for those who cannot
commit to an MBA.

several university business schools have
been recognised as offering 'leading
edge' MBA programs that integrate
education *about* and *for* sustainability
within them (see Boxes 4.79 and 4.80).
These MBAs are characterised by
integrative core subjects which address
sustainability in the context of business
curriculum and learning which
integrates skills of 'critical' and strategic
thinking, scenario building and
stakeholder management. The majority
of these 'leading edge' business schools
also conduct extensive research into
sustainability carried out by faculty
for the benefit of students, informing
curriculum and offering education and
services to businesses and industry.

Examples include the MBA in Business
and Sustainability offered by the
Schulich School of Business at York
University in Canada[244], the MBA in
Corporate Environmental Management
developed by the School of Business
and Economics at the University of
Jyvaeskylae in Finland[245] and the MBA
in Sustainable Enterprise offered by
Kenan-Flagler School of Business at
the University of North Carolina in the
United States. Other institutions not
associated with universities, such as the
Bainbridge Graduate Institute[246] in the
United States, also offer leading edge
MBA programs – in this case an MBA
in Sustainable Business.

Unfortunately, there is currently no
specialised sustainability MBA program
in Australia. There are also no core
sustainability courses in postgraduate
business education. Although
environmental or social sustainability
themes do feature in elective subjects in
Australian MBA degrees, these subjects
do not develop the skills needed to
empower graduates for strategic change
towards sustainability. There are,
however, examples of good practice
in Australia. These include the MBA
offered by the Australian Maritime

College in Tasmania, which
integrates sustainability specifically into
the management of marine resources,
and the University of Technology in
Sydney, which as well as offering a
range of elective courses specifically
designed to address the content areas
of corporate social responsibility,
sustainability, sustainable tourism
and governance, also manages the
'*Corporate Sustainability Project*' (see
Box 4.81).

MBA programs need to encourage
students to learn and practice skills
for understanding and implementing
change towards sustainability.
These skills and knowledge include,
for example, 'critical reflective
thinking', systemic thinking, change
management, stakeholder dialogue and
futures thinking. Several Australian
MBA programs offer optional subjects
which explicitly deliver these skills
through their curriculum such as the
'*Management Ethics*' core MBA subject
offered at the School of Business and
Government, University of Canberra
(see Box 4.83). Other programs such
as the Macquarie Graduate School of
Management MBA program, teach
'critical' thinking skills for general
management, but not in the context of
sustainability[248].

Australian MBA programs also include
extra-curricular activities such as at the
RMIT School of Management where
an elective subject entitled '*Corporate
Governance Concepts and Perspectives*'
includes guest speakers, interactive
workshops, class discussions and
conferences as part of the activities[249].

The findings of the Australian Business
School Study[252] identified that the
main barrier to sustainability education
in Australian Business Schools is a lack
of student demand for such courses
but also that there was a general lack
of dialogue between the Business

Schools and industry to help inform curriculum development. This leads to the conclusion that business needs in education *about* and *for* sustainability are not currently being met by the Business Schools. To supplement this finding, at an EE Summit '*Building Capacity for a Sustainable Future*'[253] held in Sydney in 2001, business and industry leaders spoke about the sustainability challenges they face and the difficulties of recruiting graduates with the necessary skills to address these needs. This resulted in ten key recommendations (see Box 4.83).

There are a number of actions that can be taken by Business Schools in order to improve the dialogue and interaction between themselves and industry to ensure that the needs of industry are met, such as:

- Invite industry representatives to form part of University Boards that inform curriculum development towards sustainability.

- Involve industry in delivering lectures and courses.

- Seek industry input into the development of real life case studies relating to business change toward sustainability.

- Seek industry placements for MBA students in sustainability focused organisations.

- Involve industry in external program/course reviews on a regular basis[254].

Given that student demand for sustainability courses is also low[255], there is a real need to raise the profile and benefits of MBAs oriented towards sustainability. It is unlikely that Universities will commit to developing new curricula until market research documents that there is a need for them. Industry could play an important role in promoting sustainability courses and increasing demand for opportunities in this area.

■ **Box 4.81**
UTS 'Corporate Sustainability Project'[247]

The UTS '*Corporate Sustainability Project*' was established within the Faculty of Business. The project aims to generate a cross-disciplinary understanding of how corporations can develop the skills, approaches and tools needed to better integrate environmental and social performance with key business objectives, and how to design and lead the change programs needed to make these shifts.

■ **Box 4.82**
EE Summit Recommendations[251]

1. Universities need to provide students with the *critical, creative and futures thinking* skills to develop innovative and alternative solutions to sustainability issues.

2. Universities need to provide students with the *action-oriented skills* needed to motivate, manage and measure change towards sustainability.

3. Universities need to provide students with the *interpersonal and intercultural skills* needed to redefine relationships amongst stakeholders.

4. Universities need to provide students with the confidence and skills to deal with *complexity and uncertainty.*

5. Universities need to review their curriculum to ensure the effective development and assessment of *generic skills* in learning for sustainability across all faculties.

6. Universities need *to involve a range of stakeholders* (including business and industry) in overseeing this curriculum review process.

7. Universities need to increase opportunities for students to learn through *engaging with real and specific problems* or tasks.

8. Universities need to develop and strengthen *partnerships with business and industry*.

9. Universities need to offer opportunities for *professional development of staff* in learning for sustainability.

10. Universities need to ensure that all graduates, regardless of specialism have opportunities to learn *about* and *for* sustainability.

■ **Box 4.83**
Management Ethics Course[250]

In the University of Canberra School of Business and Government MBA Program the subject '*Management Ethics*' aims to assist students to acquire and develop 'critical' thinking skills required for the successful practice of business within the framework of societal values. These skills include the ability to perceive the ethical implications of a situation, engage in sound moral reasoning and develop practical problem solving strategies.

4.3 Summary of Needs and Recommendations

In Australia, a range of Environmental Education initiatives are targeted at, and/or conducted by, business and industry. This document provides a review of Environmental Education in this sector and its contribution to sustainability in Australia. It forms part of a series prepared by the Australian Research Institute in Education for Sustainability (ARIES) for the Australian Government Department of the Environment and Heritage. The report consolidates experience of Environmental Education programs, as well as emerging trends in this area, so as to inform future work in this area.

There is still an inadequate body of knowledge about what effective approaches to Environmental Education looks like within the business and industry sector. VET and government compliance programs offer the most Environmental Education opportunities to industry personnel. Business Schools are beginning to recognise the need to shift towards learning for sustainability but often lack the skills, capacity or leadership to action change. In addition, many corporate organisations are also recognising the role of interaction with peers and other informal learning through sustainability networks and social functions.

While corporations are being encouraged to engage with sustainability, most Environmental Education resources and tools only disseminate information, rather than encourage the development of skills for action and strategic change. Many industry education initiatives offer technical training on environmental management, but they tend to have a limited scope and do not seek to redefine strategic directions or assist in defining alternatives to current organisational policy and practice towards sustainability.

A handful of progressive corporations are showing leadership by educating their own stakeholders *about* and *for* sustainability. These companies are starting to integrate education and training programs into their Corporate Social Responsibility (CSR) policies and sustainability reporting initiatives. Others are utilising approaches such as Life Cycle Analysis to increase dialogue amongst and between industries and generate organisational change whilst providing further opportunities in learning for sustainability and developing partnerships.

Currently Environmental Education in the industry sector tends to focus on the technical knowledge and skills required to perform certain environmental job functions and there are many examples of successful programs. However it is rare to find industry education programs that motivate or build the capacity of participants to reorient current practice for long lasting change for sustainability.

To strengthen their contribution to sustainability, Environmental Education initiatives need to:

- Provide opportunities to informally educate and engage senior executives in sustainability;

- Educate and train managers and employees across the organisation to develop the necessary skills and knowledge in aspects of sustainability; and most importantly,

- Promote organisational learning in relation to sustainability issues.

Recommendations

The research undertaken by ARIES has revealed a number of key needs in the areas of informal learning, product stewardship, educating stakeholders, resources and tools for change, beyond compliance education, environmental performance, as well as contributions from the VET sector and the University Sector. The following recommendations have been derived from these key needs. The recommendations identify practical steps at a policy, practice and research level that could strengthen the contribution of EE towards sustainability within the business and industry sector.

Policy:
1. Government policy should:

a. Recognise that Environmental Education initiatives focused on compliance, environmental performance and product stewardship need to be more **closely aligned with learning for sustainability**;

b. Encourage a shift away from the development of prescriptive tools and resources to ones which build **motivation and capacity** for long-term change;

c. Recognise and support the role of **informal learning**;

d. Support corporate organisations which seek to **educate stakeholders** on sustainability; and,

e. Strengthen recognition of sustainability by formulating a specific **corporate Action Plan** for learning for sustainability.

Practice:

2. Fund a 6-month **mentoring program for government staff** responsible for designing and delivering business education and training initiatives. The program would consist of a series of one-day workshops, which would bring government staff together and deliver tailored workplace visits that focus on individual/program needs.

3. Provide incentives (such as matching funds and evaluation training) for corporate organisations to **evaluate and learn from their education and training experiences**. This would help them assess the impact of their current programs and consider ways of improving their management and performance concerning sustainability.

4. Enlist professional learning for sustainability educators to **mentor managers** from corporate organisations responsible for developing corporate stakeholder education programs.

5. Provide support, in the form of training or other resources, to **facilitators of informal networks** in order that they are able maximise the learning opportunities for participants.

6. Identify and categorise **existing opportunities for informal learning** for sustainability across Australia and make this information available to companies and their employees through a public resource. This resource would also encourage companies to set up internal sustainability networks and to participate in external **networks**.

7. **Identify and categorise** the sustainability **resources and tools** available to business and industry in Australia and make this information publicly available.

8. Provide incentives for Business Schools to **involve industry stakeholders in MBA curriculum development and practice**. This may involve sustainability 'champions' in the delivery of lectures as well as in course planning and reviews and/or work placements with a focus on sustainability.

9. Provide opportunities for cross-institutional collaboration, which would aim to develop a **'leading edge' sustainability course** for business executives and managers.

Research:

10. Research and document **case studies of good practice** which can encourage organisations to invest in building capacity to address sustainability issues at a more systemic level and to collaborate with multiple stakeholders for their resolution.

11. Build relationships between **VET providers** and selected **industry sustainability leaders** to determine, through sector specific research, **employer needs** for sustainability.

12. Expand previous research into the environmental components of **National Training Packages** to identify social and other aspects of sustainability and therefore provide a more holistic picture of the sustainability education currently available.

13. Research and develop **core competency standards** in learning for sustainability as part of generic and employability skills offerings.

14. Involve **professional associations in needs assessment research** to provide incentives which encourage responsibility and ownership of product issues in all parts of industry, not just amongst technical specialists.

15. Fund **evaluation of selected resources** and tools for impact and effectiveness in order provide valuable lessons for future initiatives.

16. Encourage corporate organisations to engage in **dialogue with stakeholders** to determine their own learning for sustainability needs. This can be done by funding sector specific participatory needs assessments, which would involve a number of corporate organisations.

17. Fund action research within Business Schools to **incorporate sustainability into existing courses** and to develop **new core units** with a focus on sustainability.

18. Fund **longitudinal research** which would assess the **employment and careers of business students** educated for sustainability. This will help increase demand and strengthen the case for addressing learning *about* and *for* sustainability within Business Schools.

19. Investigate the **approaches taken to similar issues (like company OH&S)** to determine how government can most effectively foster cultural change for sustainability within organisations.

Endnotes

[1] Goldsmith and Samson (2002)

[2] For example: 53% of survey respondents rate Australian industry as
performing below average in corporate citizenship (Birch 2002), clear
downward trend in environmental performance amongst Australia's top
100 companies (Australian Conservation Foundation 2002), only 14%
of top 100 companies in Australia have prepared sustainability reports
(Stratos 2003)

[3] Some companies may refer to EE by other terms such as 'sustainable
development training'

[4] Origin Energy (2004)

[5] Hunter Water (2001)

[6] Global Reporting Initiative (2002)

[7] See: Box 4.40 for a description of this evaluation process

[8] Tilbury, Crawley and Berry (2005)

[9] Tilbury, Coleman and Garlick (2005)

[10] See: http://www.environment.nsw.gov.au/cee/conference.htm

[11] Tilbury and Cooke (2001)

[12] World Business Council for Sustainable Development (2004)

[13] Business Council of Australia (2001)

[14] Roome and Oates (1996)

[15] Department of the Environment and Heritage (2000)

[16] Government of Western Australia (2003)

[17] NSW Government (2002)

[18] Sustainable Development Education Panel (2003)

[19] Sustainable Development Education Panel (2002)

[20] Tilbury and Adams (2005); see also Welford (1995); Roome and Oates
(1996); Dunphy et al (2003)

[21] Tilbury, Crawley and Berry (2005)

[22] Roome and Oats (1996)

[23] Roome and Oats (1996)

[24] Dunphy et al (2003)

[25] Tilbury (2002)

[26] Tilbury (2002)

[27] Tilbury and Adams (2005)

[28] Tilbury and Adams (2005)

[29] Molnar and Mulvihill (2003)

[30] Molnar and Mulvihill (2003)

[31] Senge (1990)

[32] Sustainable Development Education Panel (2003)

[33] Cross (2003)

[34] Boud and Middleton (2003)

[35] This was the title of an article about informal learning by Grebow (2002)

[36] Cross (2003)

[37] Fuller et al (2003) quoting Colley et al (2003)

[38] Connolly (2004)

[39] Clarke and Roome (1999)

[40] Clarke and Roome (1999)

[41] Crawley (2004)

[42] See: http://www.ieaust.org.au/

[43] See: http://www.propertyoz.com.au/

[44] See: http://www.icaa.org.au/

[45] See: http://www.tec.nccnsw.org.au/member/tec/project_intros/gco.html

[46] Boud and Middleton (2003)

[47] Bessant et al (2003) quoting Hines (1994) and Kaplinsky et al (1999)

[48] Parliamentary Commissioner for the Environment (2004)

[49] Tilbury and Adams (2005)

[50] See: http://www.enviroaust.net/e4/

[51] Cross (2003)

[52] See: http://www.sustainabilitymonth.org/

[53] The Conference Board (2004)

[54] See: http://www.conference.australiangold.org.au/

[55] See: http://www.ecochicks.com/

[56] Dawe (2003) quoting Phair (2000)

[57] Maor and Hendricks (2001)

[58] Persaud and Lee (2002)

[59] Boud and Middleton (2003) quoting Hughes (2002)

[60] Fuller et al (2003)

[61] See: http://www.bml.csiro.au/SNabout.htm

[62] See: http://www.accalliance.asn.au/

[63] See: http://www.sustainability.org.au/

[64] Bessant et al (2003)

[65] Bessant et al (2003)

[66] Persaud and Lee (2002)

[67] Clarke and Roome (1999)

[68] Maor and Hendricks (2001) quoting Bonk & Cunningham (1998)

[69] Roome (2001)

[70] Clarke and Roome (1999)

[71] Fuller et al (2003)

[72] Siemens (2003)

[73] EcoRecycle Victoria (2004a)

[74] University of Sydney (2004)

[75] UNEP (2004)

[76] UNEP (2004)

[77] Department of the Environment and Heritage (2004)

[78] EcoRecycle Victoria (2004)

[79] Department of the Environment and Heritage (2004)

[80] BIEC (2000)

[81] See: http://www.deh.gov.au/industry/waste/covenant/

[82] Environment Canada (2001)

[83] EcoRecycle Victoria (2004a)

[84] Environment Canada (2001)

[85] EPA Victoria (2004)

[86] Smith (2003)

[87] Pirnie (2004)

[88] University of Sydney (2004)

[89] Dunphy et al (2003); Hawken et al (1999)

[90] LISA (2004)

[91] World Resources Institute (2001)

[92] Welford (1995)

[93] Heiskanen (2000)

[94] Heiskanen (2000)

[95] Fineman (1997)

[96] BP (2002); Westpac (2002)

[97] General Motors (2003)

[98] NEC (2004)

[99] Honda (2003); Hirayama (2003)

[100] General Motors (2003)

[101] Wingerter (2000)

[102] General Motors (2003)

[103] General Motors (2003)

[104] Tilbury and Henderson (2003)

[105] Holden (2004)

[106] Pacific Northwest Pollution Prevention Resource Center (2004)

[107] Canning and Hanmer-Lloyd (2001)

[108] Pacific Northwest Pollution Prevention Resource Center (2004)

[109] Pacific Northwest Pollution Prevention Resource Center (2004)

[110] National Environmental Education and Training Foundation (2000)

[111] Graham Brown and Associates (2004)

[112] Chouinard and Brown (1997)

[113] Skinner (2004)

[114] Insurance Australia Group (2004)

[115] Insurance Australia Group (2004)

[116] Barclays (2002)

[117] Tilbury and Adams (2002)

[118] Holden (2004)

[119] Holden (2004)

[120] Tilbury and Podger (2004)

[121] Department of Education, Science and Training (2004)

[122] Wingerter (2000)

[123] Department of Education, Science and Training (2004)

[124] Farrell (2004)

[125] Dunphy et al (2003)

[126] Dunphy et al (2003)

[127] See: http://www.accaglobal.com/sustainability/awards/asra/2003_
archive/2003_winners/

[128] Westpac (2002)

[129] Westpac (2004)

[130] Deakin University (2004); Royal Melbourne Institute of Technology
(2004); University of Technology Sydney (2004)

[131] BP (2002)

[132] Tilbury et al (2003)

[133] General Motors (2003)

[134] Global Knowledge Ventures (2004)

[135] International Finance Corporation (2004)

[136] Ethical Investment Association (2004)

[137] Global Reporting Initiative (2003)

[138] See: http://unepfi.net

[139] Sustainable Asset Management (2004)

[140] Grey (2004)

[141] Tilbury and Adams (2005)

[142] See: http://www.stakeholderengage.com

[143] Tilbury and Adams (2005)

[144] Carolin (2004)

[145] Department of the Environment & Heritage (2002)

[146] Tilbury and Adams (2005)

[147] Department of Family & Community Services (2003)

[148] Australian Greenhouse Office (1999)

[149] Trewin (2004)

[150] Tilbury and Adams (2005)

[151] See: http://www.epa.vic.gov.au/Sustainability_Covenants/default.asp

[152] See: http://www.reputex.com.au

[153] New Zealand Business Council for Sustainable Development (2003)

[154] Crawford and Longfield (2004)

[155] See: http://www.cre8ive.com.au/barton/

[156] House of Representatives Standing Committee on Environment and
Heritage (2003)

[157] Mays (2003)

[158] Nolan ITU (2004)

[159] Trewin (2004)

[160] Smith (2003)

[161] Mainly the Environmental Departments

[162] Annandale et al (2004)

[163] Mitchell (2004)

[164] See: http://www.epa.vic.gov.au/industry/accredited_licences.asp

[165] See: http://www.ferret.com.au/articles/aa/0c027caa.asp

[166] Hunter Water (2000)

[167] Roome and Oates (1996); Dunphy et al (2003); Condon (2004);
Trewin (2004)

[168] Carolin (2004)

[169] Canon (2000)

[170] Olsson and Thomas (1998); Annandale et al (2004)

[171] Western Australia Sustainable Industry Group (2003)

[172] Dunphy et al (2003)

[173] Smith (2003)

[174] EPA Queensland (2004)

[175] Trewin (2004)

[176] Johnson (2000)

[177] Andreasen (1994)

[178] Robottom and Hart (1995)

[179] Schley and Laur (1998)

[180] Pears (2000)

[181] Smith (2003)

[182] Springett (2003)

[183] EPA Queensland (2004)

[184] EPA Queensland (2004)

[185] Collaborative Research Centre for Waste Management and Pollution
Control (2004)

[186] National Environmental Education and Training Foundation (2000)

[187] Molino Stewart (2004)

[188] Sinclair Knight Merz (2004)

[189] Dunphy et al (2003)

[190] Tinsley (2002)

[191] Roome and Oates (1996)

[192] EPA Victoria (2003)

[193] EcoRecycle Victoria (2004b)

[194] Tinsley (2002)

[195] Robert and Anderson (2002)

[196] UNEP (2004)

[197] Sterling (2001); Smith (2003)

[198] Australian National Training Authority (2003)

[199] Vocational Education and Training (VET) refers to post-secondary
school education and training outside of universities - it is delivered
by Technical and Further Education (TAFE) colleges, Adult and
Community Education (ACE) providers and other Registered Training
Organisations (RTOs) and overseen by the Australian National Training
Authority (ANTA)

[200] Anderson (2003)

[201] Foreword by Julie Buckley, Director TAFE NSW Primary Industries and
Natural Resource Division, to Russell (2003a)

[202] Government of Western Australia (2003)

[203] NSW Government (2002) p30

[204] See: http://www.un.org/geninfo/bp/enviro.html

[205] UNESCO (1992)

[206] Department of the Environment and Heritage (1992)

[207] Anderson (2003) quoting Barrow and Condon (2002)

[208] Peterson (2004)

[209] Competency standards are statements of the skills, knowledge and
attitudes expected of people in various positions and roles in the
workplace

[210] Business Services Training Australia (2002)

[211] Russell (2003a)

[212] Russell (2003a)

[213] See: http://www.tafensw.edu.au/courses/courses/welcome.htm

[214] Russell (2003a)

[215] Russell (2003a)

[216] Green Skills (2002) quoting Western Australian Environmental
Management Training Needs Research (1997)

[217] Higher Education Partnership for Sustainability (2004)
[218] Anderson (2003)
[219] Russell (2003b)
[220] Russell (2003b)
[221] Higher Education Partnership for Sustainability (2004)
[222] See: http://www.conversations.com.au/c21c/tafesust.htm
[223] Australian National Training Authority (2004)
[224] Australian National Training Authority (2003)
[225] Australian National Training Authority (2004)
[226] Higher Education Partnership for Sustainability (2004)
[227] Aumann (2003)
[228] NSW Department of Education and Training (no date)
[229] Weiser and Zadek (2000)
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[256] The review does not seek to dissect the EE experience into isolated parts, instead, it identifies key 'hooks' that help us hang the experience of what is happening within the business and industry education sector. These themes do not identify the outcomes or impact of EE in the business and industry education sector since this is beyond the scope of the report. Empirical evaluation and longitudinal research is required to identify the achievements and changes resulting from EE.

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Glossary

- **Action Research**

Action Research can be used as a collaborative research tool, which is often represented as a four-phase cyclical process of critical enquiry – plan formation, action, outcome observation and reflection. It aims not just to improve, but to innovate practice. Action Research provides a valuable process for exploring ways in which sustainability is relevant to the researchers' workplaces and/or lifestyles. It views change as the desired outcome and involves participants as researchers of their own practice. In this way Action Research produces more than just a research document. It results in catalytic change for sustainability. Its focus on critical enquiry and continuous self-evaluation makes it a useful tool for professional development in Environmental Education. 'Critical' Action Research aims to change systems and to embed change in practice.

- **Cleaner Production**

Cleaner Production is the international term for reducing environmental impacts from processes, products and services by using better management strategies, methods and tools. Cleaner production means the continuous application of an integrated preventive environmental strategy to processes and products to reduce risks to humans and the environment. For production processes, cleaner production includes conserving raw materials and energy, eliminating toxic raw materials, and reducing the quantity and toxicity of all emissions and wastes before they leave a process. For products, the strategy focuses on reducing impacts along the entire life cycle of the product, from raw material extraction to the ultimate disposal of the product. Cleaner production is achieved by applying know-how, by improving technology, and by changing attitudes.

- **Community Education**

Community Education programs are taken to refer to all education programs which fall outside of the school, further and higher education sectors. For further information refer to Volume 3 and 5 in this series.

- **Corporate Citizenship**

Corporate citizenship refers to the way a company leverages their social, economic and human assets. When a company uses its assets to bring about measurable gains not only for itself, but for society as well, that company is acting as a good corporate citizen. A good corporate citizen integrates basic social values with everyday business practices, operations and policies, so that these values influence daily decision-making across all aspects of the business. It takes into account its impact on all stakeholders, including employees, customers, communities, suppliers, and the natural environment. For further information refer to 'Corporate Social Responsibility'.

- **Corporate Social Responsibility (CSR)**

Corporate Social Responsibility is the decision-making and implementation process that guides all company activities in the protection and promotion of international human rights, labour and environmental standards and compliance with legal requirements. CSR involves a commitment to contribute to the economic, environmental and social sustainability of communities through the on-going engagement of stakeholders, the active participation of communities impacted by company activities and the public reporting of company policies and performance in the economic, environmental and social arenas. For further information refer to 'Corporate Citizenship'.

- **'Critical Theory'**

'Critical theory' is a philosophical framework that seeks to radically critique systems of knowledge and power. 'Critical theory' seeks to develop systemic changes as opposed to individual behaviour changes. It emphasizes the importance of engaging people in thinking critically and developing their own responses and actions to issues rather than imposing on them previously constructed actions. 'Critical theory' attacks social practices, which obstructs social justice, human emancipation and ecological sustainability. 'Critical theory' is what underpins education for sustainability approaches to Environmental Education. For further information see 'Critical Thinking'.

- **'Critical' Thinking**

'Critical' thinking is an essential part of learning for sustainability approaches to Environmental Education that challenges us to examine the way we interpret the world and how our knowledge and opinions are shaped by those around us. 'Critical' thinking leads us to a deeper understanding of the interests behind power and politics in our communities and the influences of media and advertising in our lives.

● **Education *about* the environment**

Education *about* the environment is the most commonly practiced approach in Environmental Education. It focuses on developing key knowledge and understanding about natural systems and and complex environmental issues as well as developing an understanding of the human interaction with these systems and issues.

● **Education for the environment**

Education *for* the environment moves beyond education in and about the environment approaches to focus on equipping learners with the necessary skills to be able to take positive action. The education *for* the environment approach promotes critical reflection and has an overt agenda of social change. It aims to promote lifestyle changes that are more compatible with sustainability. It seeks to build capacity for active participation in decision-making for sustainability. In practice, however, education *for* the environment is often interpreted as the involvement of learners in one-off events or individual actions (e.g. tree planting) although occasionally they can trigger greater change on a social level.

● **Education *in* the environment**

Education *in* the environment is an approach, which provides opportunities for learners to have direct experience in the environment and develop positive attitudes and values towards stewardship of the environment. The approach may foster a value-based environmental concern of the importance and fragility of ecosystems and landscapes. While ecological concepts may be taught through these explorations, the focus is on having positive experiences in a natural setting.

● **Eco-Efficiency**

Eco-Efficiency was coined by the World Business Council for Sustainable Development (WBCSD) in 1992 and defined as the delivery of competitively priced goods and services that satisfy human needs and promote quality of life, while progressively reducing ecological impacts and resource intensity throughout the life cycle, at least to a level in line with the earth's estimated carrying capacity. However, the concepts of Eco-Efficiency and Cleaner Production are almost synonymous. The slight difference between them is that eco-efficiency starts from issues of economic efficiency which have positive environmental benefits, while Cleaner Production starts from issues of environmental efficiency which have positive economic benefits.

● **Environmental Education**

Environmental Education within this series refers to the overall field of education which engages learners with their environments, be they natural, built or social. The range of practices and approaches to Environmental Education have evolved significantly since the term was first used in the late 1960s. Initially in the 1970s educators perceived Environmental Education as 'education *about* the environment' which focuses on developing knowledge and understanding (see glossary). Environmental Education then progressed to favour the approach of 'education *in* the environment' (see glossary) which promotes experiencing environment and issues. In the 1990s the practice of teaching 'education *for* the environment' emerged as a dominant force (see glossary) with its focus on participation and action to improve the environment. Currently within Environmental Education one can still find examples of all these approaches in practice. The most recent development in Environmental Education theory and practice is 'learning for sustainability'. This approach challenges current practice in several ways to achieve more systemic change towards sustainability (see glossary).

● **Environmental Management Systems (EMS)**

'An Environmental Management System (EMS) is that part of the overall management system which includes organisational structure, planning activities, responsibilities, practices, procedures, processes and resources for developing, implementing, achieving, reviewing and maintaining the environmental policy. An EMS provides order and consistency for organizations to address environmental concerns through the allocation of resources, assignment of responsibilities, and ongoing evaluation of practices, procedures and processes.'[a]

● **Envisioning and Futures Thinking**

Envisioning a better future is a process that engages people in conceiving and capturing a vision of their ideal future. Envisioning, also known as 'futures thinking', helps people to discover their possible and preferred futures, and to uncover the beliefs and assumptions that underlie these visions and choices. Envisioning offers direction and energy and provides impetus for action by harnessing peoples' deep aspirations which motivate what people do in the present.

● **Extended Producer Responsibility (EPR)**

Extended Producer Responsibility extends the traditional environmental responsibilities that producers and distributors have previously been assigned (i.e. worker safety, prevention and treatment of environmental releases

from production, financial and legal responsibility for the sound management of production wastes) to include management at the post-consumer stage.

● Learning for Sustainability

Learning for sustainability (also refered to as 'education for sustainability' or 'education for sustainable development') has crystallized as a result of international agreements and the global call to actively pursue sustainable development. It provides a new approach for current practice in Environmental Education. This new approach attempts to move beyond education in and about the environment approaches to focus on equipping learners with the necessary skills to be able to take positive action to address a range of sustainability issues. Learning for sustainability motivates, equips and involves individuals, and social groups in reflecting on how we currently live and work, in making informed decisions and creating ways to work towards a more sustainable world. This approach is underpinned by the principles of 'critical theory' (see glossary). Learning for sustainability aims to go beyond individual behaviour change or single actions often associated with education for the environment. It seeks to engage and empower people to implement systemic changes. For further information refer to Volume 1 of this series.

● Learning Organisation

A learning organisation is one which is based on the principles of adaptive management and uses these techniques within the workplace. It promotes exchange of information between employees hence creating a more knowledgeable workforce. This produces a very flexible organisation where people will accept and adapt to new ideas and changes through a shared vision. A learning organisation employs certain principles of learning for sustainability, such as envisioning, systems and 'critical' thinking to create an atmosphere of team learning and develop shared visions and systems thinking. A key component of a learning organisation is that it incorporates the principles of adaptive management.

Adaptive management is a systematic process for continually improving management policies and practices by learning from the outcomes of operational programs. Its most effective form ('active' adaptive management) employs management programs that are designed to experimentally compare selected policies or practices, by evaluating alternative hypotheses about the system being managed.

● Life Cycle Analysis (LCA)

Life Cycle Analysis is a technique for quantifying and assessing the inputs and outputs affecting environmental performance associated with a product throughout its life cycle from production, through use, to disposal. LCA can assist in identifying opportunities to improve environmental performance.

● Participatory Action Research (PAR)

Participatory Action Research is a collaborative process in which a group of co-researchers combine inquiry, 'critical reflection' and action. A main component of PAR is that there are no 'experts' and as such all of the group are involved equally in the processes of inquiry and problem solving. PAR seeks to breakdown the traditional hierarchies and power structures experienced between researcher and researched. It is the participants or 'researchers' that have control and ownership of the process, direction of research and ultimately the use of the results. The process has been used as a form of group Action Research that encourages more open communication and discussion amongst colleagues regarding a specific task or issue. The group Action Research process invites deeper 'critical reflection' and thinking about change. For further information refer to 'Action Research'.

● Product Stewardship

Product stewardship addresses the environmental impact of a product at all stages of its life cycle, from design, manufacturing, packaging and distribution through to end-of-life management. It shifts the responsibility for end-of-life management from the public sector (government and taxpayers) alone, to a shared responsibility that includes the private sector (manufacturers and purchasers). The goal is to encourage environmentally friendly design, recycling, and to reduce the flow to landfills. For further information refer to the related concept of 'Extended Producer Responsibility'.

● Socially Responsible Investment (SRI)

Socially responsible investment is the integration of social responsibility and sustainability with investment. It includes all the financial decision-making processes that are a part of a prudent investment management approach, but it also includes the selection and management of investments based on issues of sustainability or social responsibility. Socially responsible investing can be done by either individuals or institutions. For example: foundations, religious organisations, trusts, investment pools and pension plans.

- **Sustainability Focused Organisational Learning (SFOL)**
The term 'sustainability focused organizational learning' has been used to describe the experience of companies that are attempting to pursue sustainability or the triple bottom line while making substantial changes to their organizational cultures. For further information refer to 'Learning Organisation'.

- **Sustainable Development and Sustainability**
The idea of sustainability owes a great deal to the United Nations which in 1983 set up the World Commission on Environment and Development (WCED) and promoted quality of life for present as well as future generations. The key goals of sustainability are to live within our environmental limits, to achieve social justice and to foster economic and social progress.

Issues such as food security, poverty, sustainable tourism, urban quality, women, fair trade, green consumerism, ecological public health and waste management as well as those of climatic change, deforestation, land degradation, desertification, depletion of natural resources and loss of biodiversity are primary concerns for both environmental and development education.

The issues underlying 'sustainable development', or 'sustainability', are complex and they cannot be encapsulated within the diplomatic language and compromises. Sustainability is open to different interpretations and takes on different meanings not only between cultures but also between different interest groups within societies. Sustainability embraces equality for all, and for this reason a key aim of sustainability is to enable multi-stakeholder groups to define their vision of sustainability and to work towards it. For further information refer to Volume 1 of this series.

- **Systems Thinking**
Systems thinking is a type of thinking methodology based upon a critical understanding of how complex systems, such as environments and ecosystems, function by considering the whole rather than the sum of the parts. Systems thinking provides an alternative to the dominant way of thinking, which emphasizes analysis and understanding through deconstruction. In comparison, systemic thinking offers a better way to understand and manage complex situations because it emphasizes holistic, integrative approaches, which take into account the relationships between system components and works toward long-term solutions critical to addressing issues of sustainability. Systemic thinking offers an innovative approach to looking at the world and the issues of sustainability in a broader, interdisciplinary and more relational way. Closely related to holistic and ecological thinking, systemic approaches help us shift our focus and attention from 'things' to processes, from static states to dynamics, and from 'parts' to 'wholes'.

- **Triple Bottom Line (TBL)**
Triple Bottom Line is an expanded baseline for measuring performance, adding social and environmental dimensions to the traditional monetary yardstick. Reporting on the TBL is based on the premise that by monitoring and reporting social, economic and environmental performance, organisations can better prepare for future challenges and opportunities, including those traditionally considered intangible, such as reputation.

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[a] International Standard Organization (1995) Environmental Management Systems - Specification with Guidance for Use, ISO/DIS 1400.